Real Life vs. Appropriate Use Criteria in Stress Echocardiography

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Appropriate Use Criteria (AUC)

- Developed by the ACC, AHA and other relevant societies (Echo, stress echo, MPI, Cardiac CT etc)
  - Revised on regular basis
  - Replace the practice guidelines
- Rand methodology by panel of experts
- Score 51 separate clinical indications 1 – 9 (inappropriate to appropriate)
- Grouped as Appropriate (7-9), Uncertain (4-6) and Inappropriate (1-3)
- Lab survey of adherence will be part of ICAEL process

Which Patients Need Imaging?

- Suspect false positive / false negative
  - Conduction abnormality / LBBB
  - Baseline ST-segment shifts
  - Hypertension / LVH
  - Female patients (????)
  - Concurrent non-coronary disease
- Localization needed
- Prognosis
- Viability

Napa 2010 #13

- 63 YO female
- Anterior MI 3 years prior
  - No antecedent symptoms
  - Urgent cath: single vessel LAD disease: DES
- Currently active and asymptomatic, but no organized exercise

2851

Napa 2010 #13

- A stress echocardiogram is appropriate for surveillance
  - A = yes
  - B = no

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Application of Stress Echocardiography Appropriate Use Criteria: 2008

- Patients following PCI
  - Asymptomatic prior to PCI, < 2 years out
    - Inappropriate
  - Symptomatic prior to PCI, < 2 years out
    - Inappropriate
  - Asymptomatic prior to PCI, > 2 years out
    - Uncertain
  - 2009 AUC for perfusion imaging has same recommendations

Napa 2010 #13

- 10:00 Cornell protocol
  - Stopped for fatigue
  - NSST-T at baseline, 1.5 mm additional STD

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Stress Echo

- A. Anterior MI – no ischemia
- B. Anterior MI – LAD ischemia
- C. Anterior MI – multivessel ischemia
- D. Anterior MI – posterior ischemia
- E. Combined CAD and nonischemic cardiomyopathy

Patients Post Revascularization / ACS

Appropriate

- 33. ACS not planning cath
- 35 Delayed onset chest pain S/P revascualrization

- **Uncertain:**
  - 36, 37. > 5 years S/P CABG with or without prior symptoms
  - 41. > 2 years S/P PCI without prior symptoms

Inappropriate

- 34. ACS, asymptomatic S/P revascularization
- 36. Asymptomatic < 5 years post CABG
- 39, 40. < 2 years post PCI with or without prior symptoms

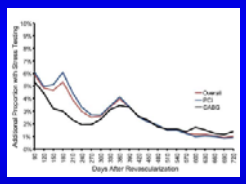
Patterns of Cardiac Stress Testing After Revascularization in Community Practice

- Claims database study over 3 year period
- Revascularization in 28,177 (PCI in 21,046)
- Screen for post revascularization stress test
  - ≥ 1 stress test in 59% within 24 months
    - 11% had repeat cath and 5% revascularization

BR Shah et al, JACC 2010

Patterns of Cardiac Stress Testing After Revascularization in Community Practice

- Indication for stress:
  - Ischemic HD 73%
  - Angina or CP 29%
- Overall 36% rate of stress testing
- 50% variation based on region of practice



BR Shah et al, JACC 2010

MSE 2011

- 26 YO female graduate student
  - Random, fleeting left chest pain
  - Physically active, runner, soccer
- PMHx:
  - No major illnesses
  - Meds: OCP
- Physical exam: Normal
- ECG: Normal

MSE 2011: 26 YO Female

- Next step
  - A. Stress echo
  - B. Coronary CTA
  - C. Nuclear perfusioin study
  - D. Nothing

MSE 2011: 26 YO Female Next Step

- A. Coronary arteriogram
- B. Nuclear perfusion study
- C. Coronary CTA
- D. Treat with beta blockers
- E. Nothing

Appropriate Use Criteria in Asymptomatic Patients

Population	Test	Appropriate
Asymptomatic / low CHD risk	CT angiogram	NO
Asymptomatic / low CHD risk	Calcium scoring	No
Asymptomatic / low CHD risk	Stress echocardiogram	No
Asymptomatic / low CHD risk	Myocardial perfusion / SPECT	No

Asymptomatic Patients

Appropriate

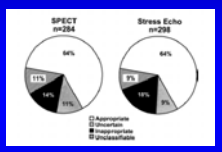
- 14. Moderate CHD risk, abnormal LV Fxn
- 18. Moderate CHD risk with Afib or VT-NS
- 25. Agatston score >400

Inappropriate

- 11, 12. Low and moderate CHD risk (Uncertain for high risk)
- 20. Annual reevaluation after prior normal study (Uncertain if high risk and at >2 years)
- 22. Stable or asymptomatic with known CAD ≤ 1 year (uncertain at 2 years)

Application of Appropriateness Criteria to Stress Single-Photon Emission Computed Tomography Sestamibi Studies and Stress Echocardiograms in an Academic Medical Center

- Single center retrospective review of adherence to AUC
- Identical analysis for Stress Echo and SPECT perfusion.
- Evaluated 2005 AUC
- Repeat with 2009 AUC reduced Unclassifiable cases



48% of Inappropriate studies were in asymptomatic low risk patients

Gibbons et al, JACC 2008

MSE 2011: 44 YO Male

- Six week history of exertional chest pain
  - Variable level of stress to provoke
  - Recreational runner, recreational tennis
  - Duration 1 – 25 minutes
- PMHx: Controlled HTN and lipids
- FHx: father with CABG age 72
- ECG: borderline LVH, minor NSST changes

MSE 2011: 44 YO Male Next Step

- A. Cardiac cath
- B. Coronary CTA
- C. EBCT for calcium score
- D. Stress echo
- E. Vasodilator perfusion study

MSE 2011: 44 YO Male

- Criteria #4:
  Patient with chest pain (angina or equivalent) in intermediate probability of CAD and uninterpretable ECG
- Stress Echocardiography (or MPI) are:

Appropriate (9)

"Typically" Symptomatic Patients

Appropriate

- 2 -6. Low, intermediate and high CHD risk with angina or equivalent symptoms
- 7. Intermediate risk CHD, acute chest pain with negative markers
- 9. New onset HF with intermediate CHD risk and normal LVF
- Appropriate – continued
- 23. Worsening symptoms in patient with prior abnormal study
- 27. Presence of equivocal coronary stenosis (CTA etc)
- **Inappropriate**
- 8. High CHD risk, acute pain and positive markers

AUC in Real Life: Conclusions

- Useful guide to timing and appropriateness of testing in broad range of clinical situations.
  - Evidence and opinion based
- Some complex patients are not represented
- Assessment of adherence to AUC is now part of ICAEL lab accredidation