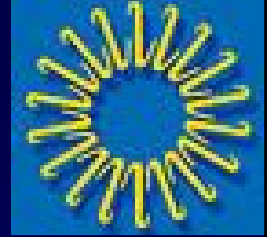




RIACC Primary Care Symposium



# Stress Myocardial Perfusion Imaging: When is It the Best Test?

James A. Arrighi, M.D.

*Associate Professor of Medicine*

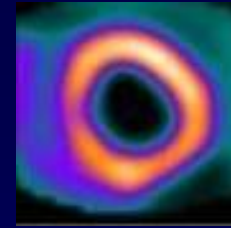
*Warren Alpert Medical School of Brown University*

*Director, Nuclear Cardiology, R.I. Hospital*

*Program Director, Cardiology Fellowship*

Disclosure: Astellas Pharma US (Speakers' Bureau)

# Nuclear Cardiology



## Clinical Roles

- Detection of CAD
- Prognostic assessment of patients with known or suspected CAD
- Assessment of etiology of chest pain (ED)
- Myocardial viability
- LV function

## Strengths

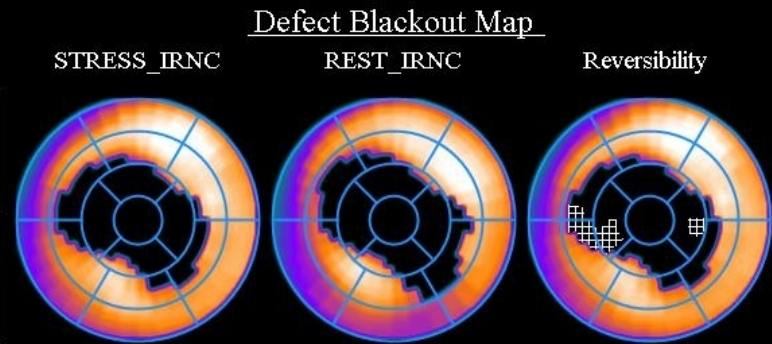
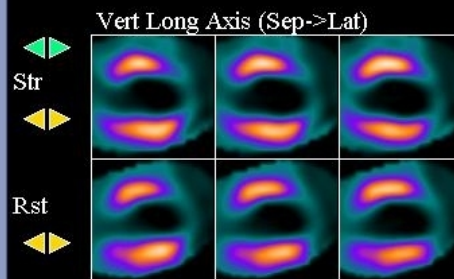
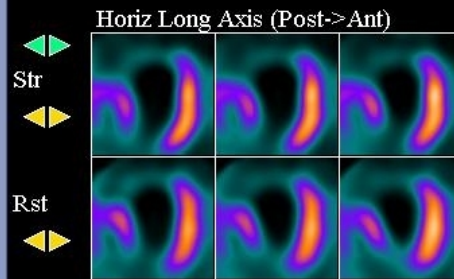
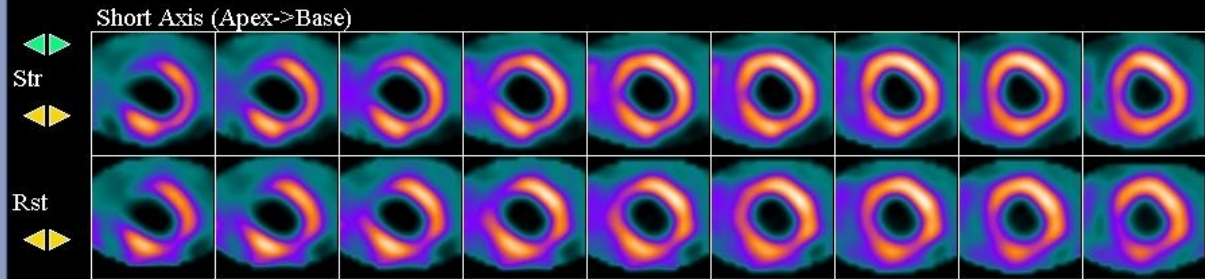
- Quantifiable
- Standardized
- Physiologic
- Evidence base
- Relevant in diverse patient populations
- Tracer principle

# Regular Dose, Fast Acquisition, CZT Camera

STRESS\_IRNC  
 20-Sep-2010 10:37:52  
 Intervals: 1  
 Pharma: Tc-99m  
 UgVol: 127 ml, TID: 0.98  
 SSS: 21  
 V2-GSRD/TC/NC/F

REST\_IRNC  
 20-Sep-2010 09:19:43  
 Intervals: 1  
 Pharma: Tc-99m  
 UgVol: 130 ml, TID: N/A  
 SRS: 21  
 V2-GSRD/TC/NC/F

Study Info

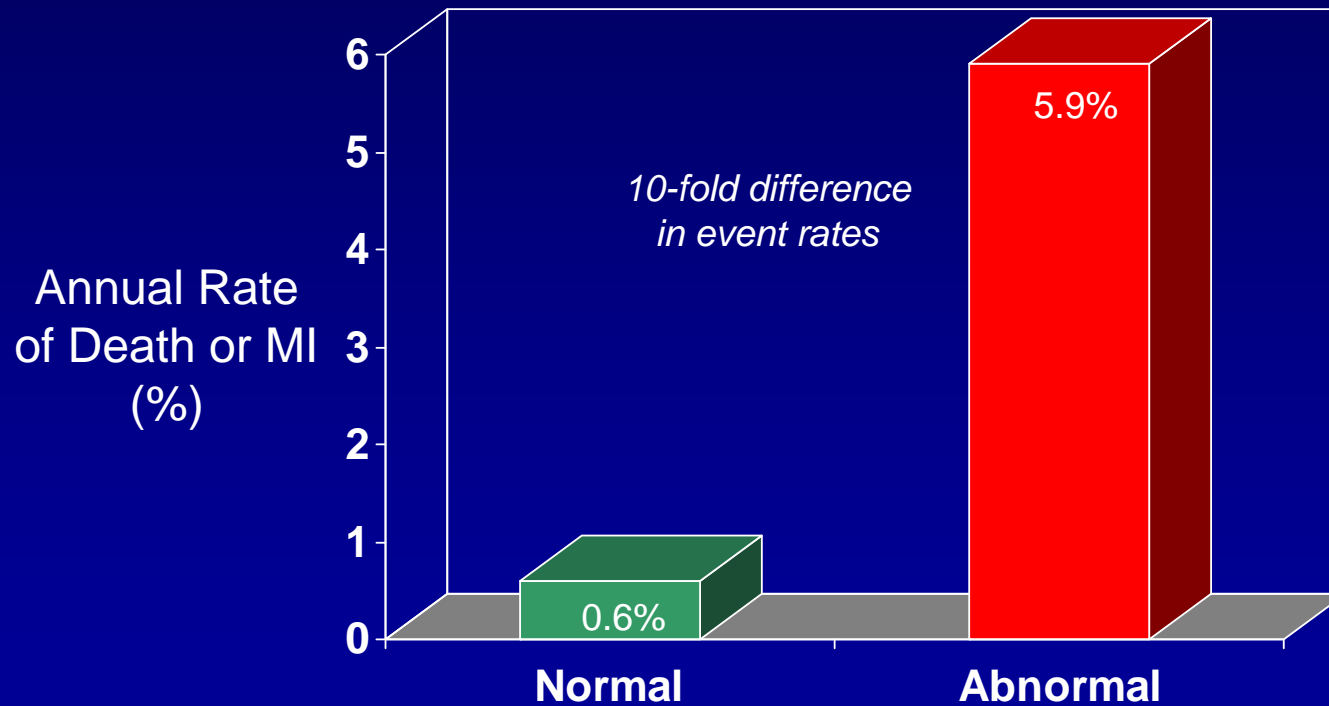


Perf: 0: Normal    1: Equivocal    2: Abnormal    3: Severe    4: Absent

# Risk Stratification with SPECT MPI

## Evidence Based Paradigm

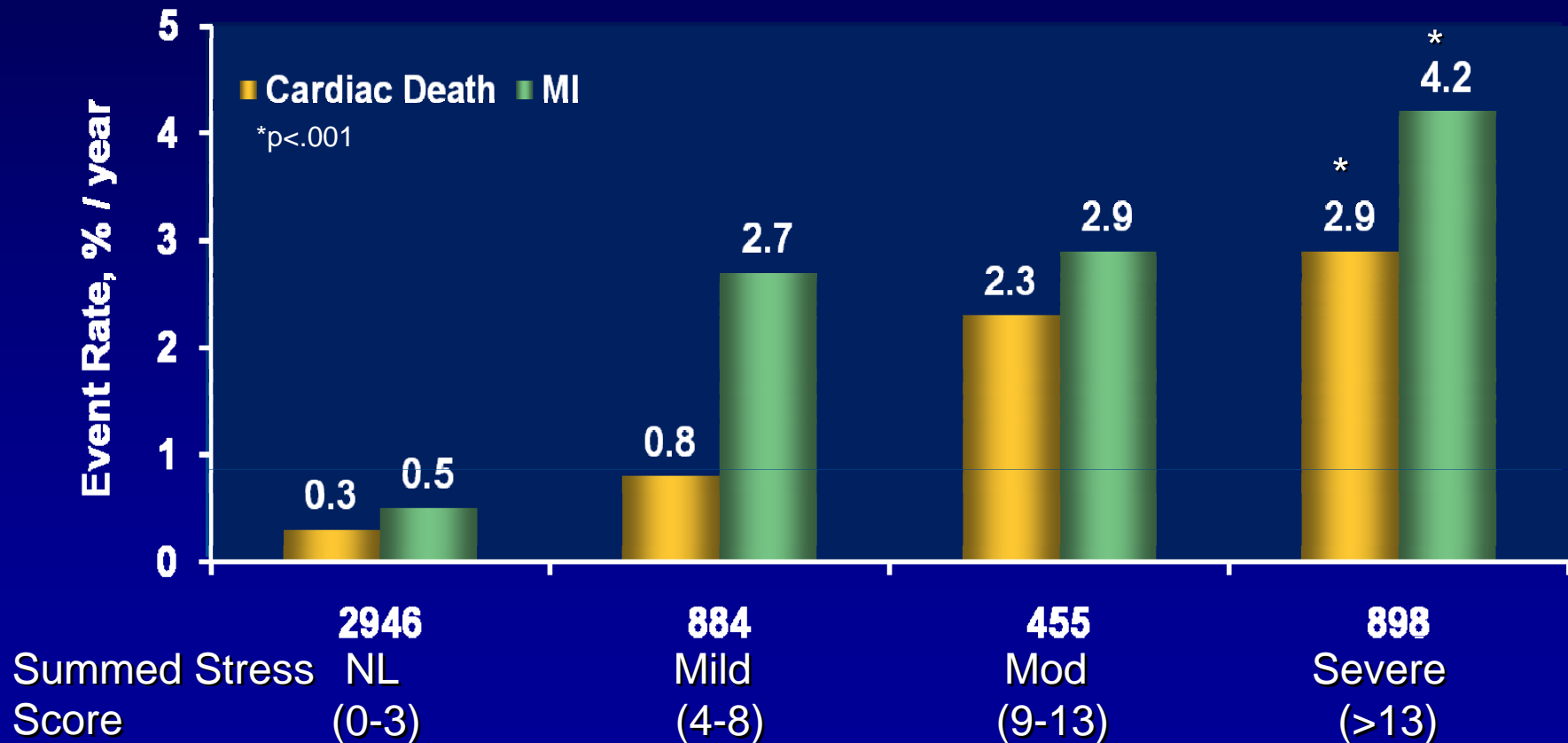
Suspected/Known CAD  
46 studies in 93,744 patients (1994-2003)



Shaw LJ and Iskandrian AE *J Nucl Cardiol* 2004;11:171-85

# Prediction of Cardiac Death & MI by Myocardial Perfusion SPECT Imaging

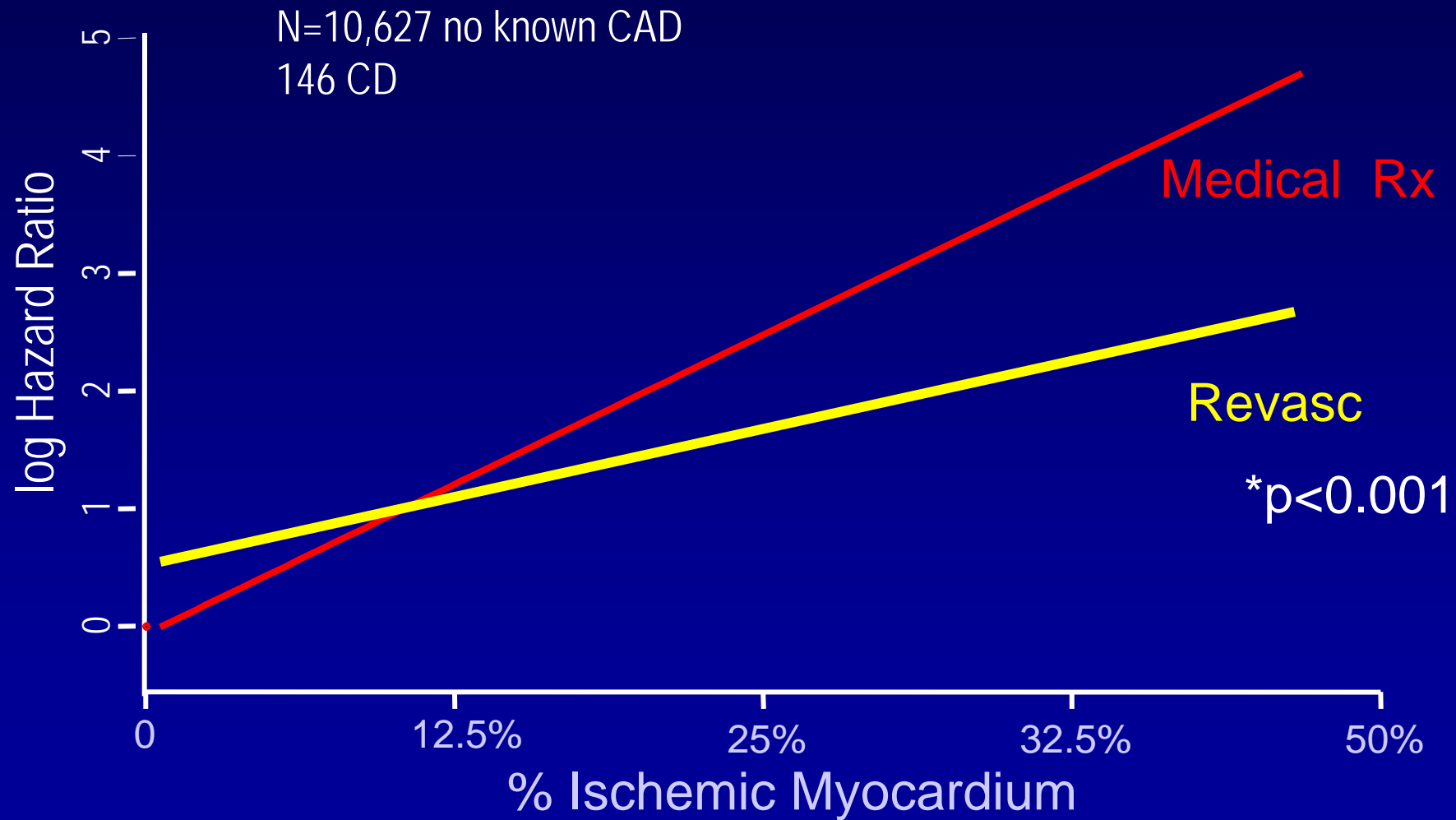
## Event Rate vs. Summed Stress Score



Source: Hachamovitch Circulation 1998;97:535-543.

# Risk of Cardiac Death & Inducible Ischemia

## Ischemia Predicts Benefit from Revascularization



Source: Hachamovitch Circulation 2003;107:2900-2907.

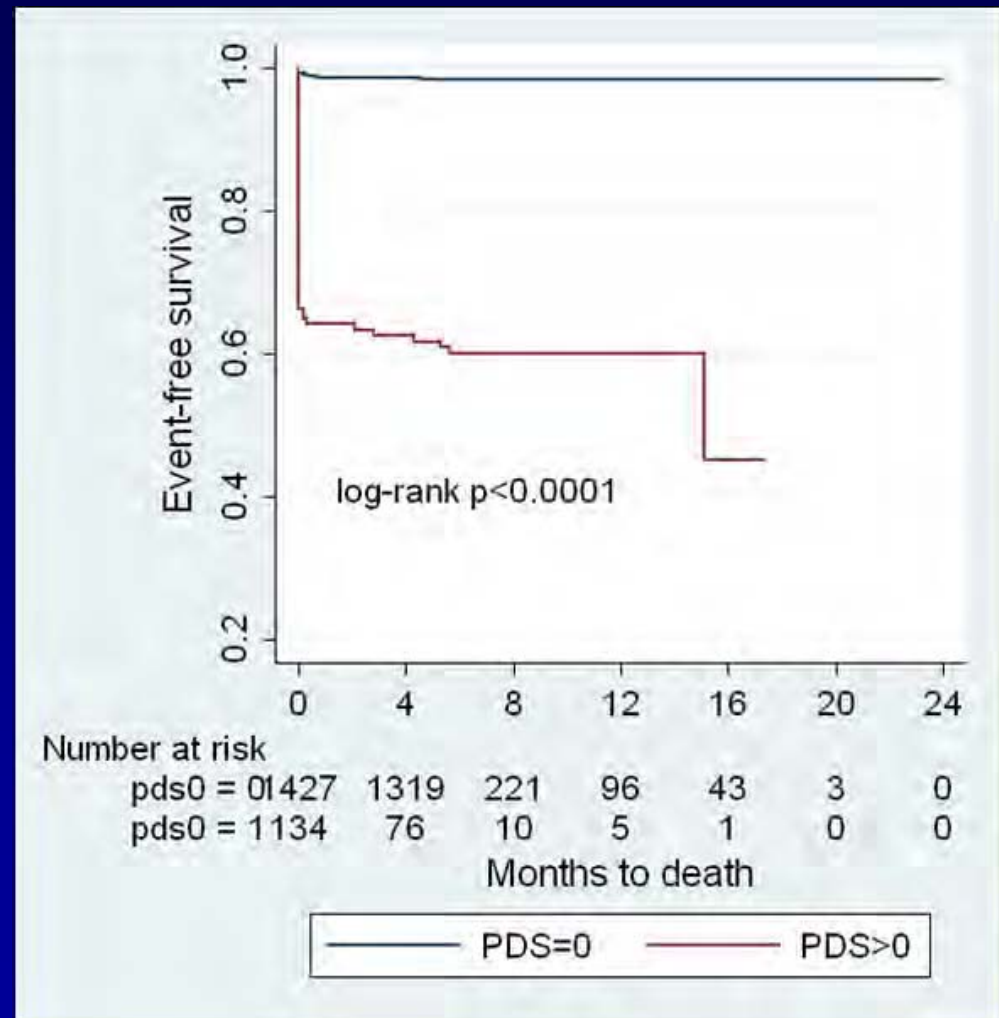
# The Patient with Acute Chest Pain

## Adenosine SPECT: A Contemporary View

- Prospective observational trial

1576 patients with ACP  
GSPECT within 24 hrs

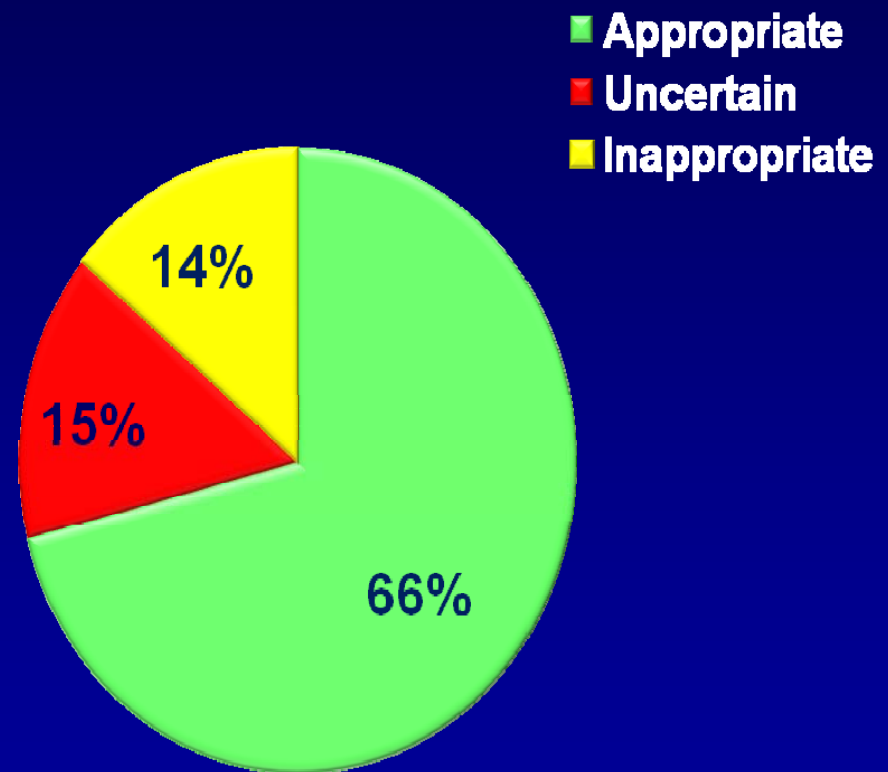
- 88.0% without CAD.
- Mean TIMI score was  $1.7 \pm 1$
- Adenosine stressor in 92%.
- Abnormal GSPECT in 8.6%
- F/U 7.3 months
- Event rate: 4.9%



# ACCF/ASNC/United Health Care Appropriate Use Project

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- Data collection from March 3-July 31, 2008
- 5,928 studies
- 423 unclassified

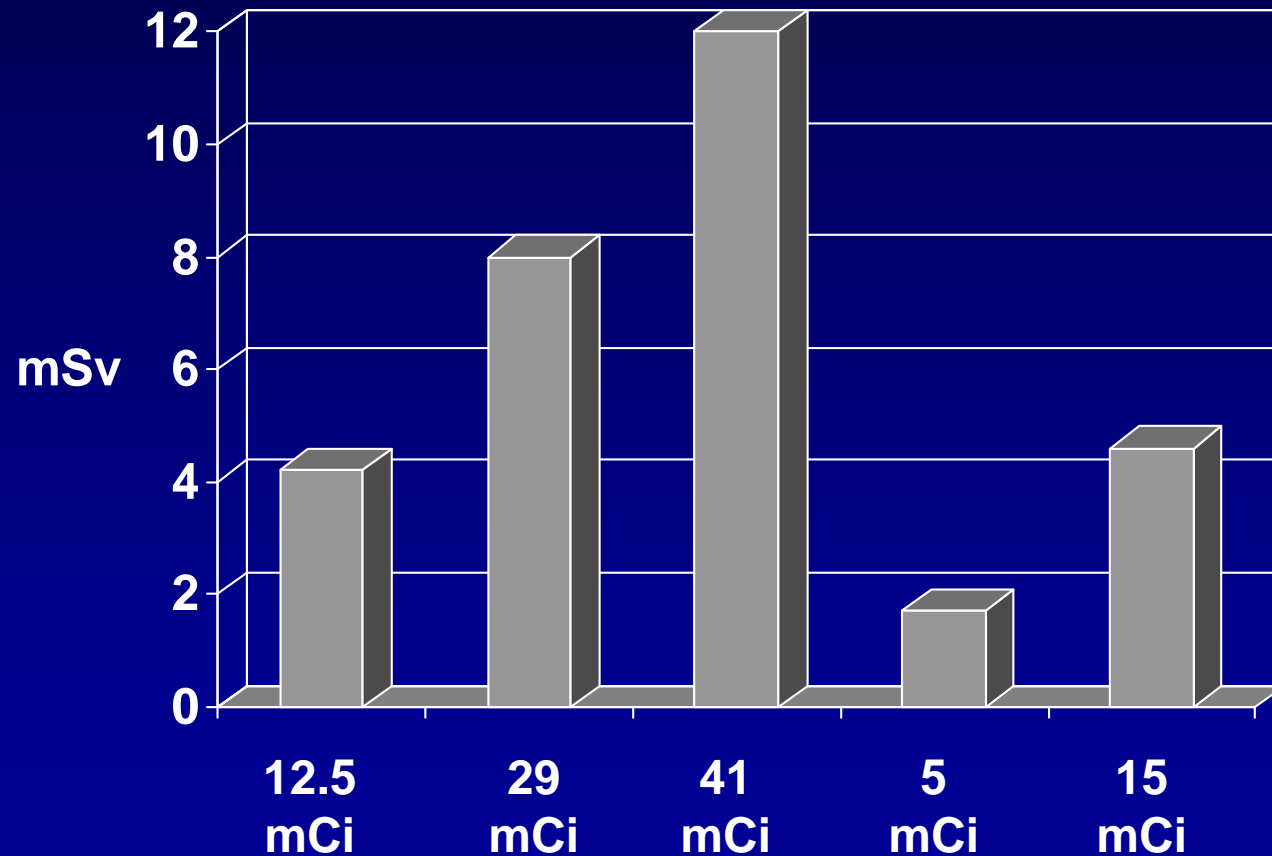


Source: Hendel JACC 2010;.55:156-162.

# Radiation Risk



# Effective Dose Estimates

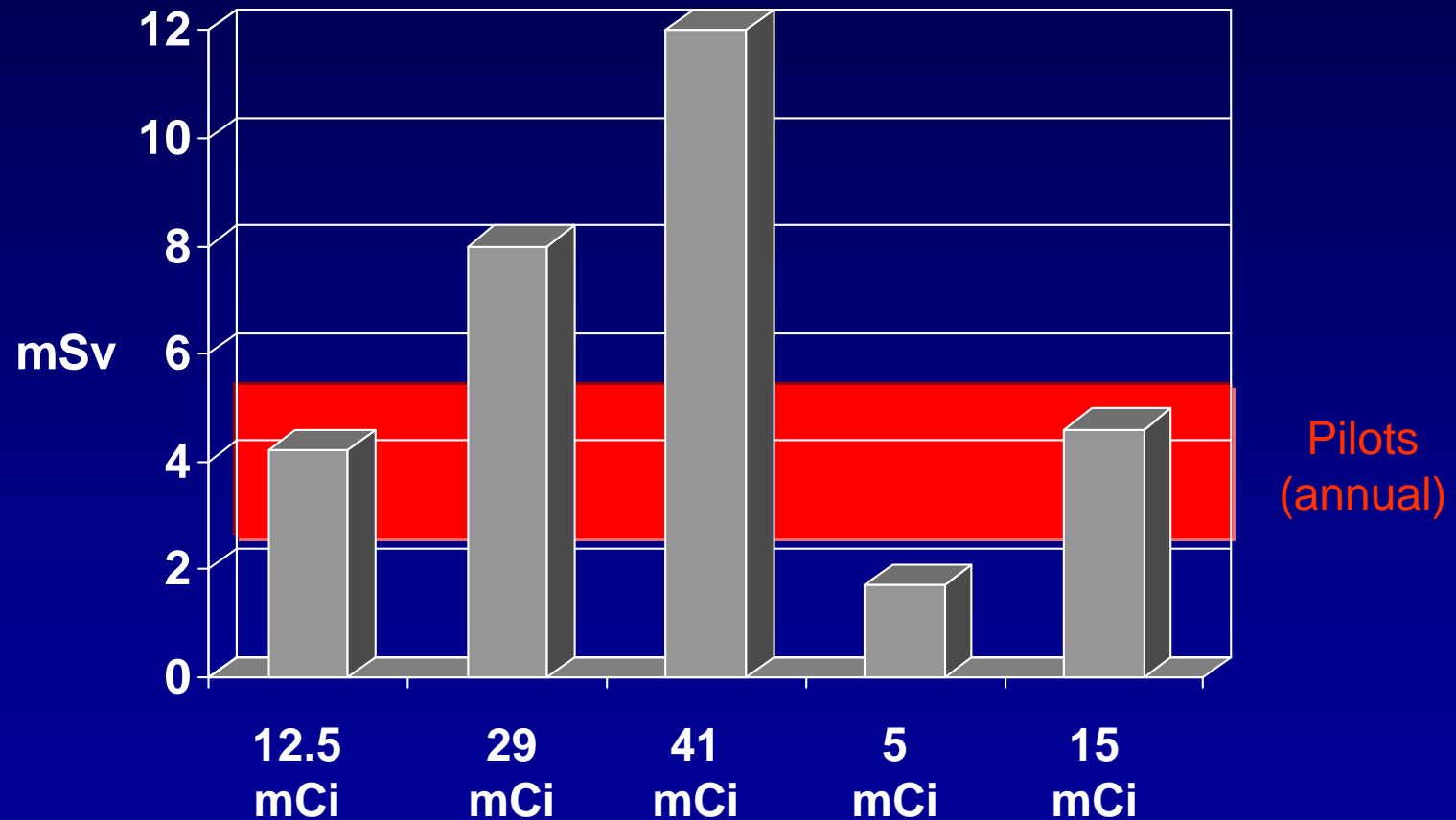


Conventional 

New Cameras 

Estimates based on Duval et al, JNC 2010

# Effective Dose Estimates



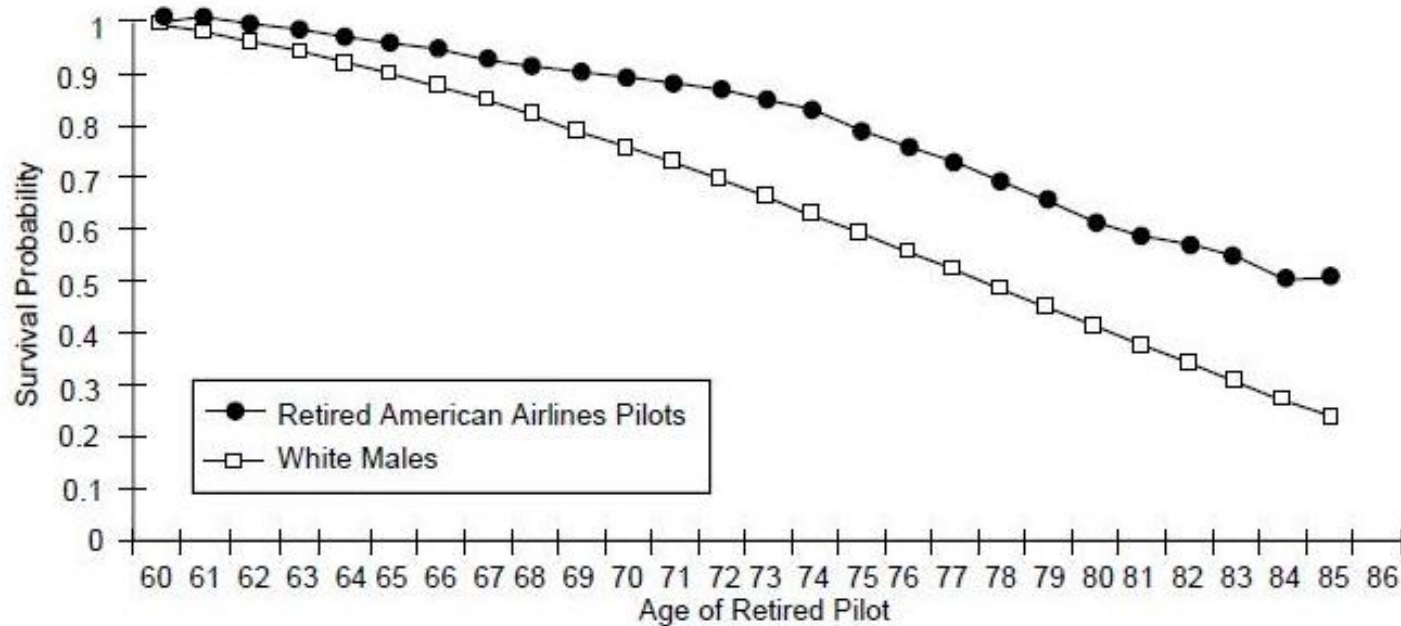
Conventional

New Cameras

Estimates based on Duval et al, JNC 2010

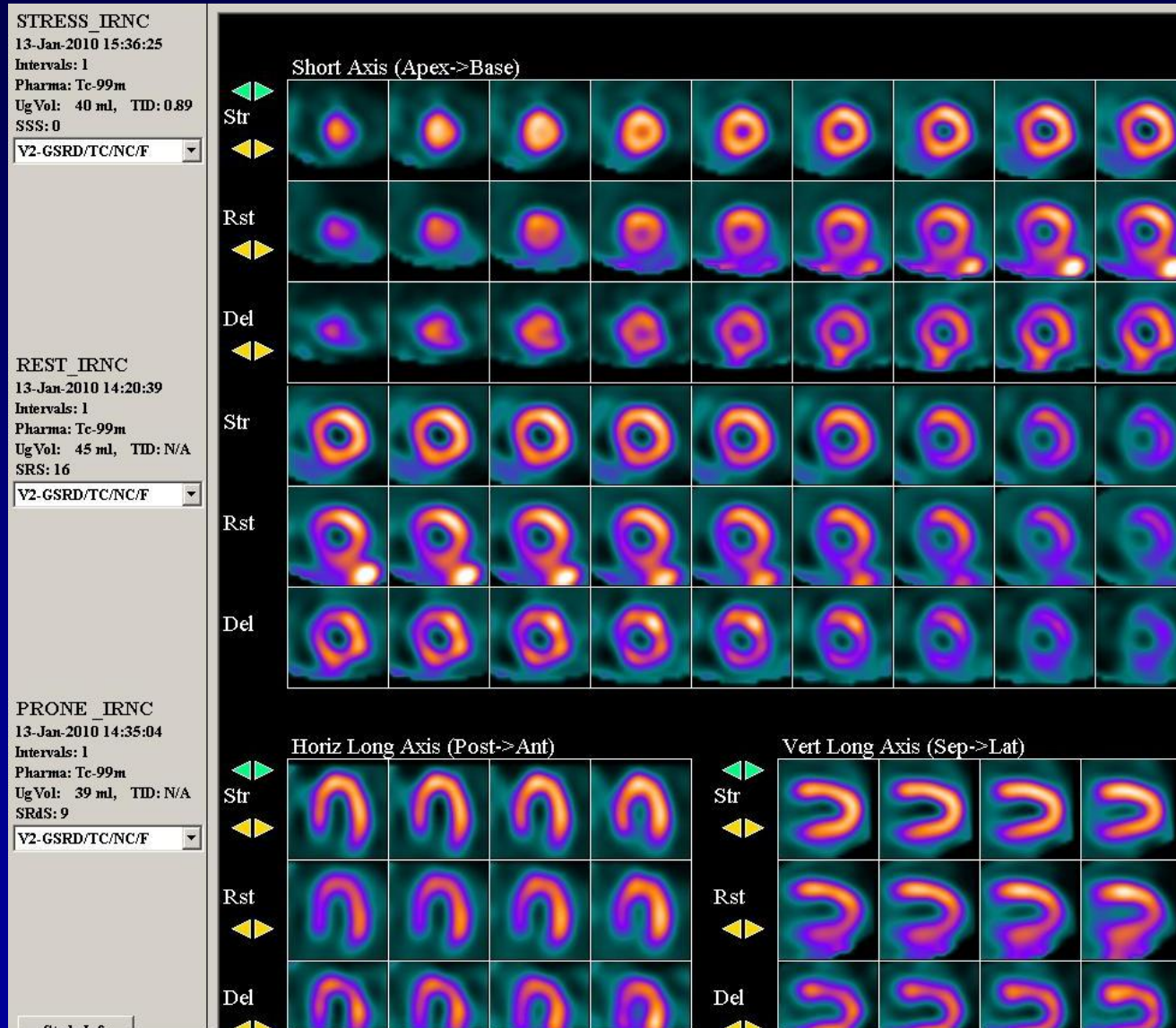
# Survival of Pilots Compared to General Population

Survival Probability Curve of Pilots Retired During April 1968 Through June 1993, Compared with 60-year-old U.S. White Males in General Population



Source: U.S. Federal Aviation Administration

# Reduced Dose, CPU Patient, CZT Camera



# Which Test for Which Patient?

“I wish I had an answer to that, because I am tired of answering that question.”

Yogi Berra

# Which Test for Which Patient?

Upcoming consensus documents will stress importance of physician decision rather than strict algorithm

## Echo

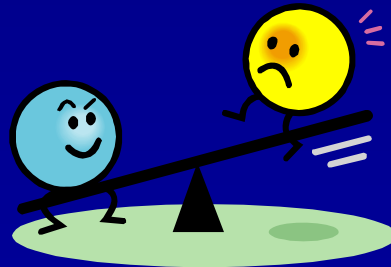
Younger

Lower risk

## Nuclear

Known CAD

Higher risk



# The Future: The Next Level of Quantification

Flow reserve by PET predicts MACE independent of visible perfusion defects (SSS).

