STEWARDSHIP OF IMAGING:
OPPORTUNITIES FOR UROLOGISTS TO LEAD

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Disclosures

- Agency for Healthcare Research and Quality grant 1 R13 HS025664-01

- *Not directly related to presentation*:
  - Grant funding: Patient-Centered Outcomes Research Institute, National Cancer Institute
  - Consultant/Advisor: Grand Rounds

Everyone Loves Advanced Imaging

VALUE OF INNOVATION

Physicians' Views Of The Relative Importance Of Thirty Medical Innovations

A survey of leading general internists provides a useful consensus on the relative importance of innovations to their patients.

by Victor R. Fuchs and Harold C. Sox Jr.

- Mail survey to leaders* in general internal medicine
- *Senior (excluded medical school graduates after 1980)
- 73% response rate (n=274)

Health Affairs, 2001

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EXHIBIT 3
Mean Response And Ranking Of Physicians' Ratings Of Innovations, 2001

Rank	Innovation	Mean score[a]	Most	Not most or least	Least
1	MRI and CT scanning	0.878	75.6%	24.4%	0.0%
2	ACE inhibitors	0.797	54.2	44.9	0.9
3	Balloon angioplasty	0.758	53.8	44.0	2.2
4	Statins	0.736	48.0	51.1	0.9
5	Mammography	0.733	47.6	51.6	0.9
6	CABG	0.693	40.4	57.8	1.8
7	Proton pump inhibitors and H2 blockers	0.687	40.0	57.3	2.7
8	SSRIs and recent non-SSRI antidepressants	0.678	39.6	56.4	4.0
12	Gastrointestinal endoscopy	0.624	28.0	68.9	3.1
13	Inhaled steroids for asthma	0.591	23.6	71.1	5.3
14	Laparoscopic surgery	0.558	20.9	69.8	9.3
15	NSAIDs and Cox-2 inhibitors	0.531	14.2	77.8	8.0
16	Cardiac enzymes	0.498	7.1	85.3	7.6
17	Fluoroquinolones	0.487	6.7	84.0	9.3
18	Recent hypoglycemic agents	0.478	12.9	69.8	17.3
19	HIV testing and treatment	0.444	15.6	57.8	26.7
20	Tamoxifen	0.440	3.1	81.8	15.1
21	PSA testing	0.438	12.9	61.8	25.3
22	Long-acting and parenteral opioids	0.376	8.4	58.2	33.3
23	H. Pylori testing and treatment	0.351	1.8	66.7	31.6
24	Bone densitometry	0.344	4.0	60.9	35.1
25	Third-generation cephalosporins	0.329	1.8	62.2	36.0
26	Calcium channel blockers	0.291	1.8	54.7	43.6
27	IV-conscious sedation	0.289	1.8	54.2	44.0
28	Sildenafil (Viagra)	0.256	0.9	49.3	49.8
29	Nonsedating antihistamines	0.231	1.3	43.6	55.1
30	Bone marrow transplant	0.182	1.3	33.8	64.9
	All 30 innovations	0.520	22.3	59.6	18.2

Everyone Loves Advanced Imaging

- Advanced Imaging is Great

BUT

- Fastest increasing sector of service utilization
  - U.S. Annual CT scans: 3M (1985)→85M (2010)
  - Tripling in last 10 years
- 20-50% advanced imaging potentially avoidable
  - >$30 billion annually (Institute of Medicine, 2012)
- Over half of Choosing Wisely questions

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Medical-Imaging Stewardship in the Accountable Care Era

Daniel J. Durand, M.D., Jonathan S. Lewin, M.D., and Scott A. Berkowitz, M.D., M.B.A.

The NEW ENGLAND JOURNAL of MEDICINE

Lessons for Imaging Stewardship from the Centers for Disease Control and Prevention (CDC) Antimicrobial Stewardship Framework.

Element of CDC Antimicrobial Stewardship Framework	Imaging Stewardship Analogue	Implementation Steps
Leadership commitment: dedicating necessary resources	Making necessary investments and committing publicly to a cultural shift toward appropriateness and away from easy access to imaging	Endorse Choosing Wisely list items related to imaging; allocate budget for investments in information technology and nonclinical time
Accountability: appointing a single leader responsible for program outcomes	Appointing a single leader within each imaging specialty; establishing joint accountability among the multiple relevant specialties	Shift compensation away from volume-based metrics to include measures of imaging appropriateness
Drug expertise: appointing a single pharmacist leader for improving antibiotic use	Making imaging specialists responsible for executing appropriateness interventions	Designate stewardship champions (with formal roles and partial salary support) within each imaging department
Action: implementing recommended actions, such as systemic evaluation of ongoing treatment need after a set period of initial treatment	Implementing interventions to ensure systematic evaluation of appropriateness at the time of ordering and encouraging dialogue between referring physicians and imaging experts	Change the imaging-order workflow, through CDS, consultation with imaging specialists, or both
Tracking: monitoring antibiotic prescribing and resistance patterns	Monitoring imaging utilization and appropriateness scores for providers and tracking per-capita costs and radiation doses	Gather, and share with providers, data on ordering appropriateness for commonly overused exams
Reporting: regularly reporting information on antibiotic use and resistance to doctors, nurses, and relevant staff	Informing referring physicians about their imaging utilization rates and the best available measures of imaging appropriateness	Generate quarterly reports for physicians showing their ordering performance relative to that of their peers
Education: educating clinicians about resistance and optimal prescribing	Identifying key knowledge gaps on imaging appropriateness and educating referring physicians on relevant evidence-based guidelines	Request or require that ordering physicians review consensus guidelines on imaging relevant to their practice

THE NEW ENGLAND JOURNAL of MEDICINE

Durand DJ et al. N Engl J Med 2015;373:1691-1693.

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2017 AUA QI Summit: Challenges and Opportunities for Stewardship of Urological Imaging

- Advanced imaging services are critical to the care of urology patients, but these are under increasing scrutiny in the context of high utilization, rising costs, and a growing appreciation of harms from radiation exposure
- The AUA has been at the vanguard of efforts to promote imaging stewardship, participating in Choosing Wisely and other efforts
- Related activities in radiology (ACR) and emergency medicine (ACEP) intersect with the care of urology patients, in particular the large population with urinary stone disease

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American Urological Association

Fifteen Things Physicians and Patients Should Question

Released February 21, 2013 (1-5), June 11, 2015 (6-10) and May 13, 2017 (11-15); #5 sources revised May 9, 2016; #1 and #5 updated May 26, 2017

DOWNLOAD PDF

1 **A routine bone scan is unnecessary in men with low-risk prostate cancer.**

Low-risk patients (defined by using commonly accepted categories such as American Urological Association and National Comprehensive Cancer Network guidelines) are unlikely to have disease identified by bone scan. Accordingly, bone scans are generally unnecessary in patients with newly diagnosed prostate cancer who have a PSA <10.0 ng/mL and a Gleason score less than 7 unless the patient's history or clinical examination suggests bony involvement. Progression to the bone is much more common in advanced local disease or in high-grade disease that is characterized by fast and aggressive growth into surrounding areas such as bones or lymph nodes.

American Urological Association

Patient Materials

- Testosterone for Erection Problems
- Antibiotics for People with Catheters
- Search patient-friendly resources by Consumer Reports.

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MUSIC Michigan Urological Surgery Improvement Collaborative

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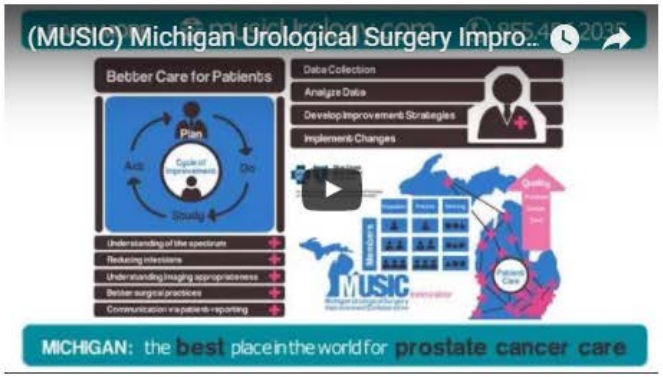
Improving outcomes for

UROLOGICAL CARE

MUSIC
Michigan Urological Surgery Improvement Collaborative
@MUSICUrology

Program Overview

The overall aims of the collaborative include, among others, evaluating and improving patterns of care in the radiographic staging of men with newly diagnosed prostate cancer, reducing biopsy-related complications and assessing repeat biopsy patterns, improving patient outcomes after radical prostatectomy, enhancing patient-centered decision making among men considering local therapy for early-stage prostate cancer, and understanding and reducing variation in the use of androgen deprivation therapy. Participating practices submit data to a clinical registry maintained by the MUSIC Coordinating Center and tri-annual consortium-wide meetings are held each year to discuss data, review risk-adjusted measures of processes of care and patient outcomes, and identify strategies and best practices for quality improvement.



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New! Patient Reported Outcomes | askMUSIC | Request Access | LOGIN

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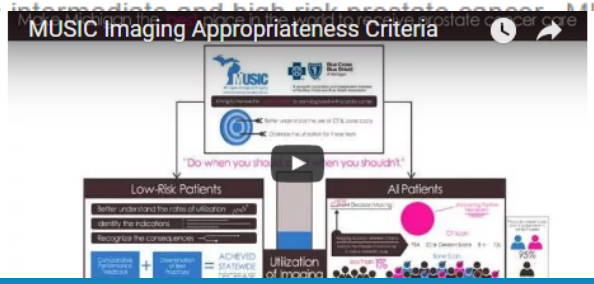
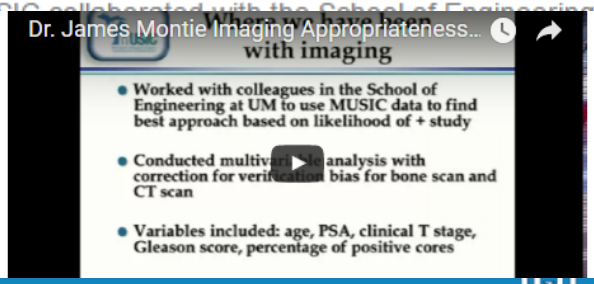
Radiographic Staging of Men with Newly Diagnosed Prostate Cancer

Optimizing imaging utilization for patients with newly diagnosed prostate cancer was one of the initial priorities for MUSIC. The goal was to better understand the current rates of utilization and ensure that imaging studies were being ordered for patients that could truly benefit from the tests.

Through the use of comparative performance feedback, review of current guidelines, and dissemination of best practices, MUSIC was able to achieve a statewide decrease in the utilization of both bone scans and CT scans for patients with low risk prostate cancer. In considering imaging utilization for patients with intermediate and high risk prostate cancer, MUSIC collaborated with the School of Engineering at the University of





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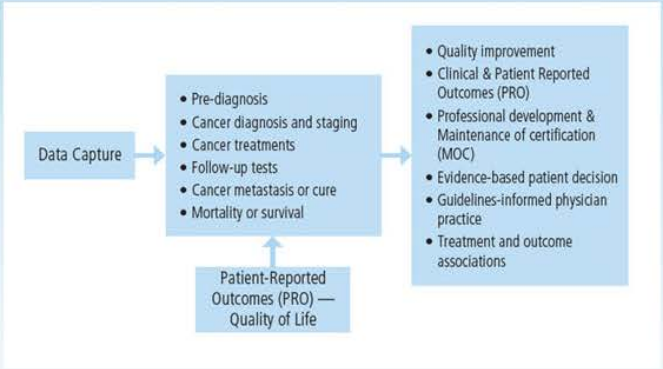
AUA Quality Registry (AQUA) Program Information

AQUA
AUA Quality Registry

A Physician-Friendly Disease Registry

The AQUA Registry is a physician-friendly registry that utilizes data extracted directly from an electronic health record (EHR). Patient information and clinical data are automatically extracted, transformed and loaded into the AQUA Registry from the practice sites' EHR systems, thus resulting in little data entry burden for participating physicians.



How AQUA Registry Data Will Be Used

National and comparative data generated by the AQUA Registry supports guideline-informed physician practice, and evidence-based decision support mechanisms. It also provides participating urologists feedback regarding their individual- and/or practice-level performance on a range of process and outcome quality measures,

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What is R-SCAN?

R-SCAN™ is a collaborative action plan that brings radiologists and referring clinicians together to improve imaging appropriateness based upon a growing list of imaging Choosing Wisely (CW) topics. R-SCAN delivers immediate access to Web-based tools and clinical decision support (CDS) technology that help you optimize imaging care, reduce unnecessary imaging exams and lower the cost of care. There is no cost to participate.

LEARN MORE > **PLEDGE TO JOIN >** **START YOUR PROJECT >**

A program of the ACR American College of Radiology — Quality is Our Image

Sponsored by TCPi Transforming Clinical Practice Initiative

Recent Announcements

Radiologists and referring clinicians fulfill "Improvement Activity" credits under MIPS

rscan.org

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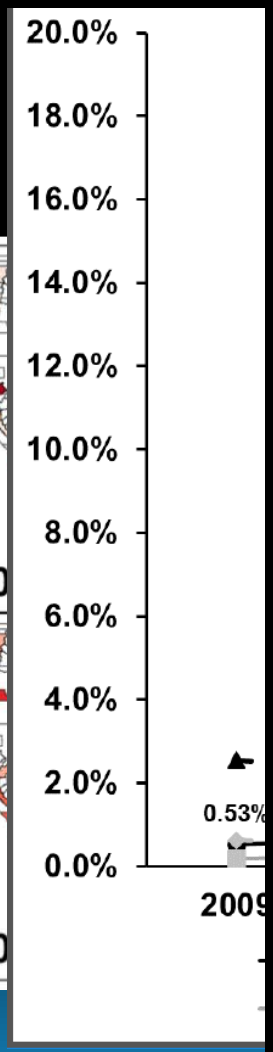
Dissemination of Prostate MRI

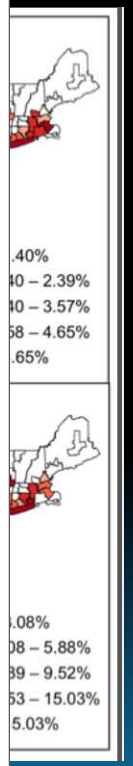
@chrisfilson



PI-RADS™

Prostate Imaging – Reporting and Data System

2015
version 2



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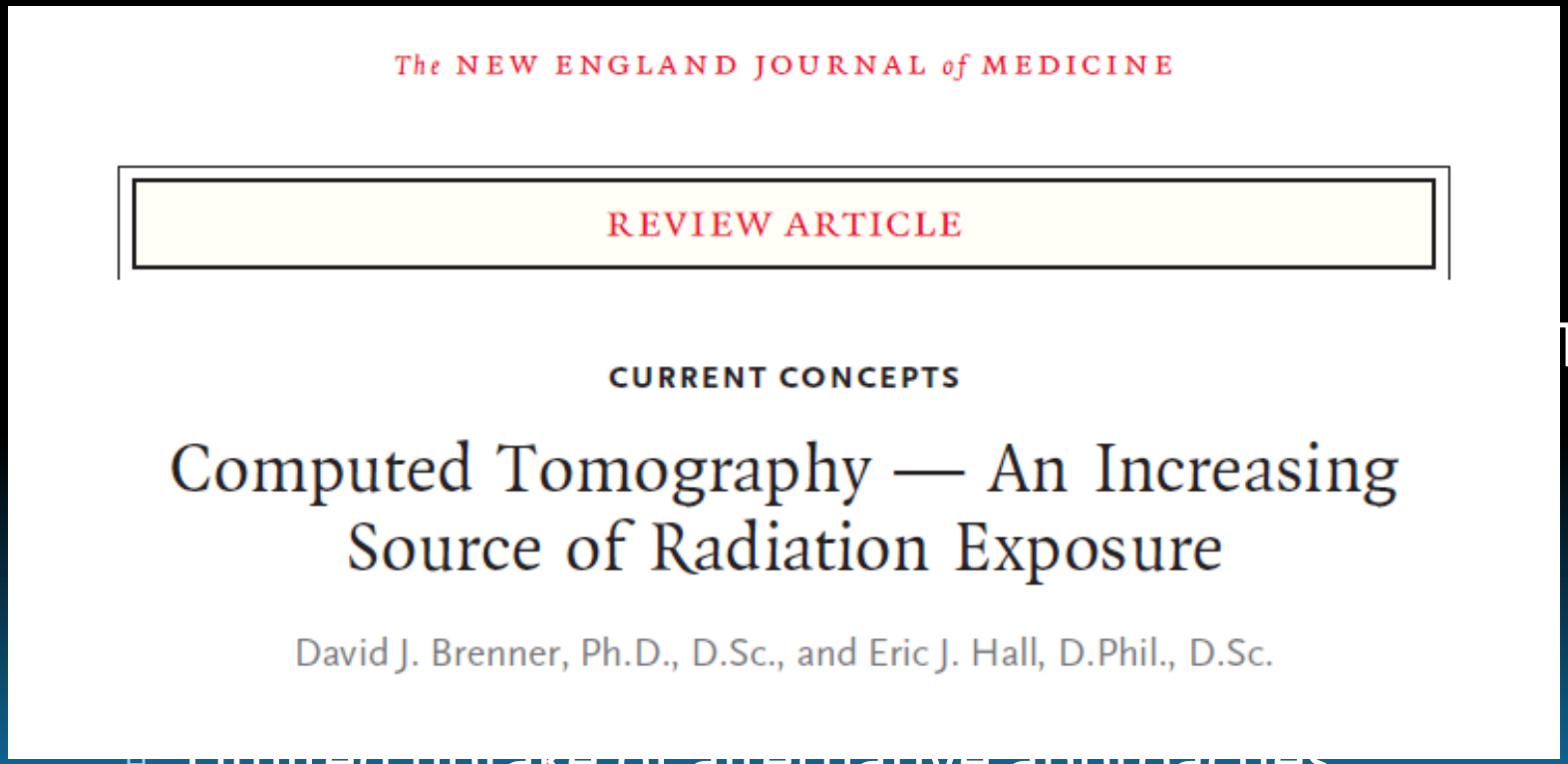
Radiation Harms

- Spectacular increase in CT volume (3M→85M)
  - Approximate tripling 1996-2010



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REVIEW ARTICLE

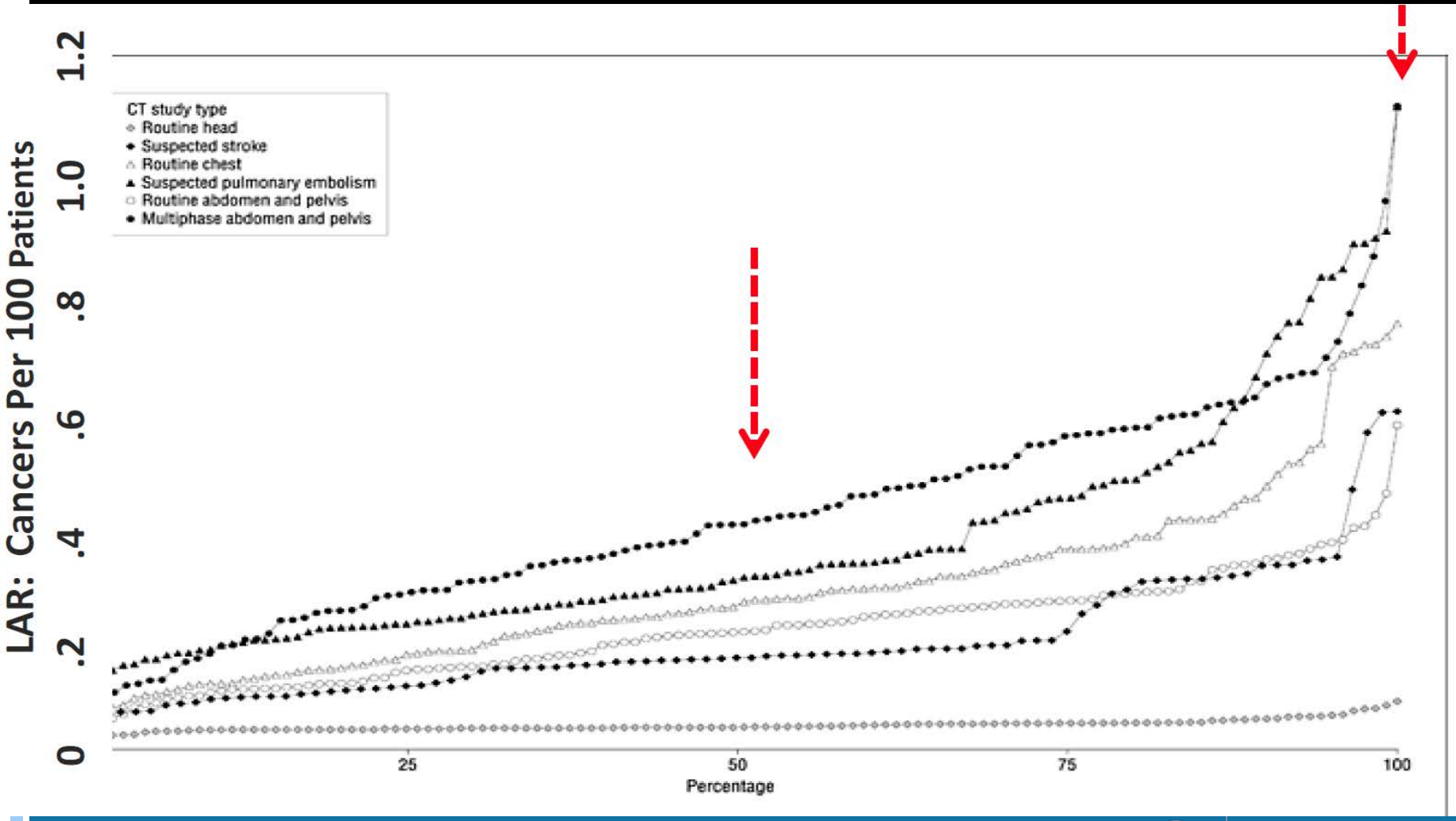
CURRENT CONCEPTS

Computed Tomography — An Increasing Source of Radiation Exposure

David J. Brenner, Ph.D., D.Sc., and Eric J. Hall, D.Phil., D.Sc.

- Limited uptake of alternative approaches

@UCRadSafety



Stone disease: the next mountain to climb

- Prevalence: 5.2% (1994)→ 8.8% (2010)
  - Recurrences in up to 50%
- Imaging central to most episodes of care
  - Microcosm of broader challenges for imaging stewardship
  - Huge opportunities to reduce radiation exposure/cost
- Logical context for cross-specialty collaboration
  - Acuity: 2 million ED encounters annually
  - Radiologists responsible for protocol implementation

{Radiologists/ED physicians actively engaged already}

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A microcosm of broader challenges

- Use of CT in ED kidney stone encounters
  - 21%→71% in past decade (10x increase)
  - No significant change in proportion diagnosed (stone vs alternate), admitted to hospital
- What about low-dose stone protocol CT?
  - Excellent sens/spec at doses as low as 1-3 mSv
  - Rarely implemented (<2%)
  - Wide variation→average dose: 1/1000 cancer risk

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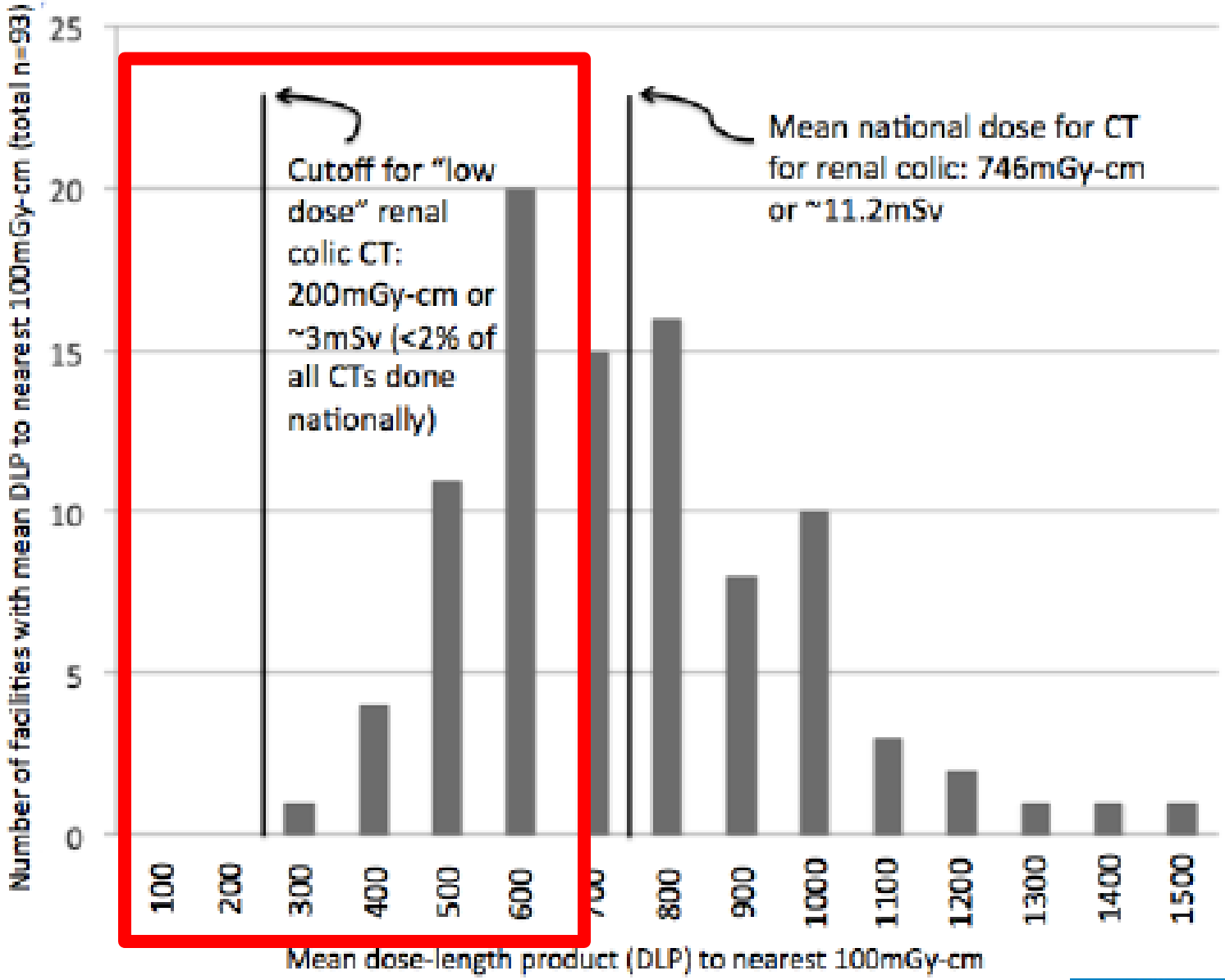

mSv

- 456 actively contributing CT dose data

Advancing Excellence in Health Care

DOSE/RadIQ

- RadIQ
  - Convenient, interactive online educational platform
  - Hands-on case review methods / teaching points
  - Dose optimization q&a (CME available)
  - Dose-optimized CT protocols by manufacturer/scanner
- Multimedia Educational module to enable best practices in Protocol and Radiation Optimization for CT (ME-PROC)
  - Compare size-specific dosing estimates (SSDE) for renal colic CTs in ME-PROC institutions vs nonparticipants in ACR DIR

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Dose Optimization for Stone Evaluation (DOSE)

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ORIGINAL ARTICLE

Ultrasonography versus Computed Tomography for Suspected Nephrolithiasis

R. Smith-Bindman, C. Aubin, J. Bailitz, R.N. Bengiamin, C.A. Camargo, Jr., J. Corbo, A.J. Dean, R.B. Goldstein, R.T. Griffey, G.D. Jay, T.L. Kang, D.R. Kriesel, O. J. Ma, M. Mallin, W. Manson, J. Melnikow, D.L. Miglioretti, S.K. Miller, L.D. Mills, J.R. Miner, M. Moghadassi, V.E. Noble, G.M. Press, M.L. Stoller, V.E. Valencia, J. Wang, R.C. Wang, and S.R. Cummings

Table 3. Primary and Secondary Study Outcomes According to Study Group.*

Outcome	Point-of-Care Ultrasonography (N=908)	Radiology Ultrasonography (N=893)	Computed Tomography (N=958)	P Value
Primary Outcomes				
High-risk diagnosis with complication — no. of patients (%)	6 (0.7)	3 (0.3)	2 (0.2)	0.30
Radiation exposure — mSv	10.1±14.1	9.3±13.4	17.2±13.4	<0.001
During emergency department enrollment visit	6.5±9.4	4.7±8.4	14.1±9.6	<0.001
From enrollment to 30 days	1.2±4.4	1.8±5.4	1.0±3.9	0.19
30–180 days	1.5±5.5	2.1±6.8	1.2±4.8	0.08
Accuracy for diagnosis of nephrolithiasis‖				
Sensitivity — % (95% CI)	85 (80–89)	84 (79– 89)	86 (82–90)	0.74
Specificity — % (95% CI)	50 (45–54)	53 (49–57)	53 (49–58)	0.38

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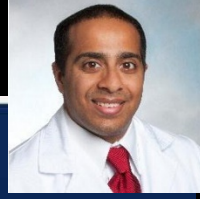
Ten Things Physicians and Patients Should Question

10 **Avoid ordering CT of the abdomen and pelvis in young otherwise healthy emergency department (ED) patients (age <50) with known histories of kidney stones, or ureterolithiasis, presenting with symptoms consistent with uncomplicated renal colic.**

Kidney stones can cause severe pain (called renal colic) and nausea, which can usually be relieved with medication. Most stones pass spontaneously in the urine in a few days, though kidney stones often do recur. CT scans may be needed to diagnose kidney stones, and rule out other problems that may mimic the pain of kidney stones. Many patients in the ED who are less than 50 years old and who have symptoms of recurrent kidney stones do not need a CT scan unless these symptoms persist or worsen, or if there is a fever or a history of severe obstruction with previous stones. CT scans of patients in the ED with symptoms of recurrent kidney stones usually do not change treatment decisions, and the cost and radiation exposure can often be avoided in these cases. Close follow-up by a primary care physician or specialist is necessary.



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2017 E-QUAL Learning Collaboratives are closed. If you are interested in signing up your ED site into the E-QUAL Network for 2018 please fill out the **interest survey.**

For more information on how to join the ACEP Emergency Quality Network please email **equal@acep.org**

E-QUAL Initiatives Portal

What is the Transforming Clinical Practice Initiative?

The Transforming Clinical Practice Initiative (TCPi) is designed to help clinicians achieve large-scale health transformation. The initiative is designed to support more than 140,000 clinician practices over the next four years in sharing, adapting and further developing their comprehensive quality improvement strategies. The initiative is one part of a strategy advanced by the Affordable Care Act to strengthen the quality of patient care and spend health care dollars more wisely.

About the Emergency Quality Network:

- ACEP Emergency Quality Network (E
- E-QUAL: What your Hospital C-Suite
- ACEP E-QUAL Network Frequently A

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CEDR - Clinical Emergency Data Registry

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QI Measures Supported

QI #	Description	Domain	Type
ACEP #QI01	Sepsis Management: Septic Shock: Blood Cultures Ordered	Effective Clinical Care	Process
ACEP #QI02	Emergency Medicine: Appropriate Use of Imaging for Recurrent Renal Colic	Efficiency: Overuse	Process

**QI measures are not included for 2017 QCDR Reporting*

To view the detailed measure specification for CEDR QI Measures, download this PDF →

EDICINE

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Date of origin: 1995
Last review date: 2015

American College of Radiology
ACR Appropriateness Criteria®

Clinical Condition: **Acute Onset Flank Pain—Suspicion of Stone Disease (Urolithiasis)**

Variant 1: **Suspicion of stone disease.**

Radiologic Procedure	Rating	Comments	RRL*
CT abdomen and pelvis without IV contrast	8	Reduced-dose techniques are preferred.	☢☢☢☢
CT abdomen and pelvis without and with IV contrast	6	This procedure is indicated if CT without contrast does not explain pain or reveals an abnormality that should be further assessed with contrast (eg, stone versus phleboliths).	☢☢☢☢
US color Doppler kidneys and bladder retroperitoneal	6		O

Variant 2: **Recurrent symptoms of stone disease.**

Radiologic Procedure	Rating	Comments	RRL*
CT abdomen and pelvis without IV contrast	7	Reduced-dose techniques are preferred.	☢☢☢☢
US color Doppler kidneys and bladder retroperitoneal	7	This procedure is indicated in an emergent setting for acute management to evaluate for hydronephrosis. For planning and intervention, US is generally not adequate and CT is complementary as CT more accurately characterizes stone size and location.	O

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ACEP/AUA/ACR Best Practice WIP

- E-QUAL/CEDR goal of reducing avoidable imaging in low risk patients
  - ACEP Choosing Wisely recommendation for ultrasound in patients <50yo w recurrent colic
- Imaging decisions involve both front-line (ED) physicians as well as imaging (radiology) and downstream (urology) MDs
- →Developing collaborative evidence- and consensus-based best practice document
  - Future cross-cutting quality measures?

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Evolving Regulation/Reimbursement

- 2014 Protecting Access to Medicare Act
  - Consultation of appropriate-use criteria
  - DICOM-compliant structured dose reporting
  - Dose check features, automatic exposure control
    - ACR XR29 FAQs; resources
  - Referencing Adult/Pediatric protocols
- NQF Measures
  - CT Radiation Dose Patient Safety Measure
  - Voluntary submission of dose /benchmarking
  - DOSE group developing new effectiveness measure

TNTC opportunities for urologists

- AUA: disseminating MUSIC model via AQUA
  - Opportunities to enhance value of care
- DOSE/RadIQ: disseminating best practices to achieve implementation of low-dose CT
- ACR resources
  - Appropriateness criteria, RSCAN, Dose Index Registry, PIRADS—potential accreditation
- ACEP activities: disseminating ultrasound; opportunities to enhance collaboration
- MIPS/ACGME QI requirements
  - AUA QI program

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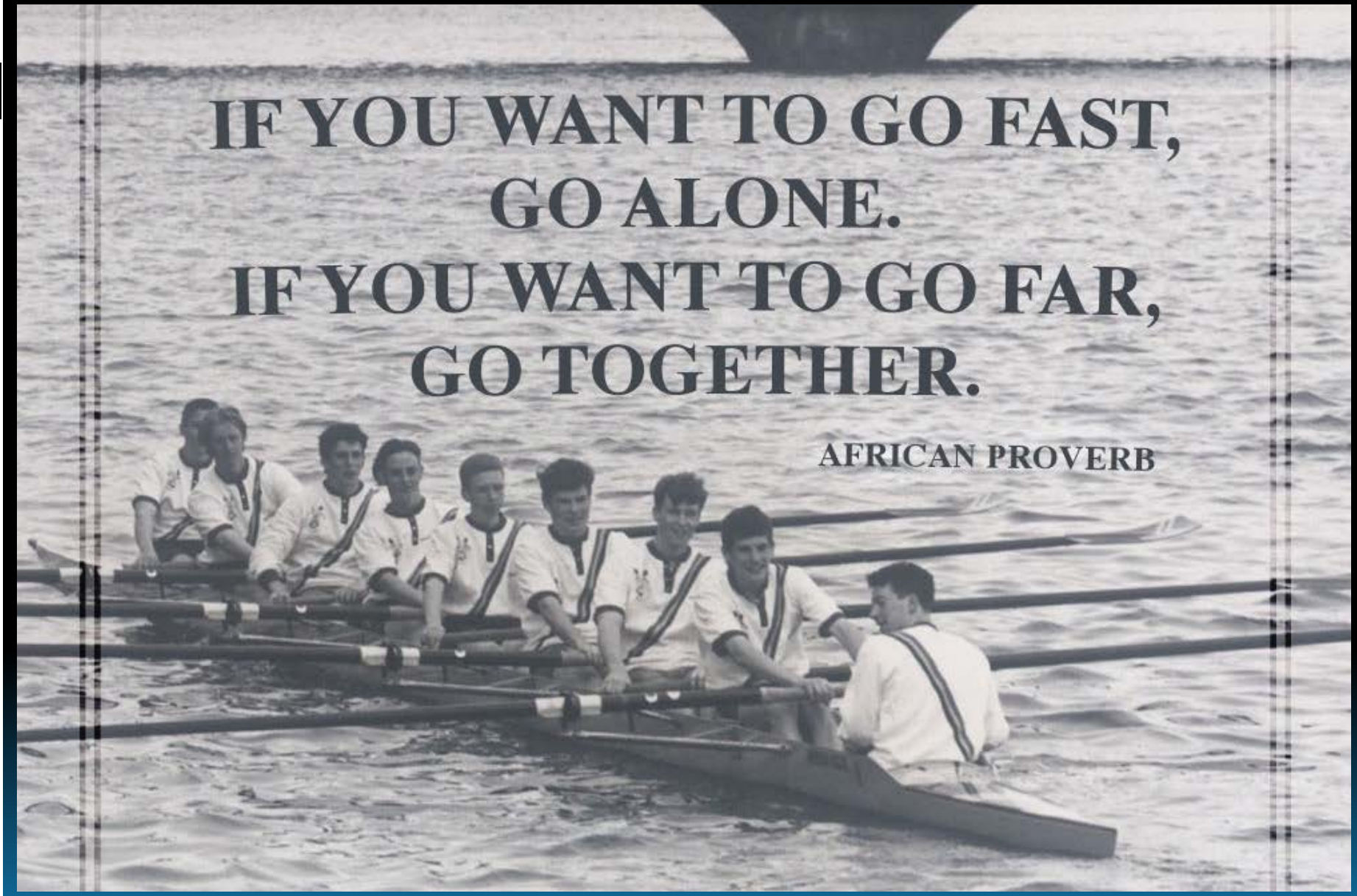

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2017 AUA Quality Improvement Summit

Challenges and Opportunities for Stewardship of Urological Imaging

- **Thank you for joining us!**

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Thank You

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: @m_e_nielsen

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