

Translating Evidence into Best Practices

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Learning Objective

- Describe current healthcare context of outcomes based practice improvement
 - Discuss approaches to apply evidence and improve current clinical practice
-

Current healthcare context

- Increasingly patient-centered and evidence-based
 - Shifting from volume-based care to value-based care
 - Reimbursement being linked to performance and outcomes
-

Questions to discuss

- How am I doing?
- How can I do what I do better?
- How can I and my practice do what we do better?

Defining Value in Health Care

Health Outcomes Achieved

Dollars spent

- Increasing value in health care
 - What matters for patients
 - What unites all of us who care for patients
- Value *is*: Good outcomes achieved efficiently
 - Improving outcomes without increasing costs
 - Reducing costs without compromising outcomes

ME Porter NEJM 2009; 361: 109-112

ME Porter NEJM 2010; 363: 2477-2481

TH Lee NEJM 2010; 363: 2481-2483

TH Lee JAMA Int Med 2014; epub 4/28/14

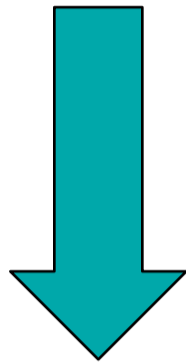
Translating Value Framework into

- Outcomes
 - Condition specific, multidimensional
 - No single outcome captures the results of care
 - Multiple outcomes matter for any patient condition
- Value framework requires teamwork
 - Interdisciplinary teams organized around conditions
 - Changes in how physicians work together and with patients
 - Standardization of best practices

ME Porter NEJM 2009; 361: 109-112

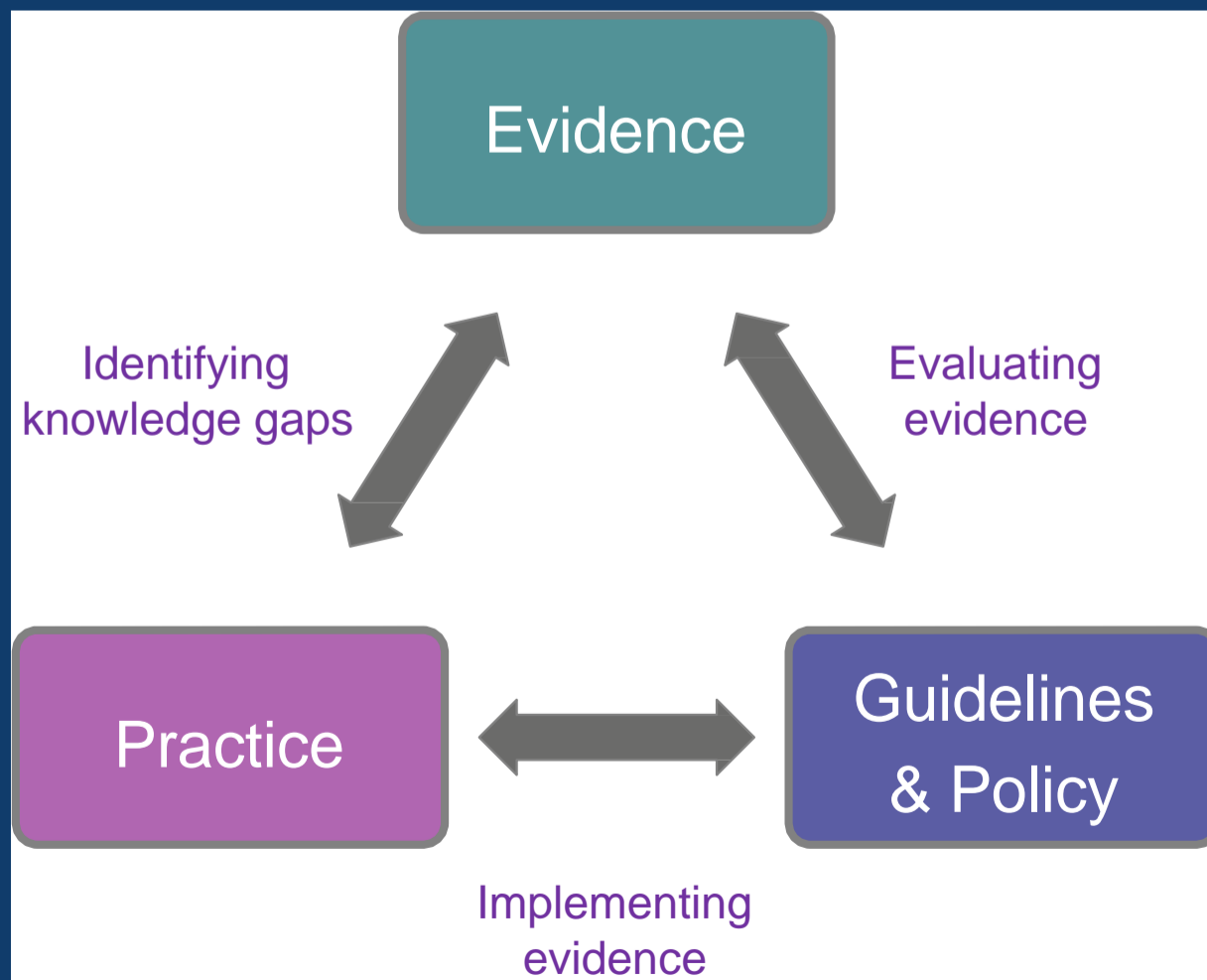
Theoretically...

More Knowledge.



Better Practice.

Value framework in practice



How am I doing?

Performance at the level of the individual

- Important for improving clinical practice
- Required by federal law
 - Mammography Quality Standards Act (MQSA) of 1992
 - Implemented by the Food and Drug Administration
 - “Access to quality mammography for the detection of breast cancer in its earliest, most treatable stages”
 - Requires each facility to establish a medical outcomes audit program
 - Follow up positive results
 - Correlate pathology with interpreting physician’s report
 - At the level of both the individual and facility

How am I doing?

- Critical first step is measurement
- Supported by the American College of Radiology
 - Developed the ACR Breast Imaging Data and Reporting System (BI-RADS)
 - Provides guidance for conducting a medical outcomes audit that meets and exceeds that required by the FDA
 - Most recent 5th edition extends auditing from mammography to multimodality breast imaging (US and MRI)



Performance measures

- For breast imaging interpretation
 - Cancer detection rate per 1,000 examinations
 - Abnormal interpretation (recall) rate for screening
 - Positive predictive values
 - Sensitivity and specificity (if measurable)
 - Characteristics of breast cancers
 - Median size of invasive cancers
 - Percentage minimal cancer (DCIS or invasive cancer <1 cm)
 - Percentage stage 0 or I
 - Percentage node-negative invasive cancers
 - Definitions provided to enable consistent calculation
 - More complete audit guidance also available



How can I do what I do better?

- Auditing of performance is more clinically useful when compared with accepted benchmarks
- Suggested by ACR in BI-RADS manual
 - Those reported by the Breast Cancer Surveillance Consortium (BCSC) derived from very large numbers of examinations likely to be representative of practice in the United States
 - Recommendations from expert breast imaging radiologists, based on critical analysis of scientific data
 - Outcomes reported from the ACR National Mammography Database

Breast Cancer Surveillance Consortium



- Largest longitudinal collection of breast imaging data in US
- Funded by the National Cancer Institute since 1994
- 6 active, 2 historical registries, linked to cancer registries
- 2.9 million women, 12.6 million breast imaging exams

Mammography Benchmarks

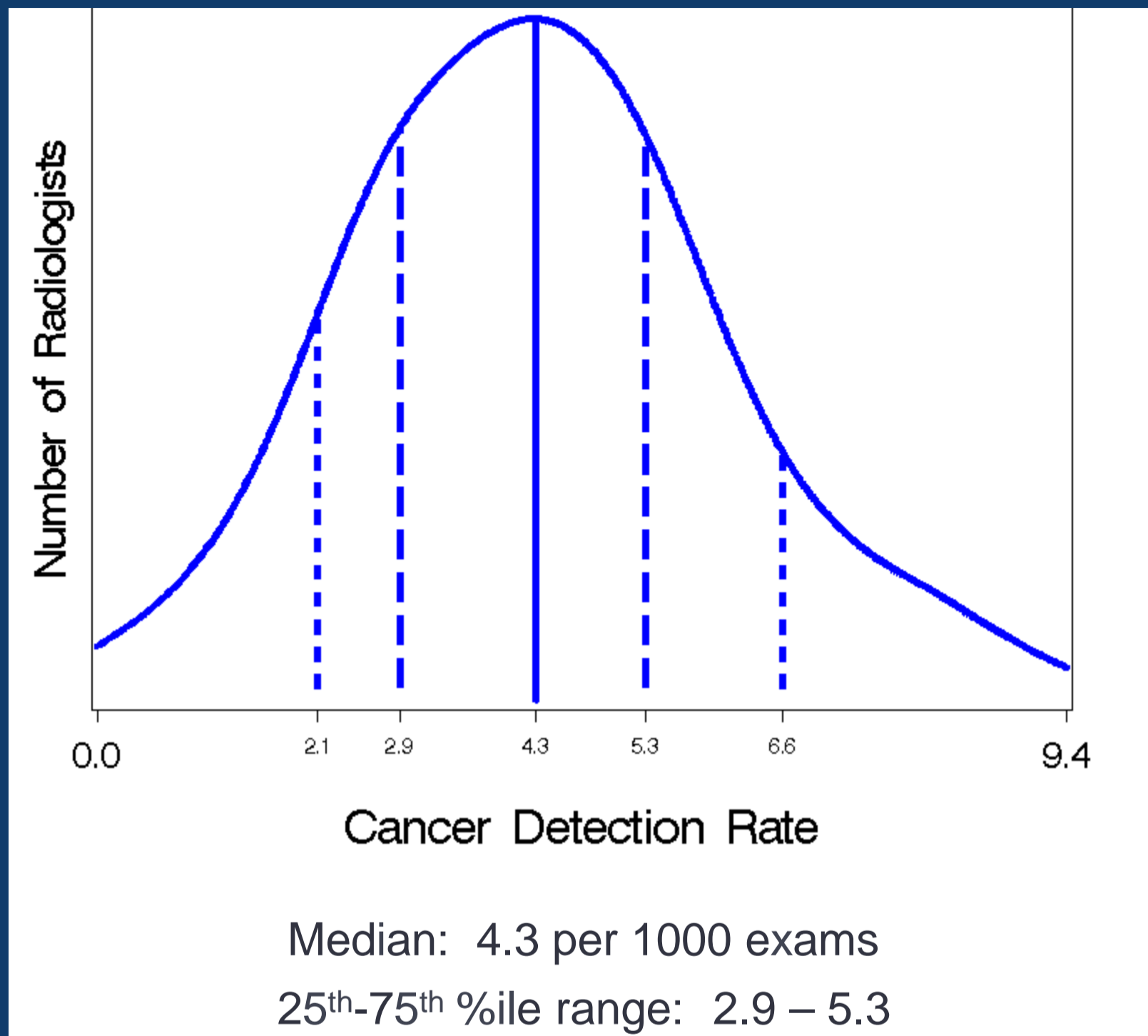


Table 3. Analysis of Medical Audit Data: BCSC Mammography Screening Benchmarks^a

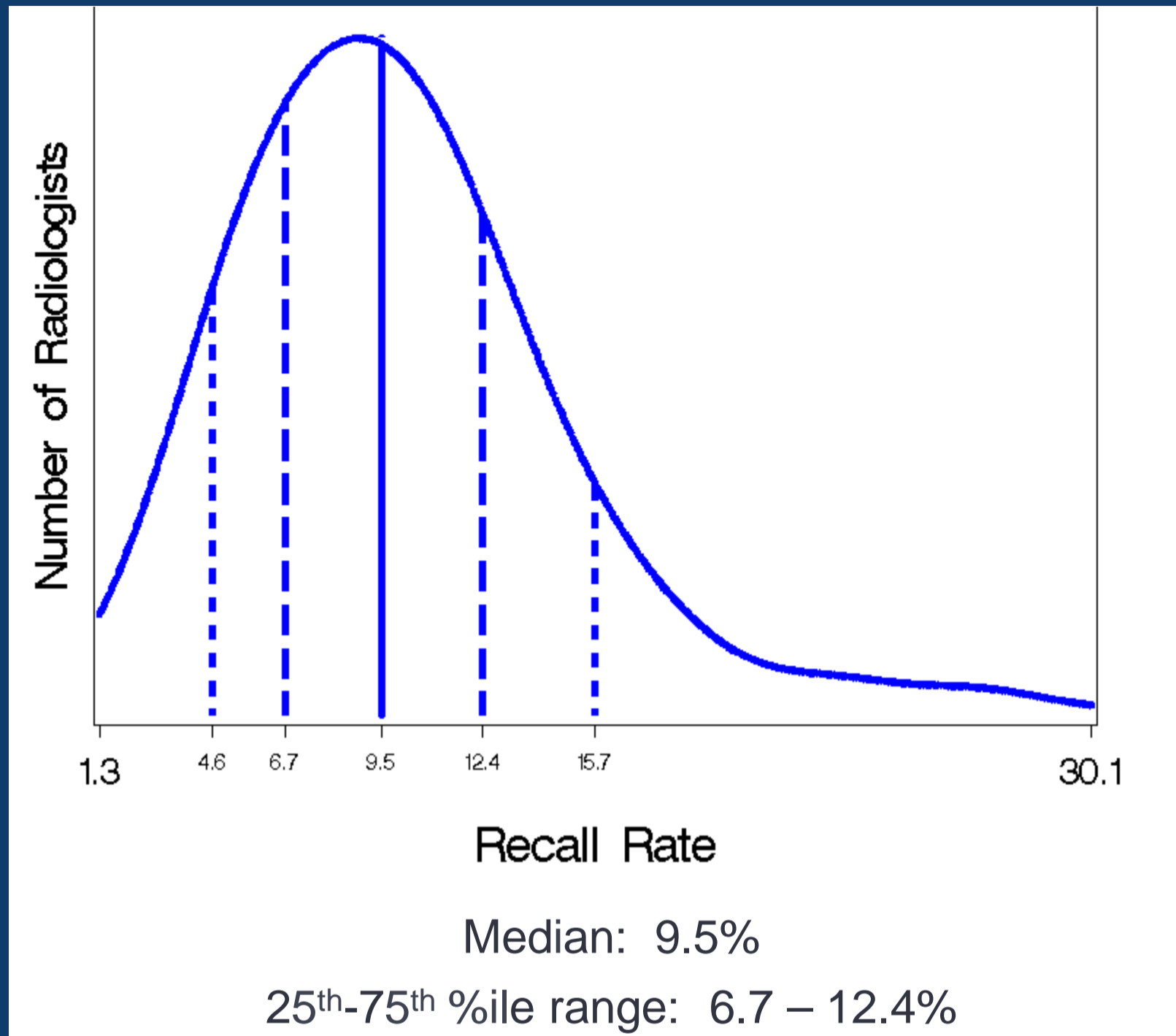
Cancer detection rate (per 1,000 examinations)	4.7
Median size of invasive cancers (in mm)	14.0
Percentage node-negative of invasive cancers	77.3%
Percentage minimal cancer ^b	52.6%
Percentage stage 0 or 1 cancer	74.8%
Abnormal interpretation (recall) rate	10.6%
PPV ₁ (abnormal interpretation)	4.4%
PPV ₂ (recommendation for tissue diagnosis)	25.4%
PPV ₃ (biopsy performed)	31.0%
Sensitivity (if measurable) ^c	79.0%
Specificity (if measurable) ^c	89.8%

- Screening and diagnostic mammography benchmarks in BI-RADS manual and BCSC website - <http://breastscreening.cancer.gov/statistics/benchmarks/screening/>

Screening benchmark ranges



Screening benchmark ranges



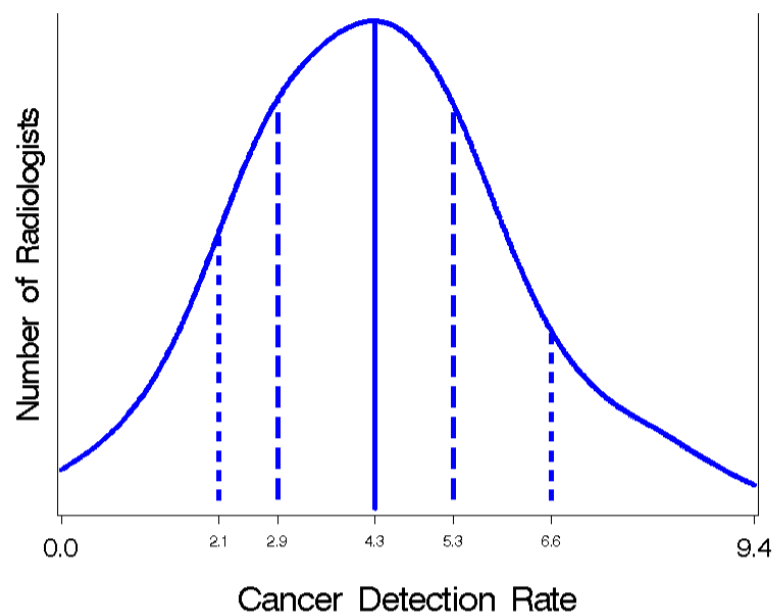
Acceptable ranges of performance

Table 7. Analysis of Medical Audit Data: Acceptable Ranges of Screening Mammography Performance^a

Cancer detection rate (per 1,000 examinations)	≥ 2.5
Abnormal interpretation (recall) rate	5%-12%
PPV ₁ (abnormal interpretation)	3%-8%
PPV ₂ (recommendation for tissue diagnosis)	20%-40%
Sensitivity (if measurable) ^b	≥ 75%
Specificity (if measurable) ^b	88%-95%

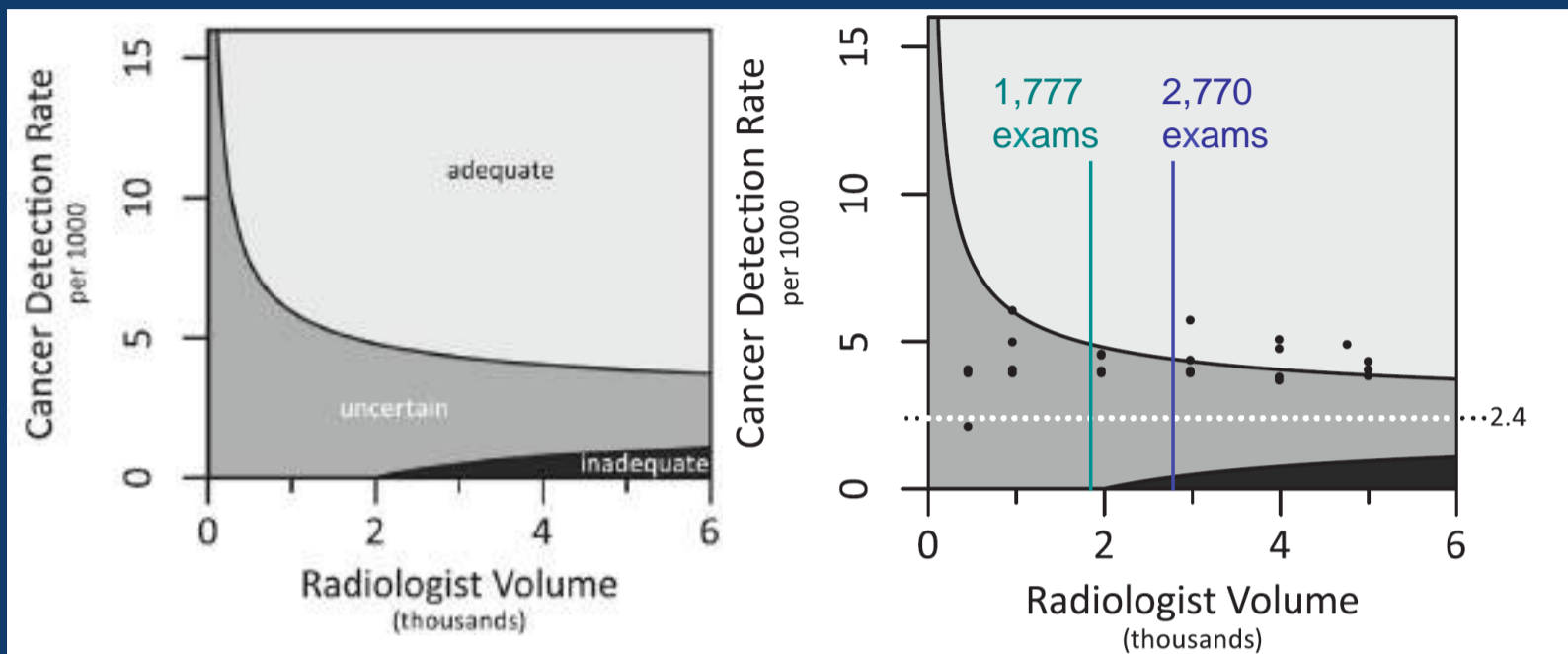
- Based on expert breast imaging panel review and BCSC data
- Performance outside of stated ranges may prompt additional review, with consideration given to recommendation for additional training
- Acceptable ranges available for screening and diagnostic mammography

In or out of range?



- Example case
- CDR benchmark: 4.3 per 1000 screens
- Average US annual volume: 1777 exams
 - CDR target = 7.5 or 8 cancers
- What if?
 - 5 cancers are detected?
 - CDR = 2.8 per 1000 (5/1777)
 - Performance in lowest quartile?

Defining adequate performance based on volume



Auditing over two years may provide a more accurate assessment of performance

Burnside, et al. PLOS one 2014 9: e89418

Acceptable ranges of performance

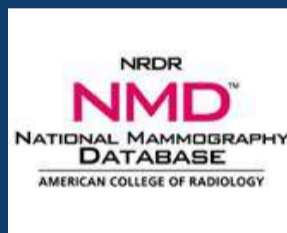
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- Performance outside of stated ranges may prompt additional review, “in the context of outcomes for all other metrics, and the specific practice setting”
- with consideration given to recommendation for additional training
- Acceptable ranges available for screening and diagnostic mammography

National Mammography Database

- Part of the ACR's National Radiology Data Registry
- Provides feedback reports on performance measures and comparison with other facilities in the NMD and also with BCSC benchmark data
- Participation is free for facilities with Breast Imaging Center of Excellence (BICOE) designation
- Discussed further by Dr. Robert Rosenberg



How can I and my practice do what we do better?

- Stay abreast of current guidelines
- Stay current with Maintenance of Certification
- Scan the horizon

Current guidelines

- ACR Appropriateness guidelines
 - Evidence-based guidelines for specific clinical conditions
 - Reviewed by a multidisciplinary expert panel every two years
 - Example

JACR 2013; 10: 742-749

ACR Appropriateness Criteria Palpable Breast Masses

Jennifer A. Harvey, MD^a, Mary C. Mahoney, MD^b, Mary S. Newell, MD^c,
Lisa Bailey, MD^{d,e}, Lora D. Barke, DO^f, Carl D'Orsi, MD^c, Mary K. Hayes, MD^g,
Peter M. Jokich, MD^h, Su-Ju Lee, MD^b, Constance D. Lehman, MD, PhDⁱ,
Martha B. Mainiero, MD^j, David A. Mankoff, MD, PhD^{k,l}, Samir B. Patel, MD^m,
Handel E. Reynolds, MDⁿ, M. Linda Sutherland, MD^o, Bruce G. Haffty, MD^p

Palpable breast lump, age>40 yrs

Variant 1. Woman aged ≥ 40 years, initial evaluation (see Appendices 1A and 1B, available online at <http://dx.doi.org/10.1016/j.jacr.2013.06.013> for additional steps in the workup of these patients)

Radiologic Procedure	Rating	Comments	Relative Radiation Level
Mammography diagnostic	9		☼☼
Ultrasound breast	4	If patient had recent mammography (ie, past 6 mo), ultrasound may be appropriate.	○
MRI breast without and with contrast	2		○
MRI breast without contrast	1		○
FDG-PEM	1		☼☼☼☼
^{99m}Tc sestamibi BSGI	1		☼☼☼☼
Image-guided fine-needle aspiration breast	1		Varies
Image-guided core biopsy breast	1		Varies

Note: Rating scale: 1, 2, and 3 = usually not appropriate; 4, 5, and 6 = may be appropriate; 7, 8, and 9 = usually appropriate. BSGI = breast specific gamma imaging; FDG = ^{18}F fluorodeoxyglucose; PEM = positron emission mammography.

Initial evaluation starts with mammography
Highest rating for appropriateness (9)

Palpable breast lump, ages 30-39 yrs

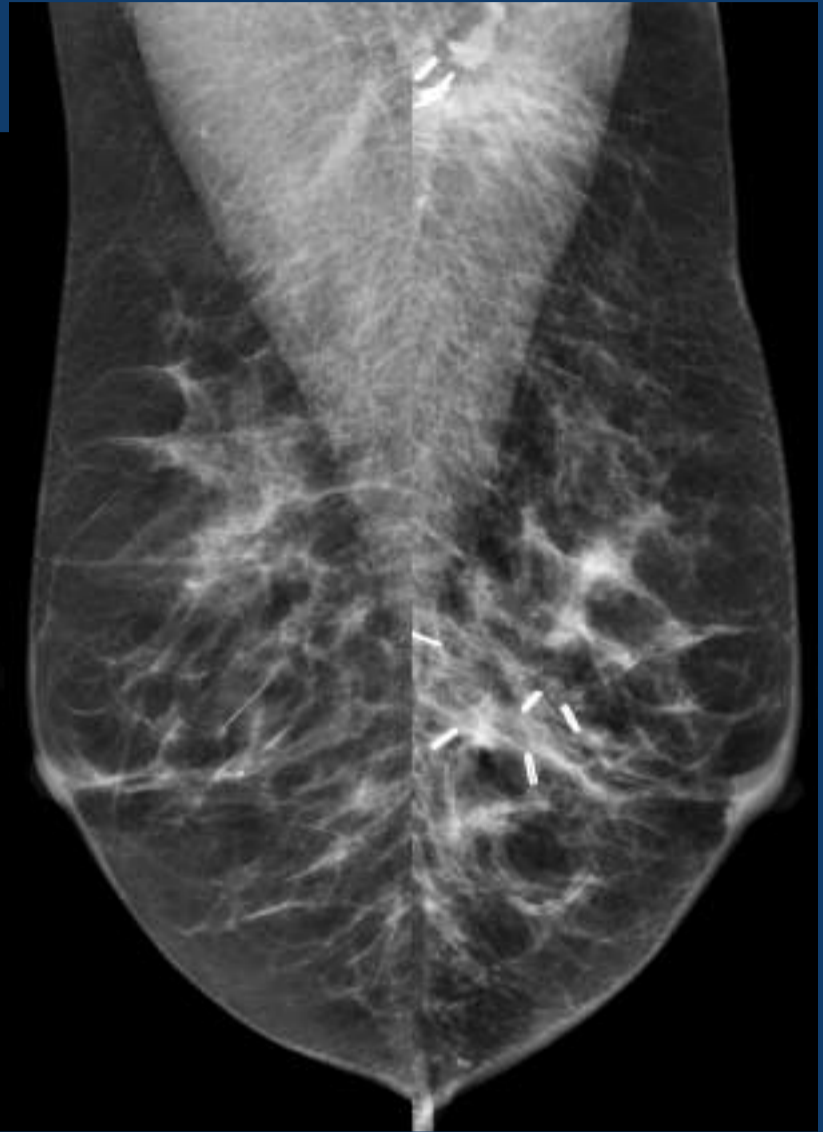
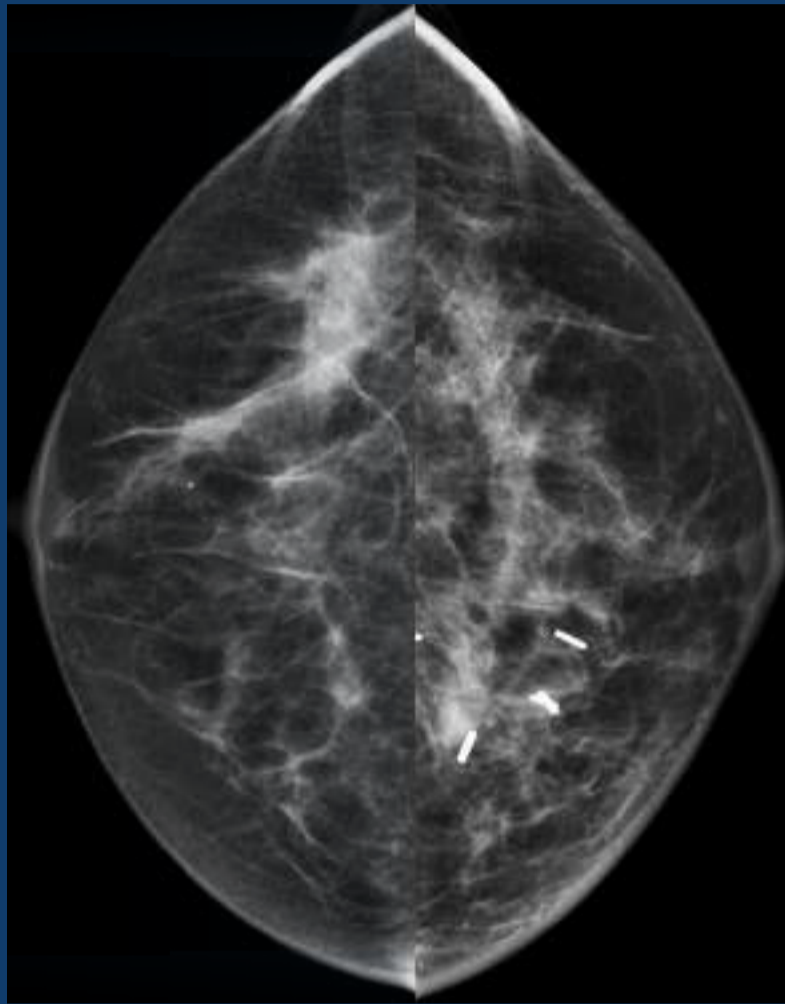
Variant 11. Woman aged 30 to 39 years, initial evaluation (see Appendix 3 available online at <http://dx.doi.org/10.1016/j.jacr.2013.06.013> for additional steps in the workup of these patients)

Radiologic Procedure	Rating	Comments	Relative Radiation Level
Ultrasound breast	8	If imaged initially with ultrasound, see Variants 7-10 for additional imaging.	○
Mammography diagnostic	8	If imaged initially with mammography, see Variants 2-5.	☼☼
MRI breast without and with contrast	2		○
MRI breast without contrast	1		○
FDG-PEM	1		☼☼☼☼
^{99m}Tc sestamibi BSGI	1		☼☼☼☼
Image-guided fine-needle aspiration breast	1		Varies
Image-guided core biopsy breast	1		Varies

Note: Rating scale: 1, 2, and 3 = usually not appropriate; 4, 5, and 6 = may be appropriate; 7, 8, and 9 = usually appropriate.

Initial evaluation can start with either mammography or US
Both given high appropriateness ratings (8)

Post-treatment imaging surveillance



Post-treatment imaging surveillance

- Goal
 - Earlier detection of second breast cancers
 - Permit interventions to improve survival and maintain quality of life

Breast cancer survivors

- Current clinical context
 - 2.6 million breast cancer survivors
 - Increases projected through 2020
- Women at risk for 2nd breast cancers
 - In-breast recurrences
 - Contralateral breast cancers

American Cancer Society Facts & Figures 2013-14 Parry C, et al. CEBP 2011: 20: 1996-2005

Mammographic surveillance

- Evidence summary
 - Regular mammographic surveillance is associated with improved outcomes
 - Best estimate: 17-28% absolute mortality reduction
 - Stage I or II BC, Adjusted OR=0.66 (95%CI: 0.51-0.86)
 - Adherence to mammographic surveillance declines with time
 - Especially women age <40 years
 - Suggests some underuse of appropriate imaging

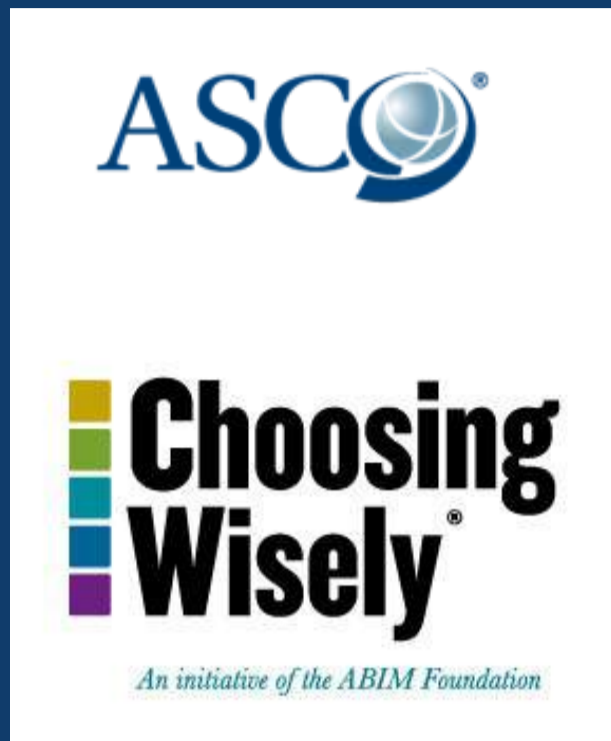
Lu WL et al. Br Ca Res Treat 2009; 114: 403-412, Houssami N, et al. The Breast 2010; 19: 439-445 Lash TL, et al. Br Ca Res Treat 2005; 89: 61-67, Lash TL, et al. The Breast J 2006; 12: 2-6 Doubeni CA et al. Cancer 2006; 106: 2482-2488, Field TS, et al JGIM 2008; 23: 158-163

Post-treatment imaging surveillance



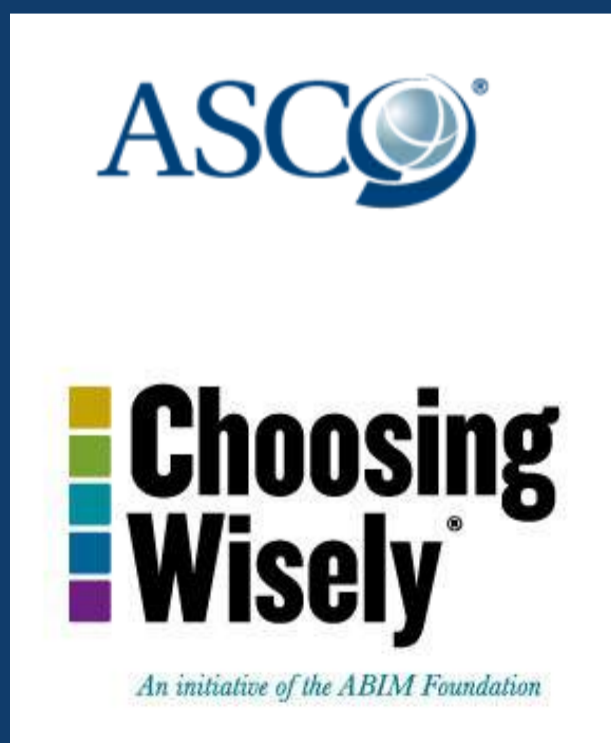
- What is recommended
 - Physical Examination
 - Annual Mammography

Post-treatment imaging surveillance



- What is recommended
 - Physical Examination
 - Annual Mammography
- **What is not recommended**
 - PET and PET-CT for routine surveillance
 - Local/Regional or Distant relapse

Current Top 5 List



When to say “Whoa!” to doctors

1. Match anti-emetic drugs to regimen- based risk
2. Single-drug chemotherapy for metastatic breast cancer
3. **Avoid PET or PET-CT in routine follow-up care**
4. No PSA in asymptomatic pts when life expectancy is <10 years
5. Biomarker confirmation before targeted therapy use

Post-treatment imaging surveillance



- What is recommended
 - Physical Examination
 - Annual Mammography
- **What is not recommended**
 - PET and PET-CT for routine surveillance
- What about breast MRI?
 - ASCO: Recommends against
 - NCCN: Utility undefined
 - ACS: Insufficient evidence
 - ACR/SBI: In selected patients, based on risk

Breast cancer survivors

- Evidence summary
 - Similar accuracy as screening MRI
 - Limited data from high-risk screening MRI studies
 - Emerging reports from single institution studies
 - Mortality reduction yet to be established
- When evidence is sparse
 - Pro-intervention, pro-technology bias

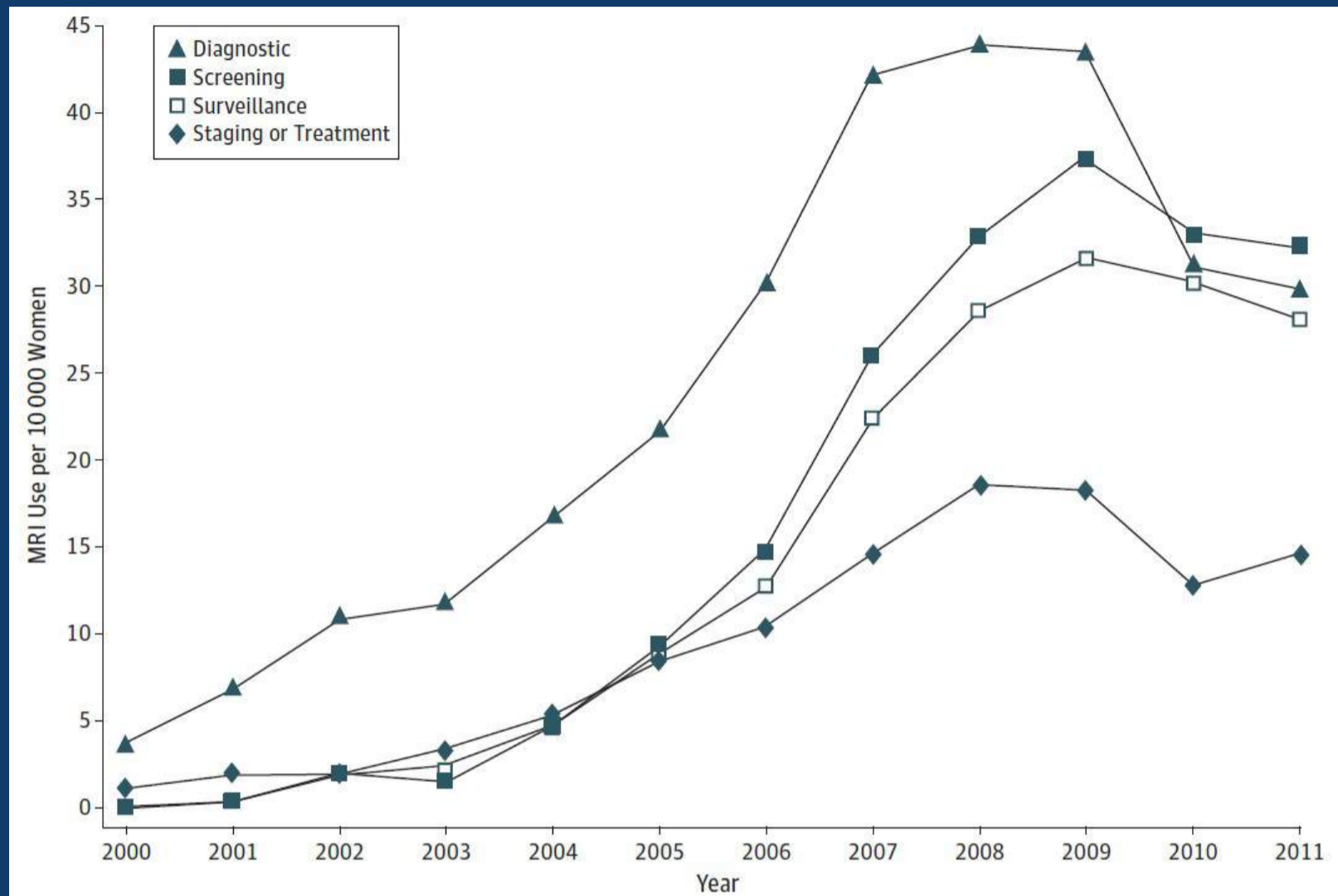
Brennan S, et al. AJR 2010; 195: 510-516

Abramovici G, et al. Radiology 2011; 259: 85-91

Schact DV, et al. AJR 2014; 202: 289-292

Timble JW, et al. Health Aff 2012; 31: 2168-2175

Breast MRI for surveillance

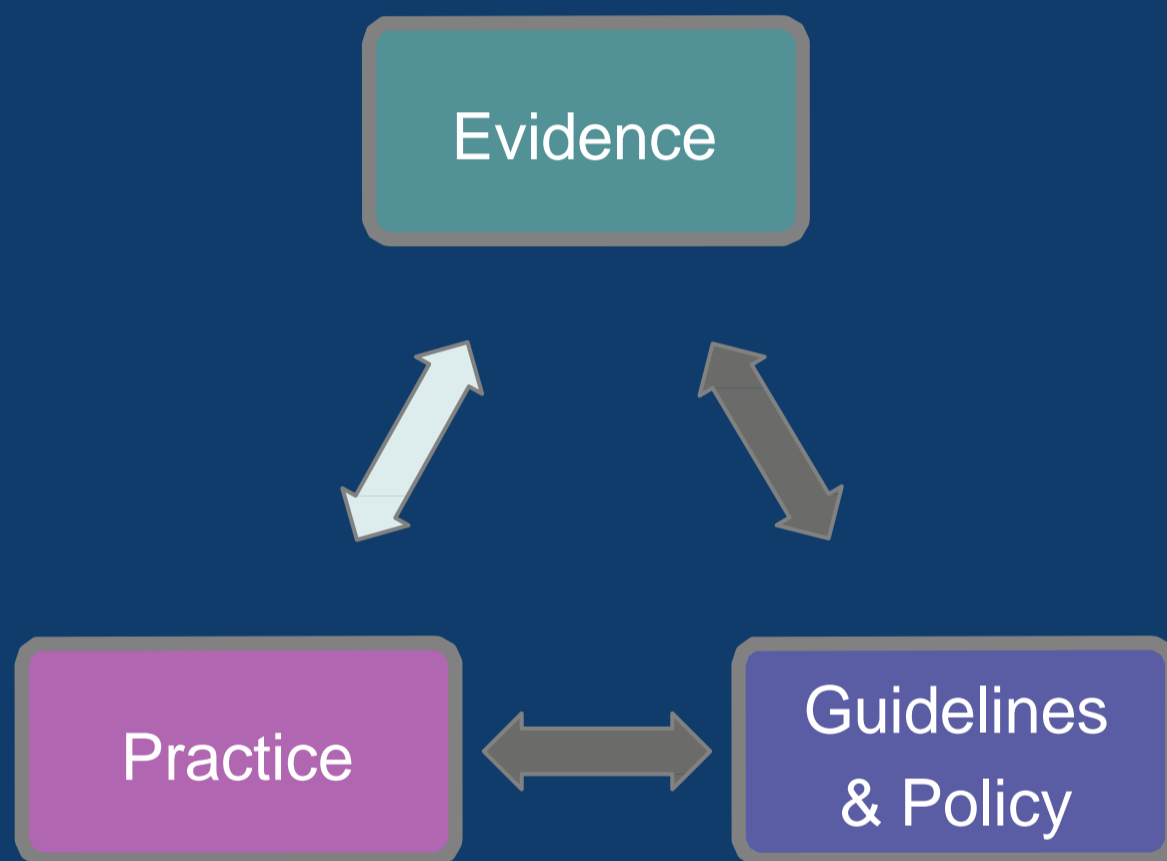


Stout NK, et al. JAMA Int Med 2014; 174:114-121

Wernli K, et al. JAMA Int Med 2014; 174:125-32

Post-treatment imaging surveillance

- Information to improve risk stratification
 - Based on factors known at the time of primary treatment
 - Age, Tumor, Imaging, Treatment
- Who will do well with mammographic surveillance alone?
- Who will benefit from supplemental surveillance?



How can I and my practice do what we do better?

- Stay abreast of current guidelines
 - Stay current with Maintenance of Certification
 - Scan the horizon
-

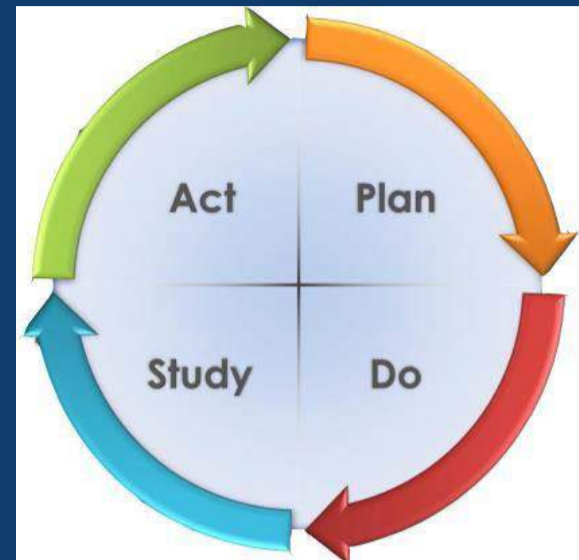
Maintenance of Certification

- Integral part of the quality movement in healthcare
- All new diplomates are currently enrolled
- Four components
 - Professional standing
 - Lifelong Learning and Self-Assessment
 - Cognitive Expertise
 - Practice Quality Improvement (PQI)



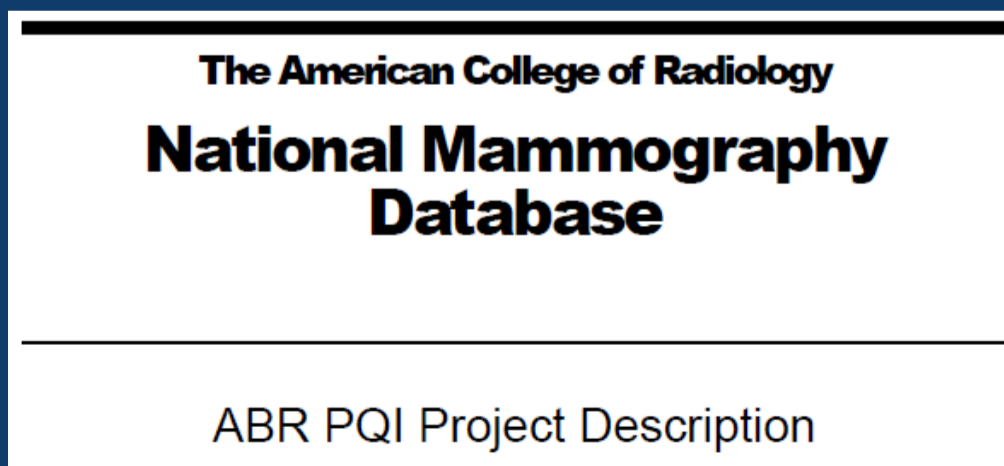
Practice Quality Improvement (PQI)

- Aims to facilitate improvement in medical care
- Both important and required
- Complete at least one PQI project in the previous 3 years
 - Projects require
 - Measurements
 - Data analysis and interpretation
 - Action plans for improvement
 - Self-reflection after completion



PQI projects

- Can be performed as individual, group, or institutional projects
- ABR has partnered with radiology societies to support PQI efforts – SBI and NMD
- <http://www.theabr.org/moc-dr-pqi-projects>

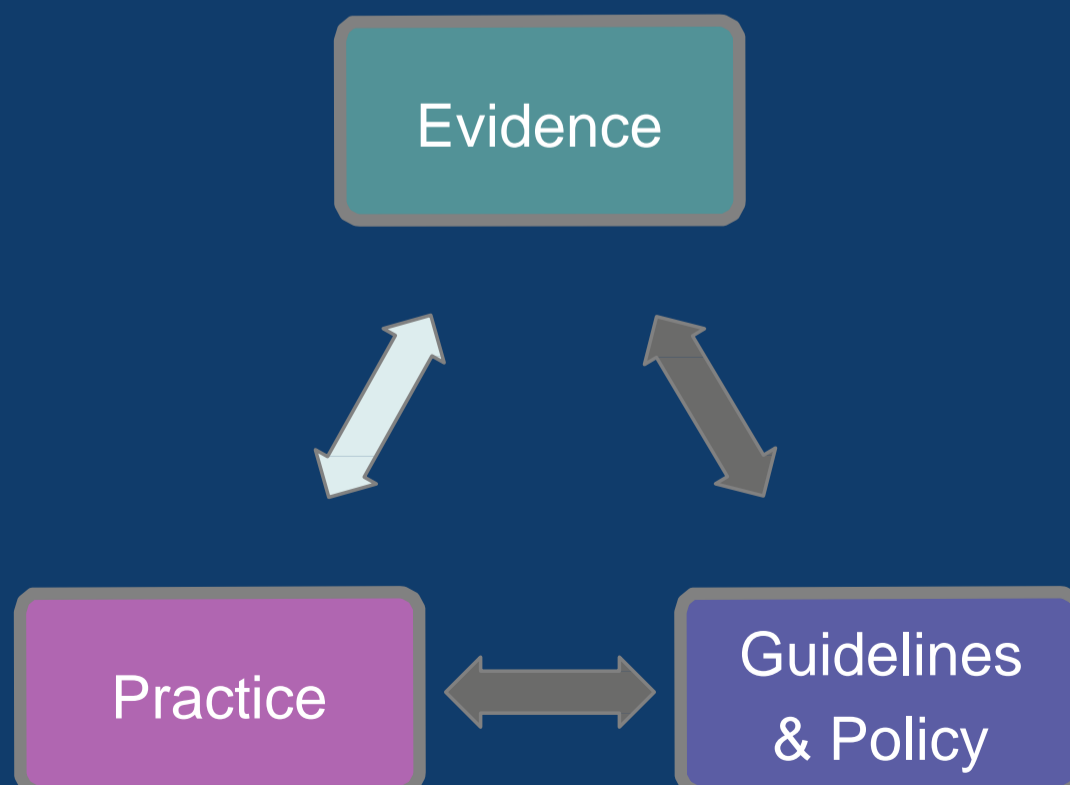


How can I and my practice do what we do better?

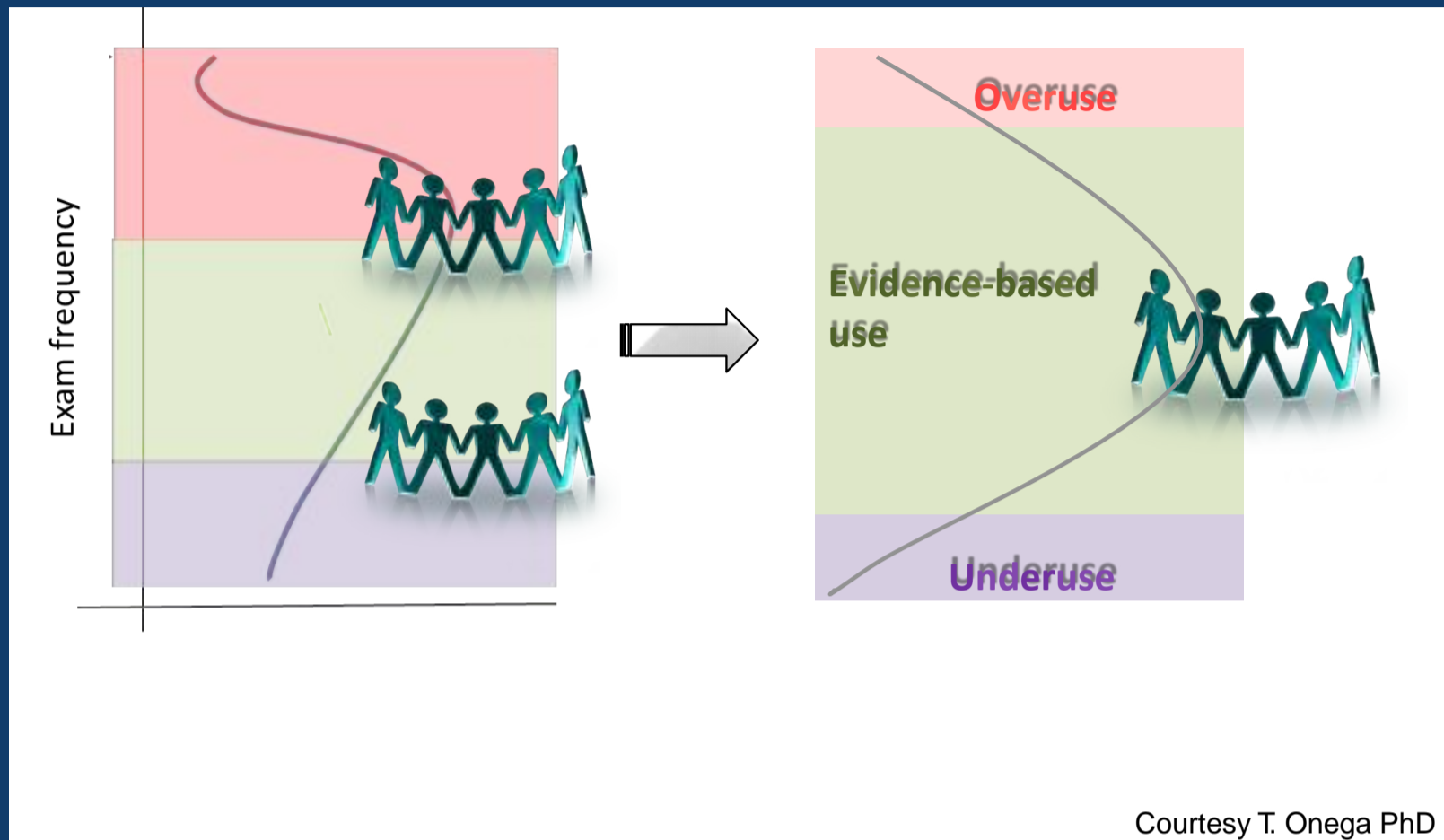
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Scan the horizon

- When to convert from FFDM to DBT?
- Offer supplemental screening with breast ultrasound?
 - With HHUS or ABUS?
- Contrast-enhanced mammography?
- Molecular breast imaging?



Toward optimal use of breast imaging



Defining Value in Health Care

Health Outcomes Achieved

Dollars spent

- Achieving and maintaining good health is less costly than dealing with poor health
- Filling evidence gaps are critical to guide appropriate use of imaging
- Ultimately improve outcomes and value

ME Porter NEJM 2009; 361: 109-112

ME Porter NEJM 2010; 363: 2477-2481

TH Lee JAMA Int Med 2014; epub 4/28/14