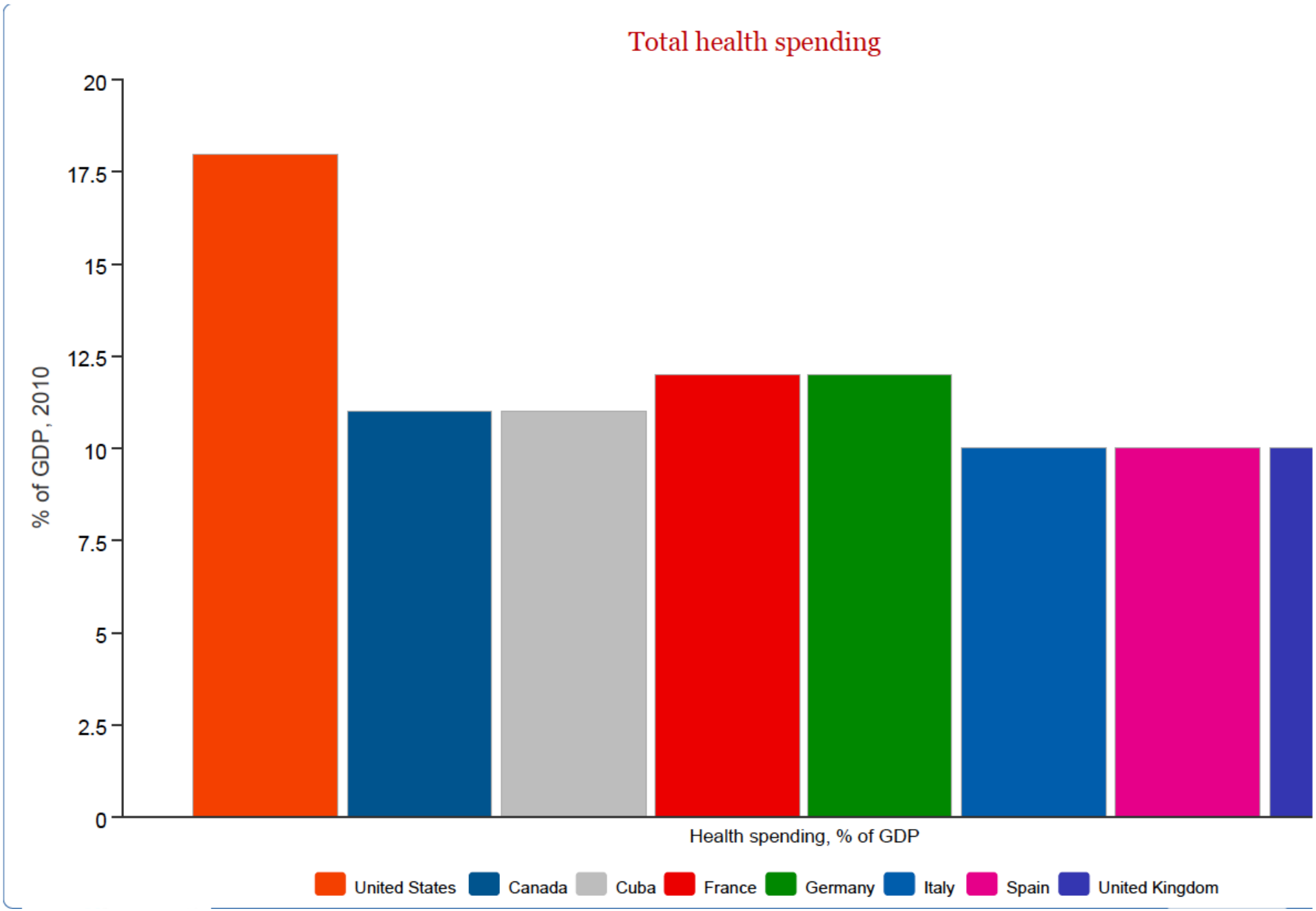
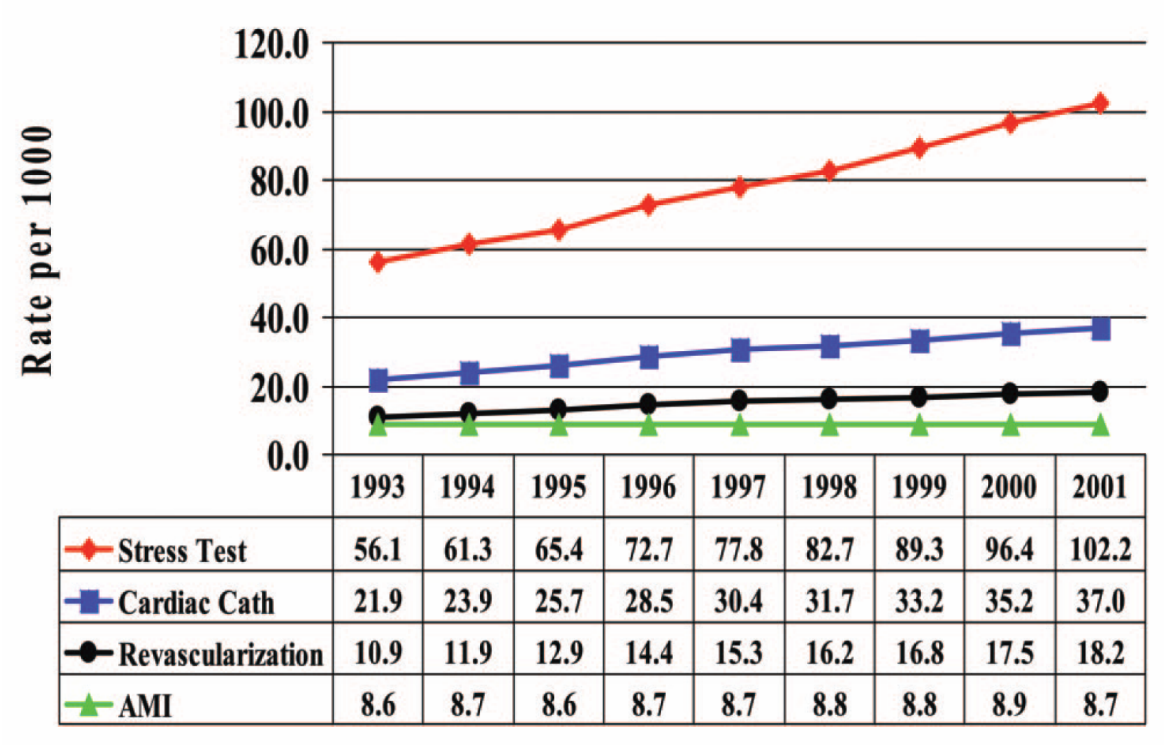
Appropriatezza nella diagnosi di Malattia Coronarica

Rosa Sicari

Istituto di Fisiologia Clinica del CNR, Pisa


Total health spending
20
17.5
15
12.5
10
7.5
5
2.5
0
% of GDP, 2010
Health spending, % of GDP
United States
Canada
Cuba
France
Germany
Italy
Spain
United Kingdom

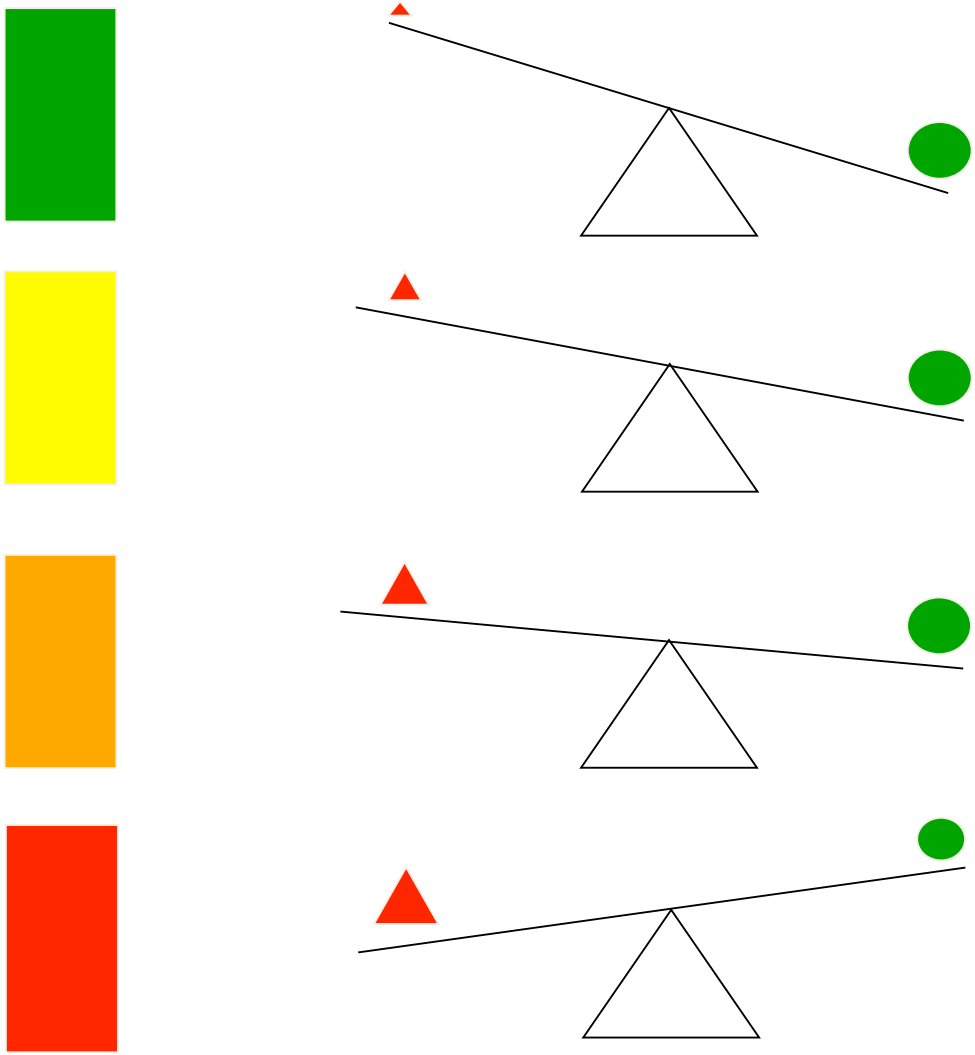
Diagnostic testing, revascularization, and hospitalization for AMI, Medicare, 1993 to 2001



	1993	1994	1995	1996	1997	1998	1999	2000	2001
Stress Test	56.1	61.3	65.4	72.7	77.8	82.7	89.3	96.4	102.2
Cardiac Cath	21.9	23.9	25.7	28.5	30.4	31.7	33.2	35.2	37.0
Revascularization	10.9	11.9	12.9	14.4	15.3	16.2	16.8	17.5	18.2
AMI	8.6	8.7	8.6	8.7	8.7	8.8	8.8	8.9	8.7

Lucas. Circulation 2006;113:374

Risk vs Benefit:
The code of appropriateness



B>>>R

I (appropriate indication)

B>>R

IIa (probably appropriate)

B≥R

IIb (possibly appropriate)

R≥B

III (inappropriate)

AHA-ACC-ESC Guidelines 2007

Why we need appropriateness

To avoid	To obtain
Established practice habits	Awareness of test ordering
Personal opinion	Provide high quality in CV testing
Self-referral	Accessibility but with fiscal responsibility

The appropriateness imperative

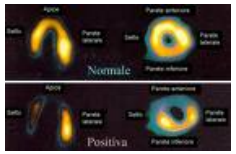
Rita F. Redberg, MD, MSc, FACC, FAHA *San Francisco, CA*

ESC Algorithm in Stable Angina

Clinical evaluation
History and Physical ECG

↓

Assessment of Ischemia
Exercise ECG or
Pharmacological stress imaging or exercise stress imaging

↓

Re-assess likelihood of ischemia as cause of symptoms

↓

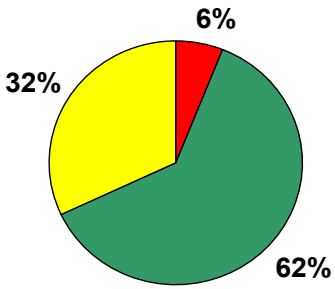
Evaluate prognosis on the basis of clinical evaluation and non-invasive tests

↓

Low Risk Annual CV mortality <1%	Intermediate Risk Annual CV mortality 1-2%	High Risk Annual CV mortality >2%
↓	↓	↓
Medical Therapy	Medical Therapy +/- **Coronary angiography (?)**	Medical Therapy and Coronary angiography

Cardiac imaging: paradox of plenty

Stress echocardiography



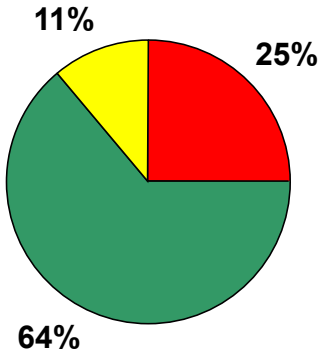
Picano E, Marwick TH. Am Heart J 2007

Inappropriate

Appropriate

Partially inappropriate

Stress Scintigraphy



Gibbons, Pellikka et al. JACC 2008

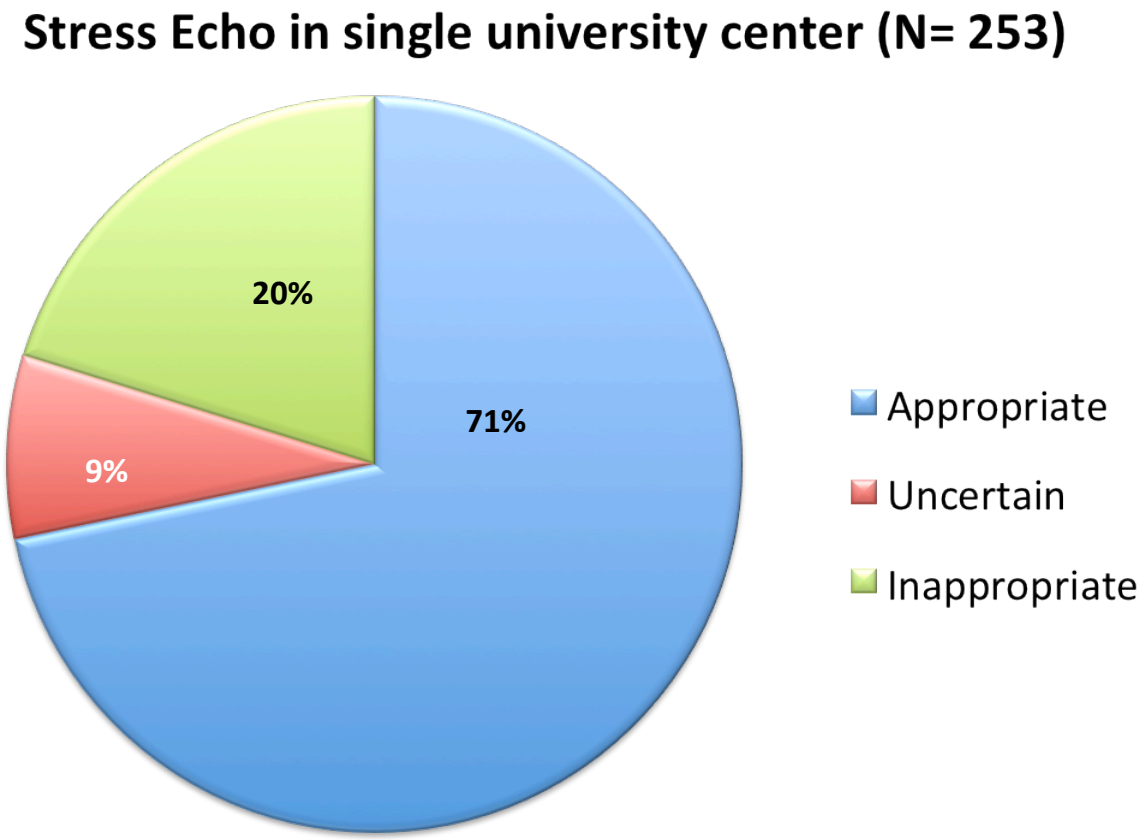
GREEN, non-ionizing

RED, ionizing

R. Redberg. "The imperative of appropriateness". Am Heart J, 2007

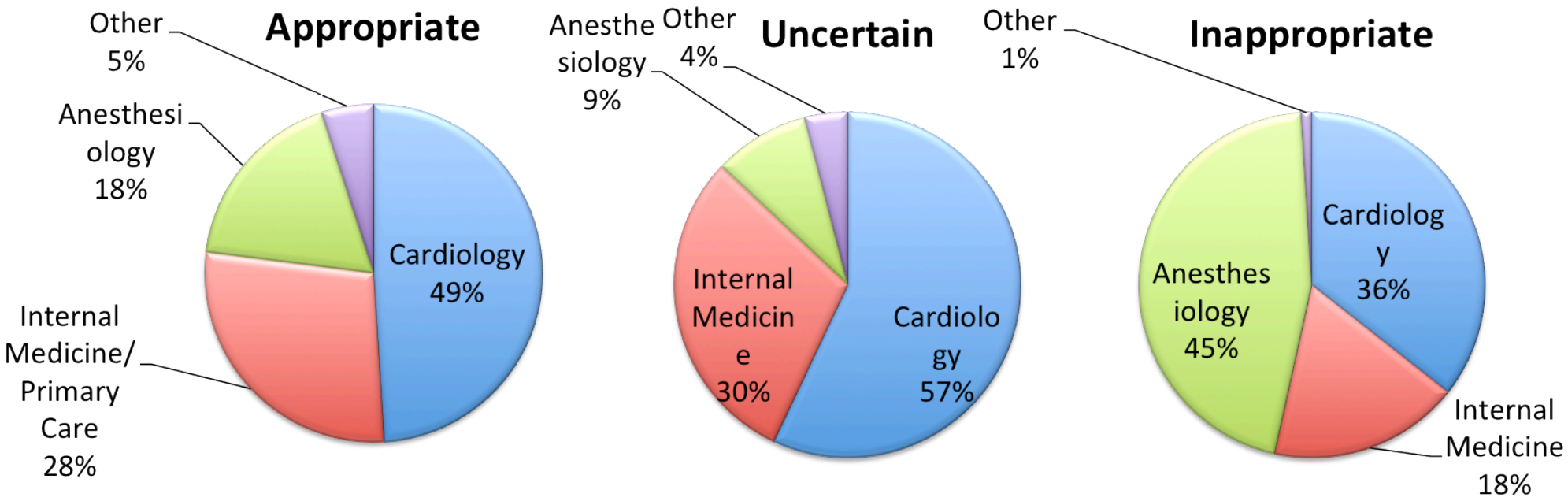
R Bonow "Is Appropriateness appropriate? " JACC 2008

Clinical Application of ACCF/ASE Appropriateness Criteria



Mansour et al. JASE 2010

Clinical Application of ACCF/ASE Appropriateness Criteria Ordering Physicians

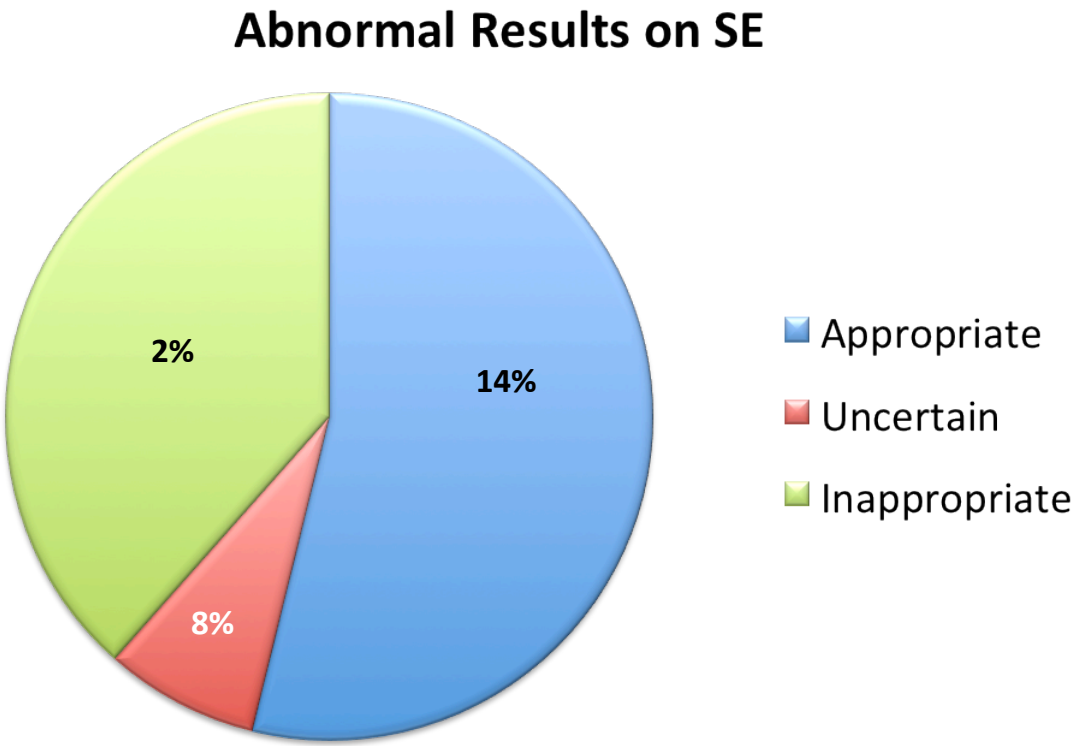


Mansour et al. JASE 2010

Most common inappropriate indications for stress echo

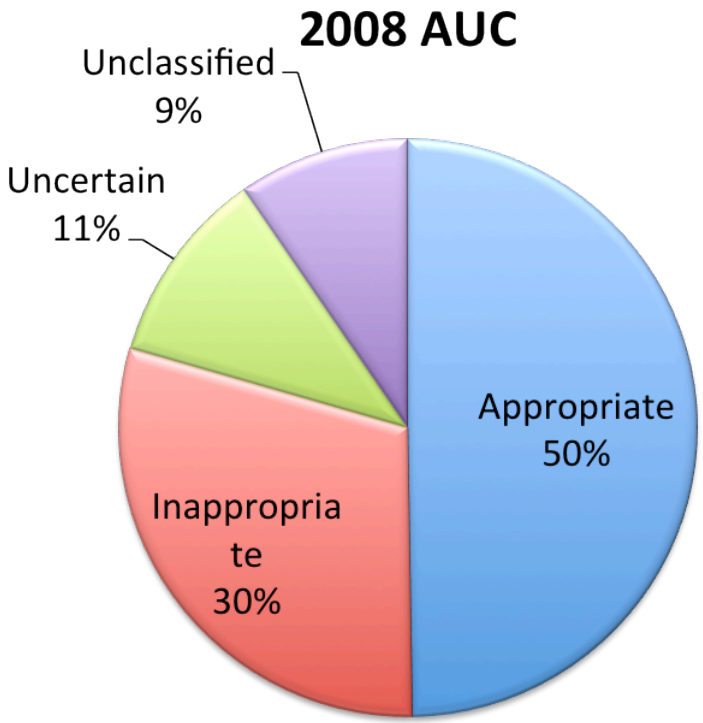
Indication		McCully *Circ Imag 2009*	Mansour *JASE 2010*	Cortigiani *Circ Cardiovasc Img 2011*
114.	• Evaluation of ischemic equivalent (nonacute) in patients with low pre-test probability of CAD who have an interpretable ECG and able to exercise	12%	44%	33%
124.	• Detection of CAD and risk assessment in asymptomatic (without ischemic equivalent) general patient population with low global CAD risk	42%		17%
125.	• Detection of CAD and risk assessment in asymptomatic (without ischemic equivalent) general patient population with intermediate global CAD risk	17%		
154.	• Risk assessment before non cardiac low-risk surgery		14%	
156.	• Risk assessment before non cardiac intermediate-risk surgery in patients with no clinical risk factors		26%	
173.	• Risk assessment in asymptomatic patients <2 years after PCI			28%

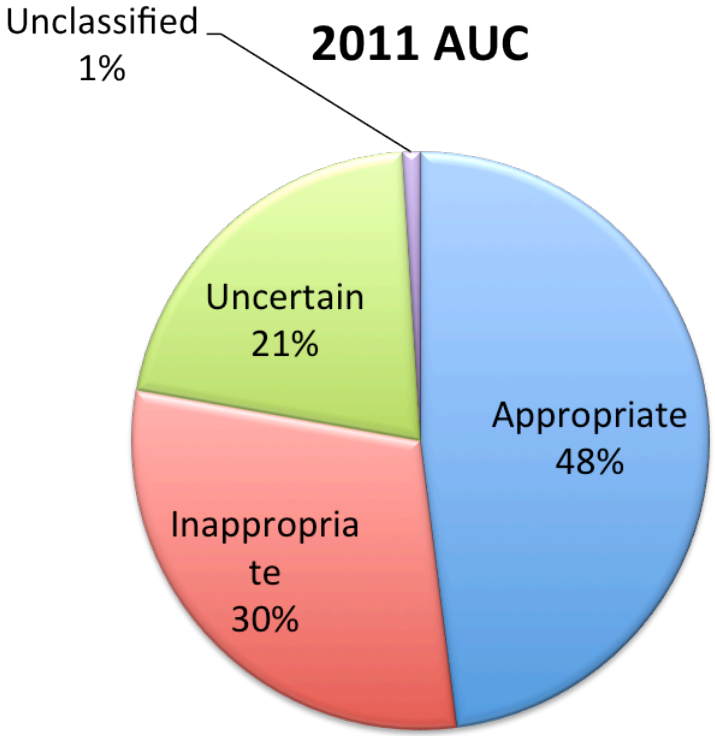
Clinical Application of ACCF/ASE Appropriateness Criteria



Mansour et al. JASE 2010

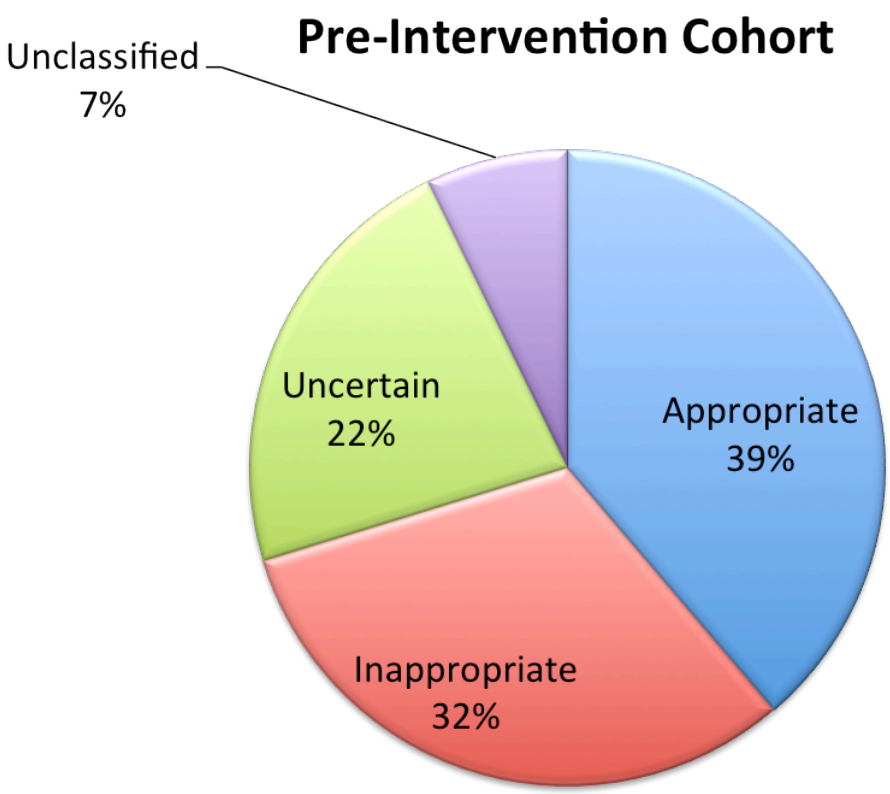
Appropriateness Ratings of 2008 and 2011 AUC in Stress Echo

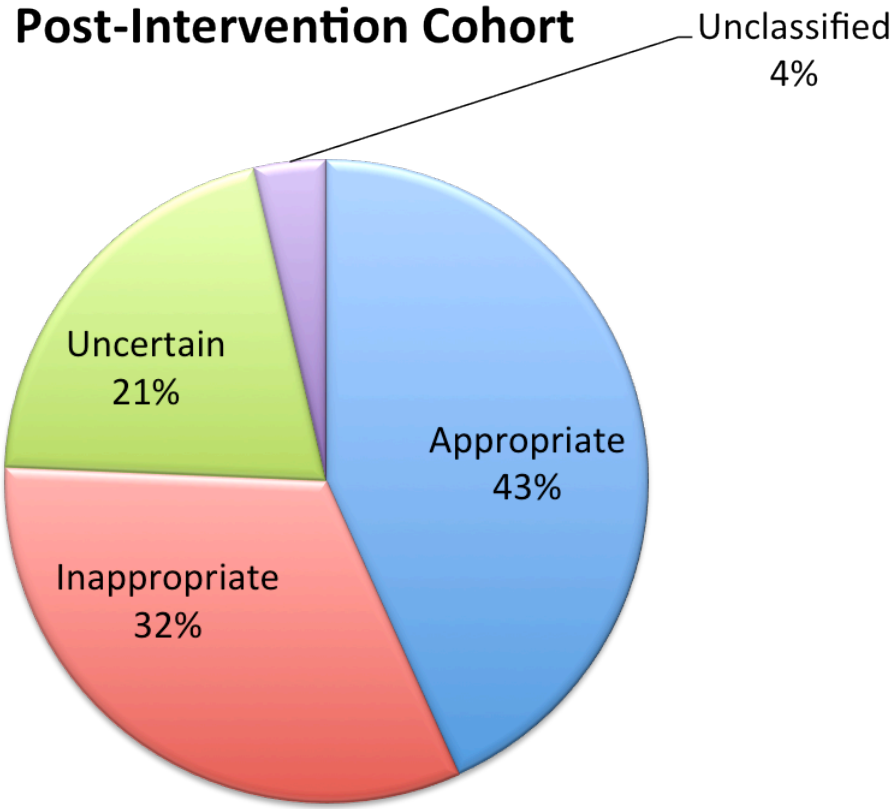




Willens et al. JACCimg 2013

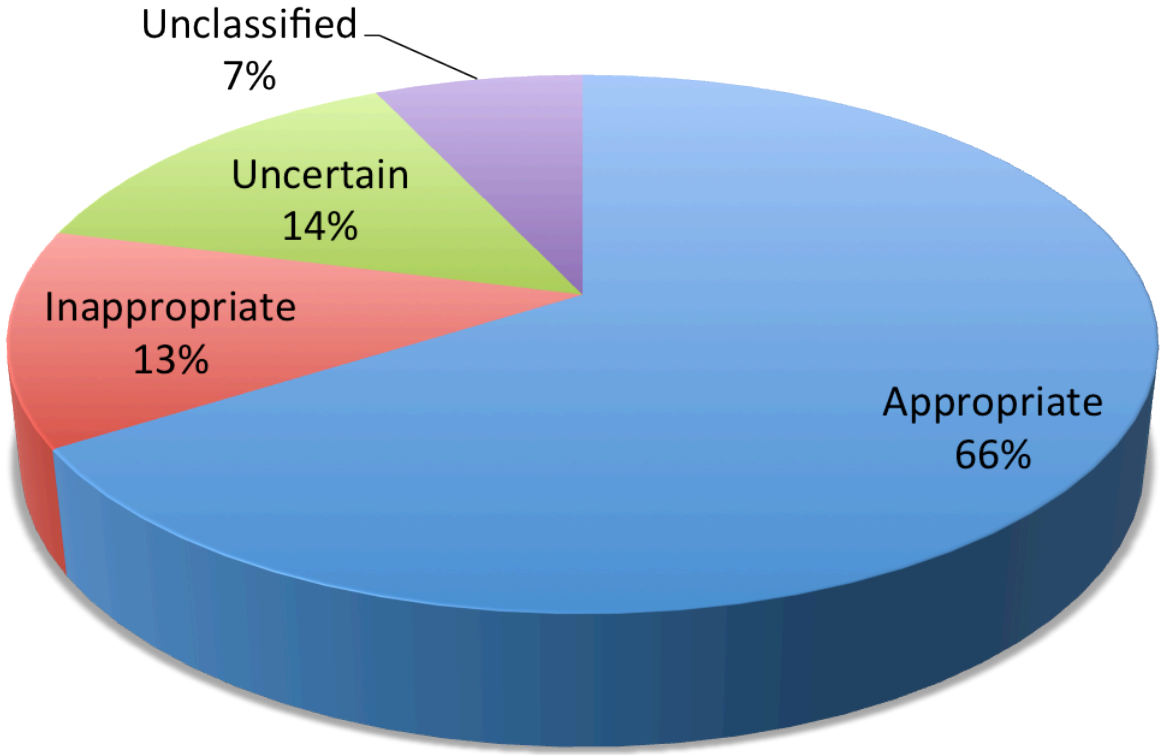
Impact of Education on Appropriateness Ratings





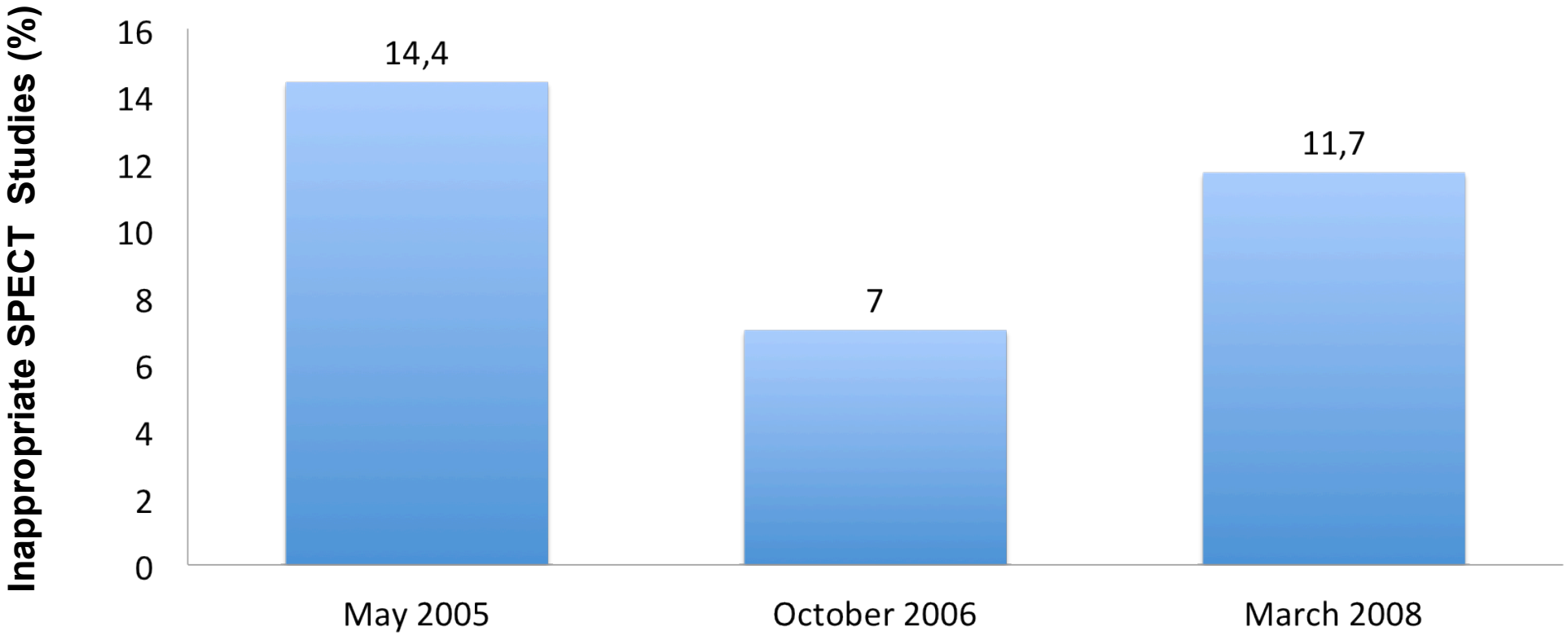
Willens et al. JACCimg 2013

SPECT AUC – Multicenter Assessment



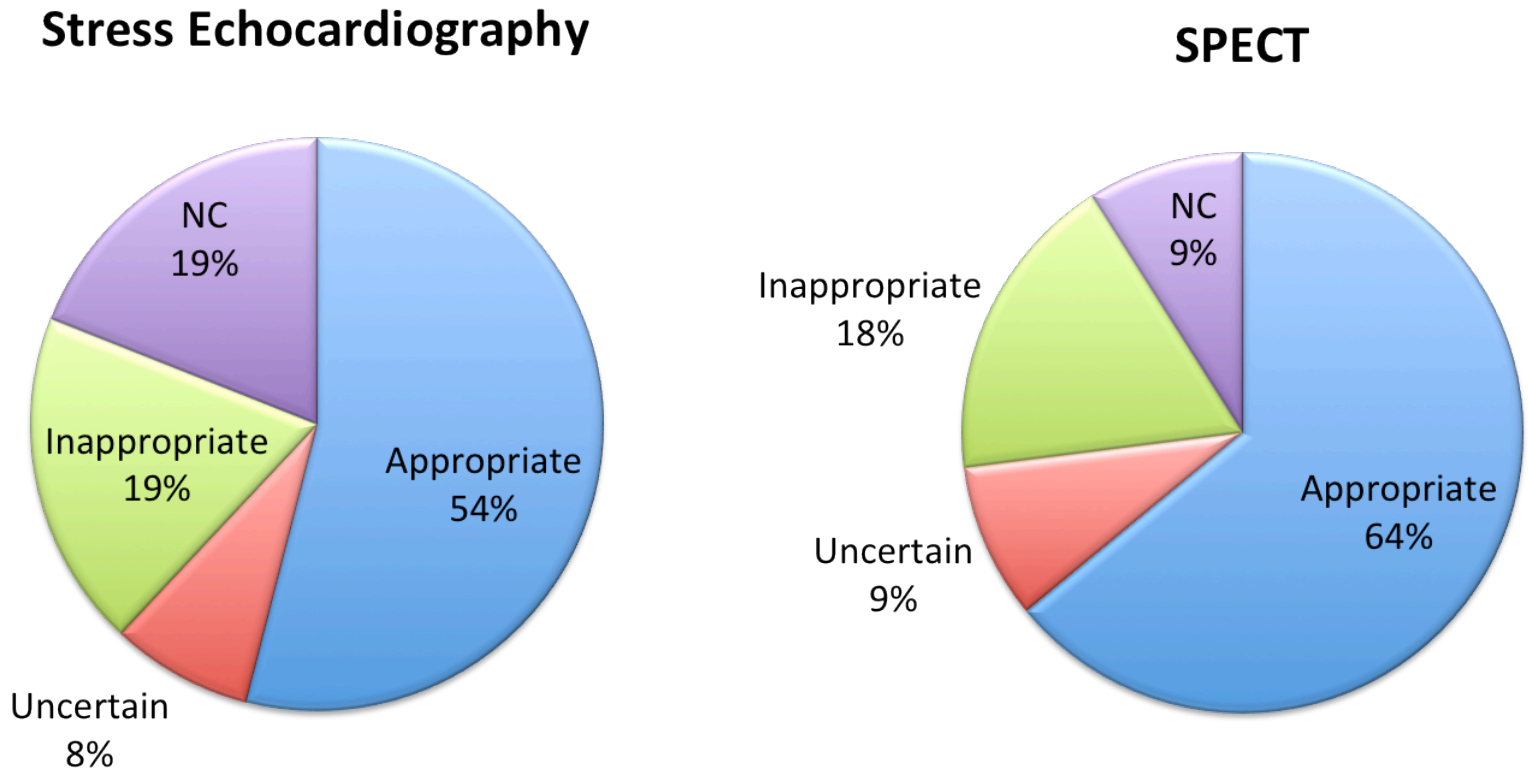
Hendel et al. JACCi 2010

Quality Improvement – Trend Over Time



Gibbons et al. Circulation 2010

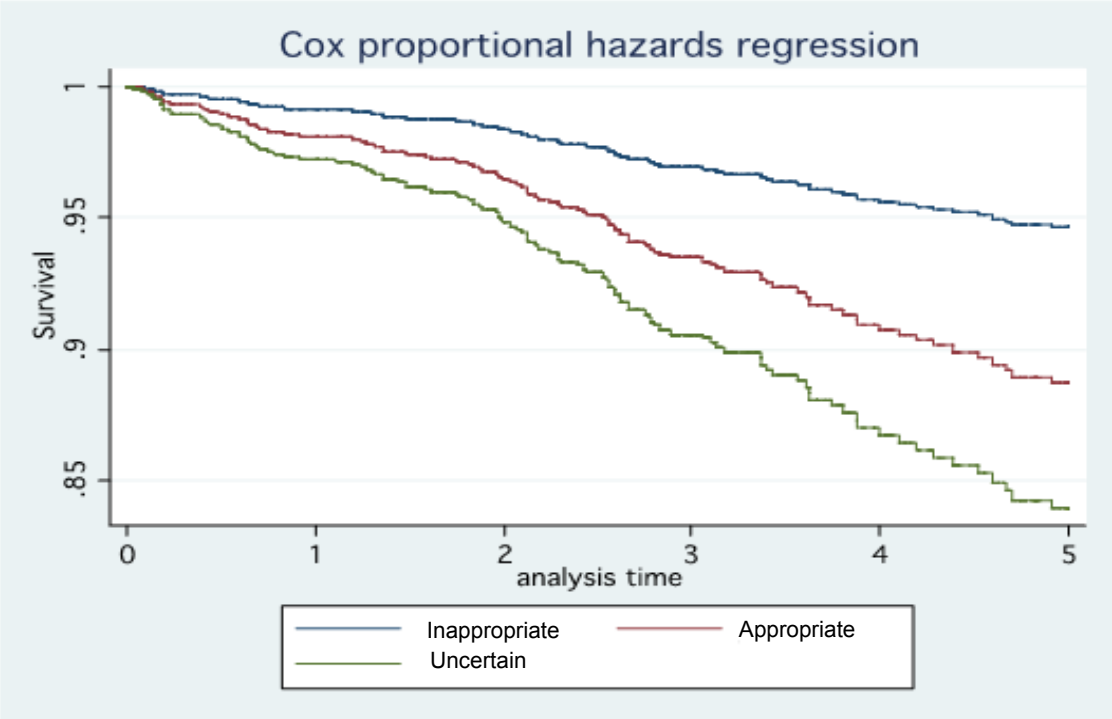
Appropriateness Criteria Stress Echo vs. SPECT



Stress Echo criteria are stricter

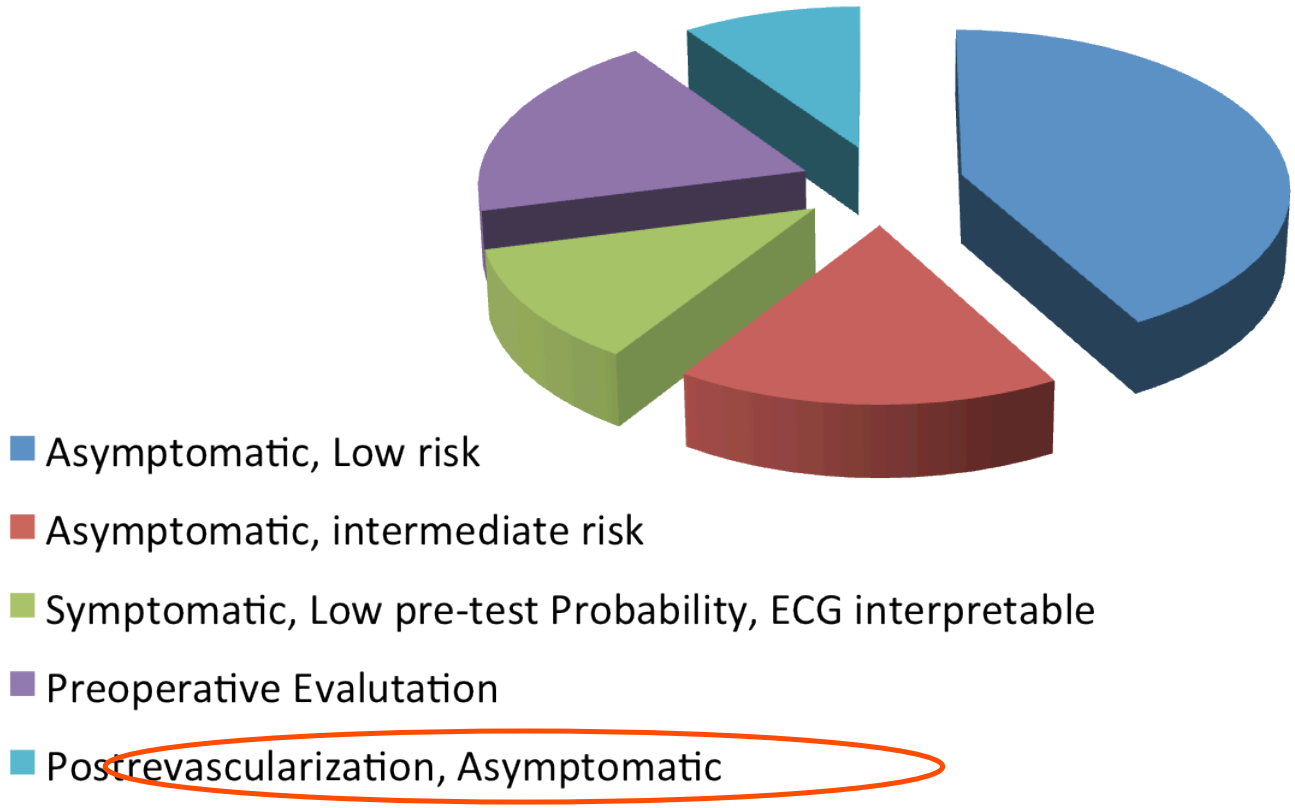
McCully et al. Circulation Cardiovascular Imaging 2009

Appropriateness Stress Echo Criteria and Outcome



Cortigiani L and Sicari Circulation Cardiovasc Img 2012

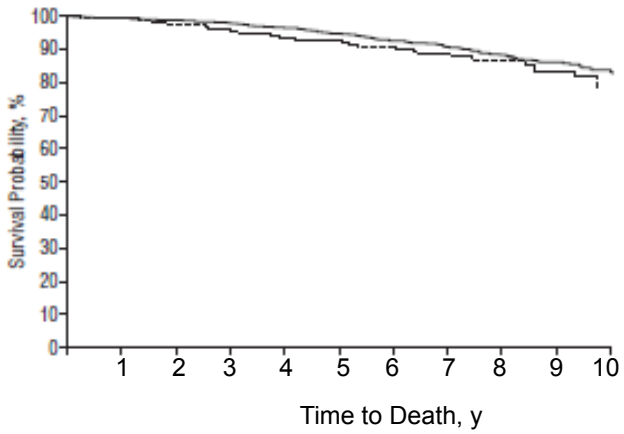
Inappropriate Referrals to Stress Echo



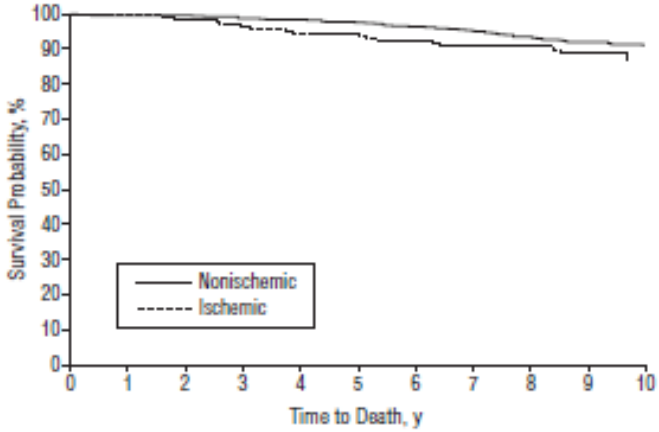
McCully et al. Circulation Cardiovascular Imaging 2009

The Overload of "Useless" Testing

TOTAL MORTALITY



CARDIAC MORTALITY



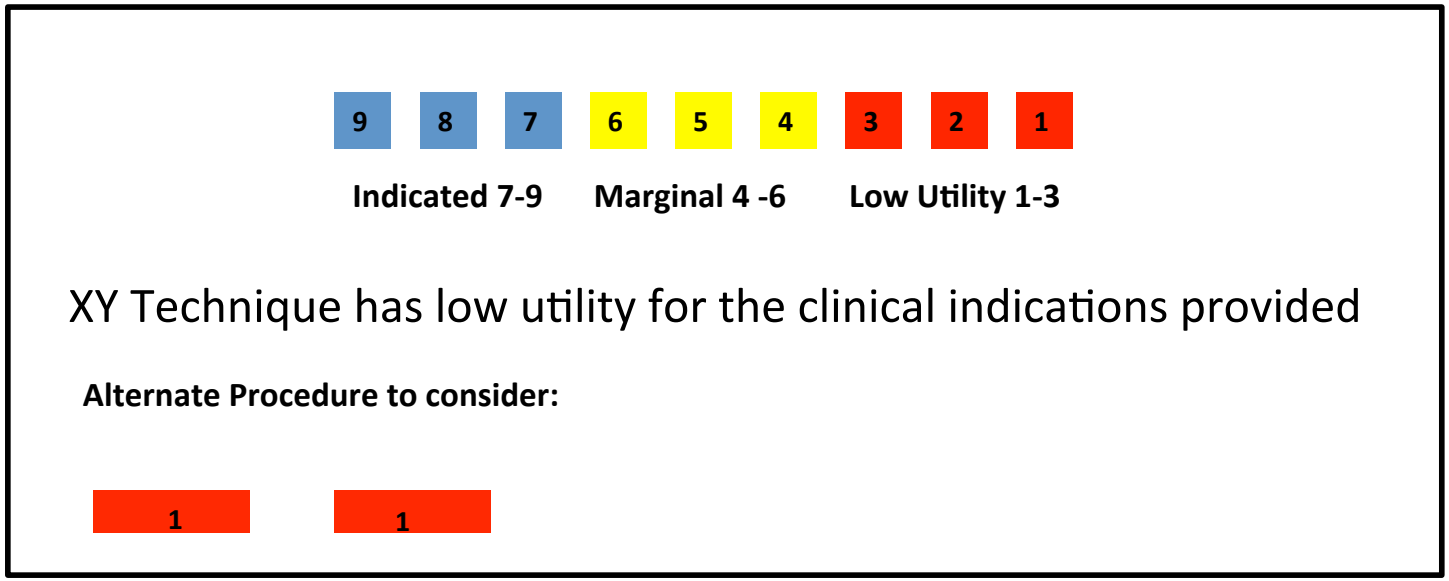
Harb SC, Marwick T. Arch Int Med 2012

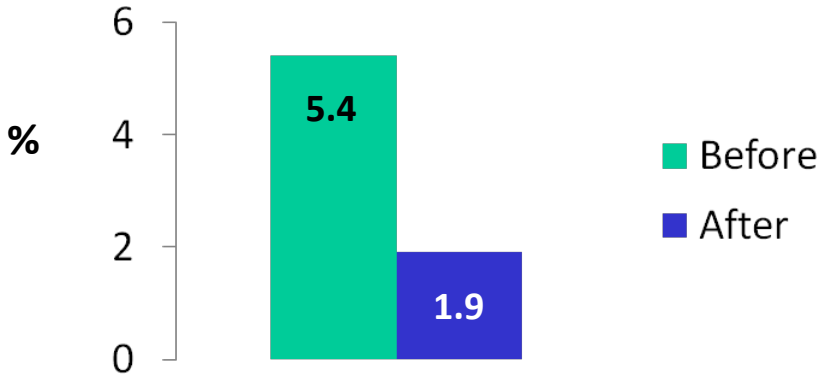
2

Don't perform annual stress cardiac imaging or advanced non-invasive imaging as part of routine follow-up in asymptomatic patients.

Performing stress cardiac imaging or advanced non-invasive imaging in patients without symptoms on a serial or scheduled pattern (e.g., every one to two years or at a heart procedure anniversary) rarely results in any meaningful change in patient management. This practice may, in fact, lead to unnecessary invasive procedures and excess radiation exposure without any proven impact on patients' outcomes. An exception to this rule would be for patients more than five years after a bypass operation.

A Barrier to Low-Yield CT, MR and Nuclear medicine

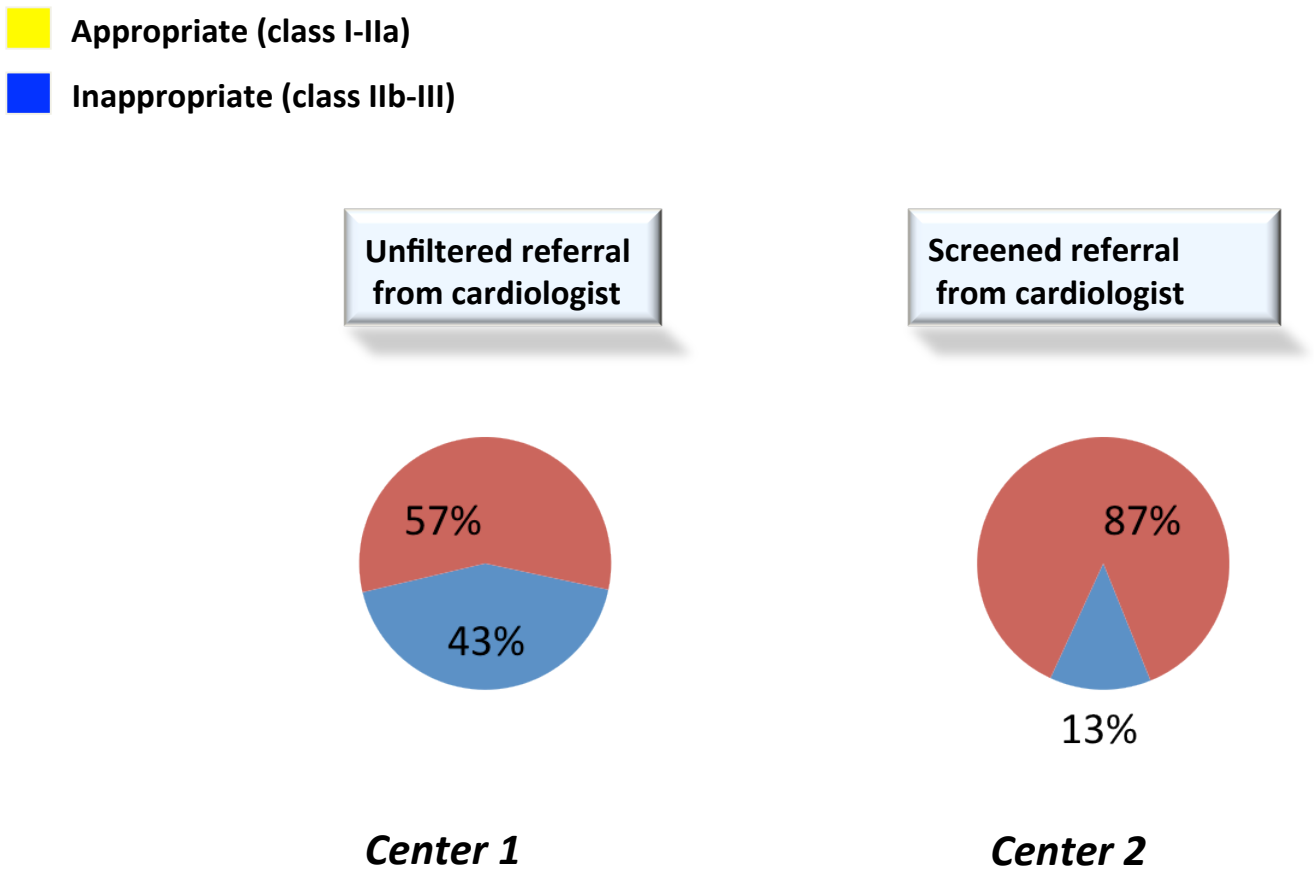




The probability that a low-yield request would be cancelled or abandoned was increased by 3.5-fold after the policy change

Vartanians VM et al. Radiology 2010

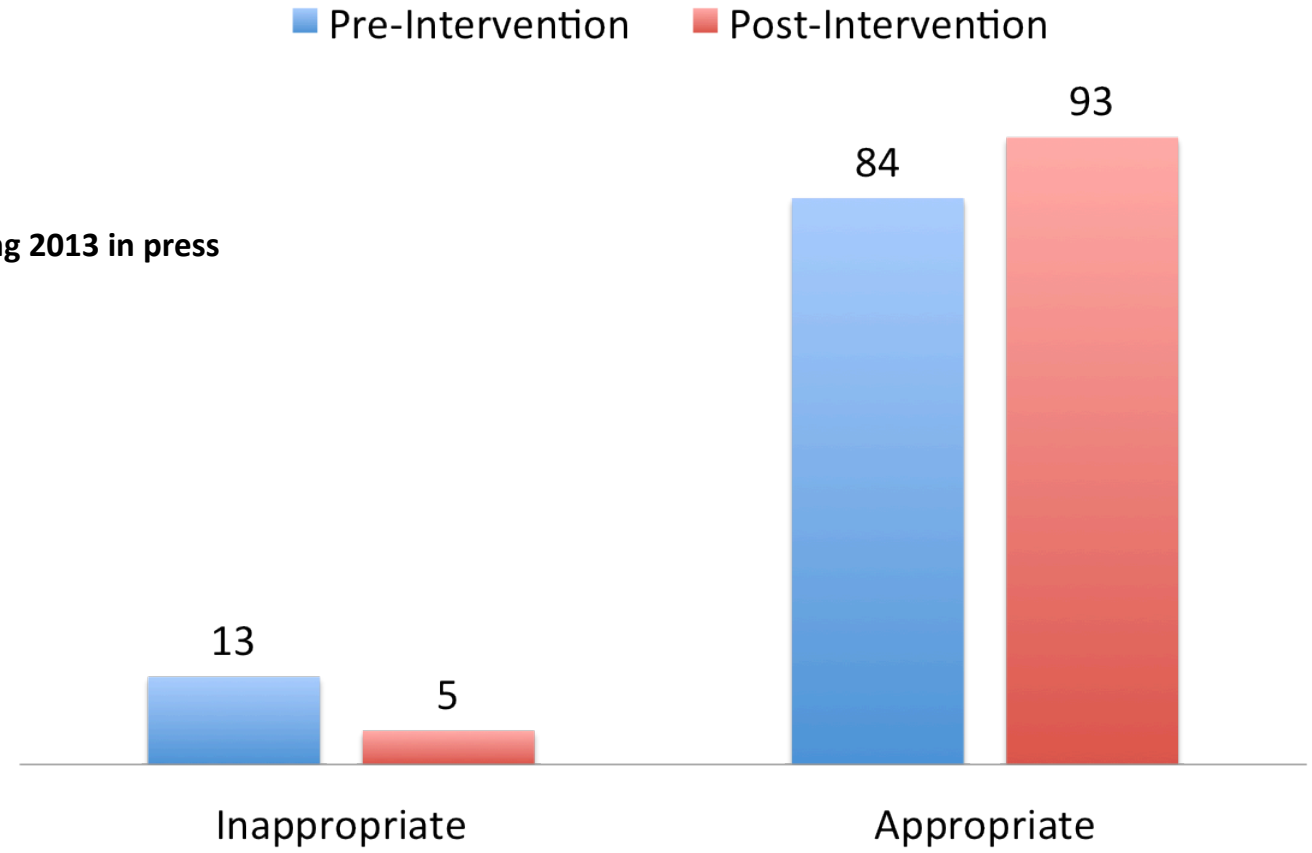
Interinstitutional differences based on AHA/ACC 2002/2003 guidelines



Picano. Am Heart J 2007;154:285

Educational Intervention reduces the Rate of Inappropriate Echocardiograms

Bathia et al. JaccImg 2013 in press



A lecture to house staff on the 2011 AUC for TTE; A pocket card that applied the AUC to common clinical scenarios; Bi-weekly e-mail feedback regarding ordering behavior

The NEW ENGLAND JOURNAL of MEDICINE

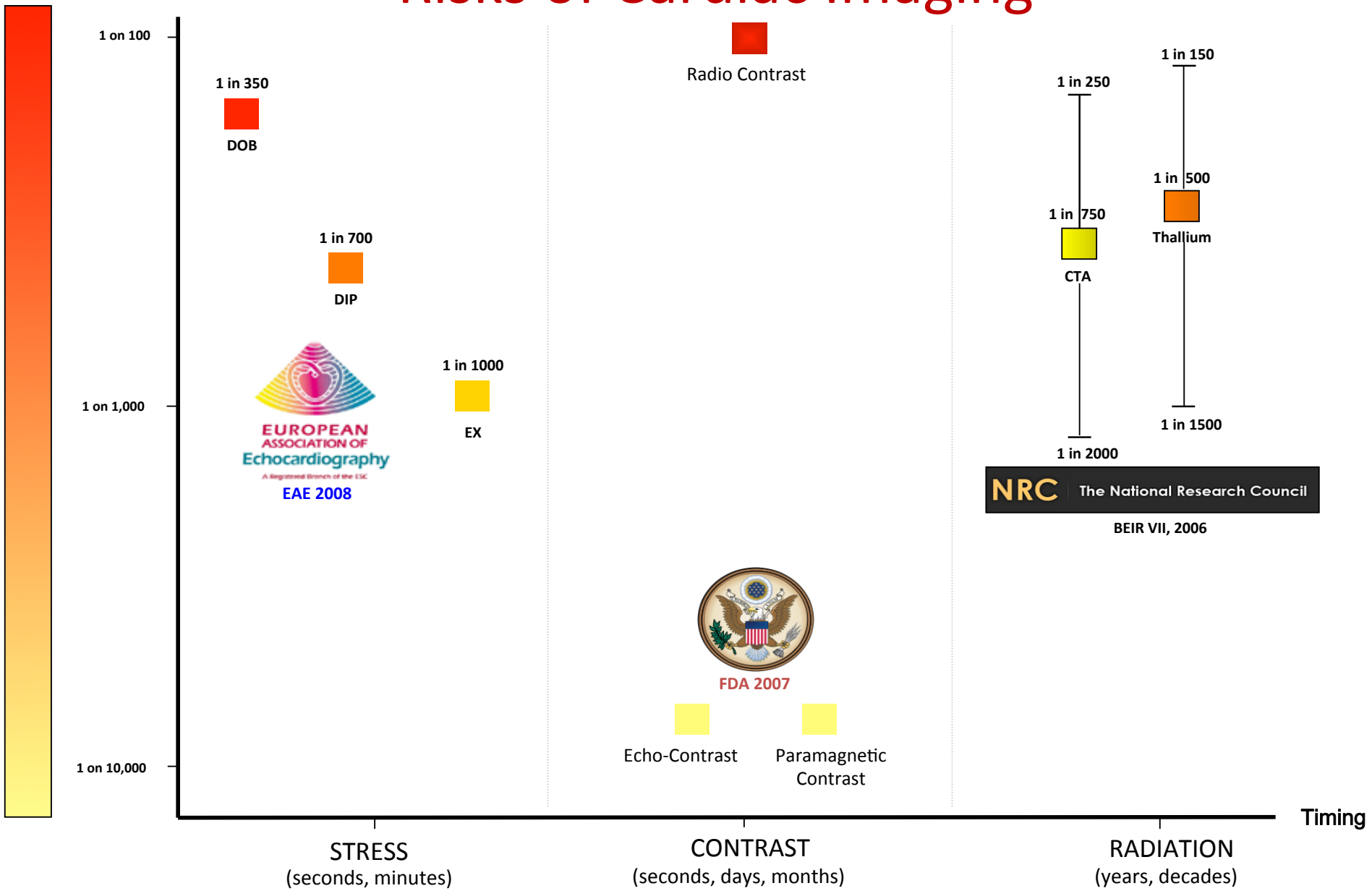
Perspective

The Uncritical Use of High-Tech Medical Imaging

Bruce J. Hillman, M.D., and Jeff C. Goldsmith, Ph.D.

- Evidence basis for using imaging is incomplete
- Much imaging practice is driven by habit or anectdote
- Enter the clinical practice with limited testing of their contribution to improving health
- The “me too” approach

Risks of Cardiac Imaging



The NEW ENGLAND JOURNAL of MEDICINE

Volume 357:2309-2311 November 29, 2008 Number 22

Pay Now, Benefits May Follow - The Case of CT Angiography

Rita F. Redberg, M.D., and Judith Walsh, M.D., M.P.H..

"The use of cardiac imaging has been increasing by 26% per year, despite a lack of evidence of outcome benefit. Without such evidence, a high-resolution cardiac CT angiographic image of the heart is just another pretty picture"

"What's making us Sick is an epidemic of Diagnoses"

A new goal for medical researchers:
reduce the need for medical services,
not increase it.

Welch GH, Schwartz L, Woloshin S. January 2, 2007