Helping
Cardiovascular
Professionals
Learn.
Advance.
Heal.

Practitioners' View of Utilization Management in Cardiac Imaging:

Development, Implementation and Evaluation of Appropriate Use Criteria

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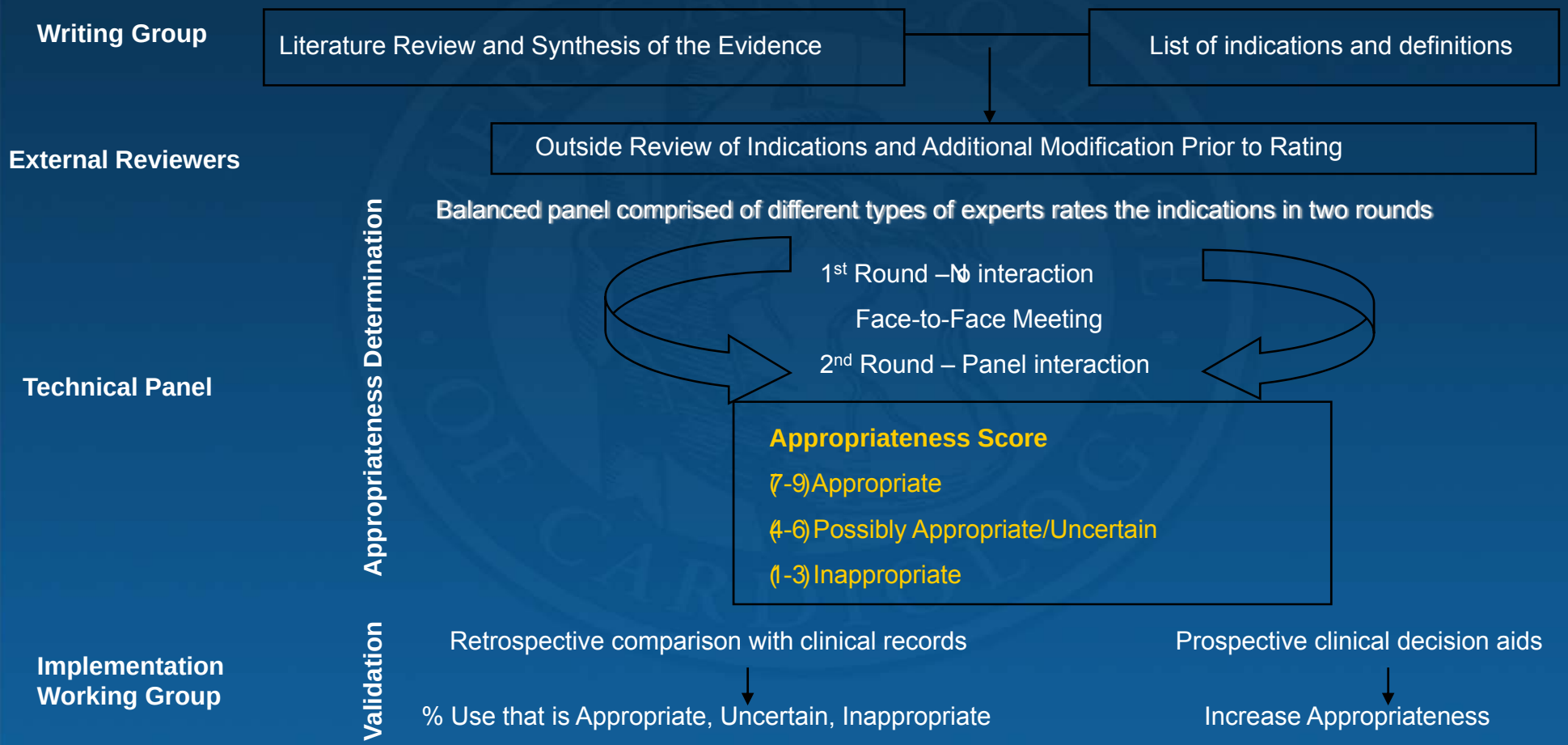
Challenge of Managing Imaging Growth

- Acknowledge growth in imaging – includes both *potential* overuse and underuse
- Current radiology benefit manager approach reviews individual cases
  - Non-transparent criteria
  - *Resource demanding*, time intensive
  - Little opportunity for understanding practice patterns
  - Interferes with physician/patient relationship (access)

Why ACCF Appropriate Use Criteria?

- Improve utilization of resource-intensive tests and procedures
  - Developed by physicians/providers
  - Literature-based (when possible) approach
  - Initial focus on advanced diagnostic cardiac imaging
  - Expansion to revascularization, potential for other procedures
- Focused reduction of procedures based on clinical value and practice patterns, not indiscriminant volume reduction
- Facilitates continuous quality improvement though education and feedback
- Preserves patient/provider relationship
- Provides for continued patient access

Appropriate Use Criteria Methodology



Adapted from Fitch K, et al. The RAND/UCLA Appropriateness Method User's Manual, 2001

Publications

- √ Nuclear cardiology (SPECT MPI)
  October 2005
- √ Cardiac CT/MR
  September 2006
- √ Echocardiography (Transthoracic/Transesophageal)
  June 2007
- √ Echocardiography (Stress)
  December 2007
- Revascularization (PCI and CABG)
  December 2008 (In Press)
- Revised SPECT Criteria (in preparation)
- CV imaging cross modality (efficiency) evaluation

Implementation and Evaluation

- Development of methodology and publication of Criteria is not enough to ensure change in clinical practice
- Formation of AUCIE (Appropriate Use Criteria Implementation and Evaluation) Working Group, with leadership teams
  - Education/Communication (Kim Williams)
  - Implementation Tools (electronic) (Michael Mirro)
  - Databases and Registries (James Min)
  - CMS Demonstration Pilot Proposal (Eric Peterson)
  - Performance Measurement Development (Robert Hendel)
- ACCF/United Healthcare SPECT Appropriateness Pilot
- MIPPA mandate for Appropriateness Criteria Demo

Evaluation of Appropriateness

	Appropriate	Uncertain	Inappropriate
Hendel, 2006	83%	6%	11%
Williams, 2006	78%	5%	8%
Ayyad, 2007	85%	5%	10%
Druz, 2007	57%	33%	10%
Gaztanega, 2007	55%	28%	17%
Al-Mallah, 2007	75%	12%	13%
Gibbons, 2008	64%	11%	14%

ACCF/ASNC & United Healthcare Partnership
Pilot Project Goals

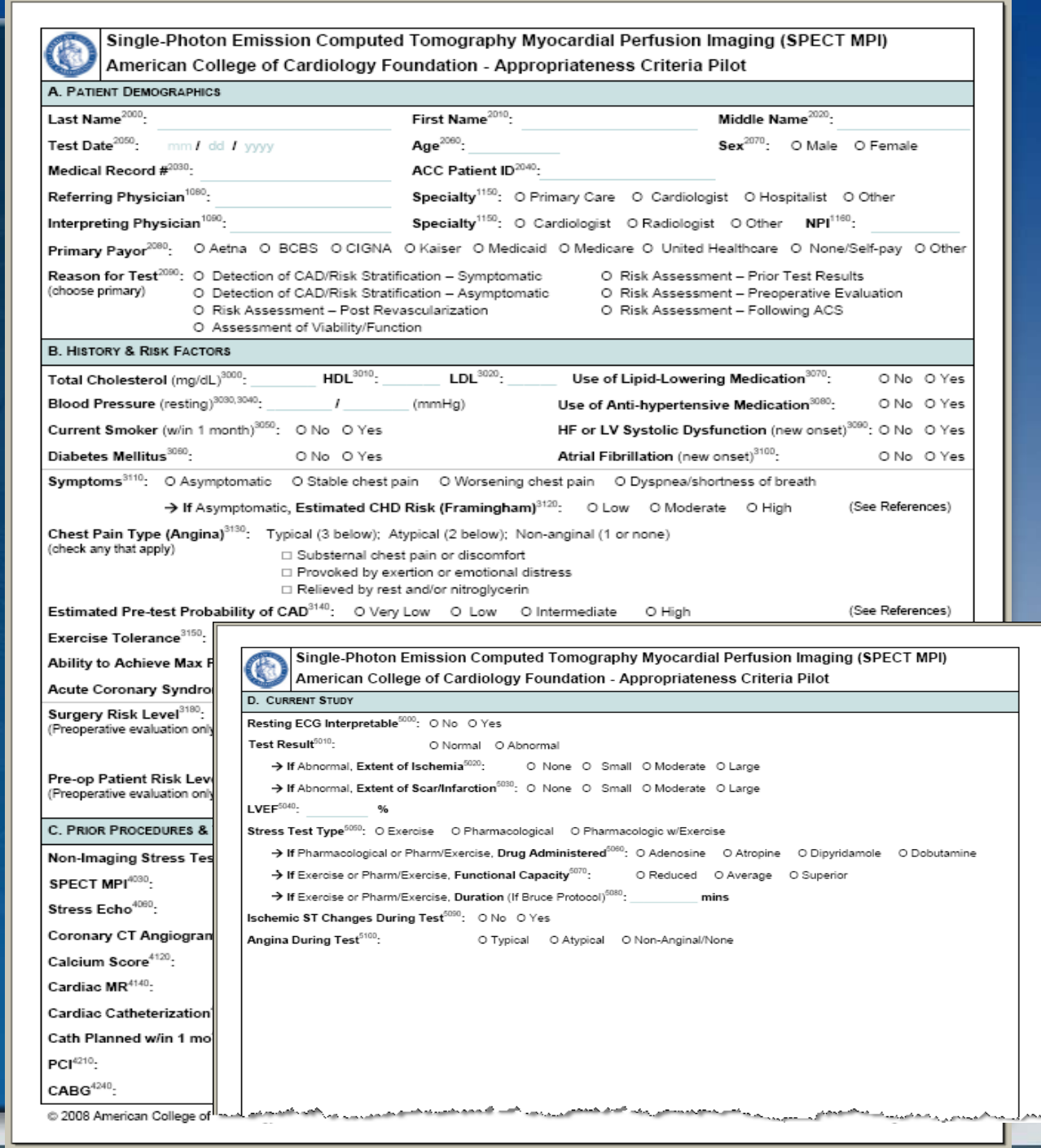
- Quality Improvement
  - Effective patient care
  - Efficient care
- Assess Validity of Appropriateness Criteria
  - Provide data for revisions/updates
  - Determine threshold levels of performance
- Assess Practice Patterns
  - Feedback to practice & individual physician
  - Identify areas for improvement
- Analysis of Decision Making
  - Correlation of level of appropriateness and image findings/patient outcome
- Alternative to Prior Notification/Prior Authorization

Pilot Project Methodology

- Sites
  - 7 participating sites
  - Cross-country geographic representation from Oregon to Florida
- Data Collection
  - Collected at imaging facility and feedback on practice patterns sent by sites to referring physicians
  - **ALL** SPECT MPI patients at participating practices
  - Collected on paper form and entered online at practice site
  - Collect data to evaluate appropriate use and test result
- Education and Feedback
  - Practice pattern reports
  - Change behavior at point of order with education and tools

Data Collection Form

- Front page
  - Patient demographics
  - History & risk factors
  - Prior procedures & tests
- Back page
  - Current study
  - Reference section
- Designed to be completed in one minute or less



Single-Photon Emission Computed Tomography Myocardial Perfusion Imaging (SPECT MPI)
American College of Cardiology Foundation - Appropriateness Criteria Pilot

A. Patient Demographics

Last Name[2000]: First Name[2010]: Middle Name[2020]:
Test Date[2050]: mm / dd / yyyy Age[2060]: Sex[2070]: O Male O Female
Medical Record #[2030]: ACC Patient ID[2040]:
Referring Physician[1080]: Specialty[1150]: O Primary Care O Cardiologist O Hospitalist O Other
Interpreting Physician[1090]: Specialty[1150]: O Cardiologist O Radiologist O Other NPI[1160]:
Primary Payor[2080]: O Aetna O BCBS O CIGNA O Kaiser O Medicaid O Medicare O United Healthcare O None/Self-pay O Other
Reason for Test[2090]: (choose primary)
O Detection of CAD/Risk Stratification – Symptomatic
O Detection of CAD/Risk Stratification – Asymptomatic
O Risk Assessment – Post Revascularization
O Assessment of Viability/Function
O Risk Assessment – Prior Test Results
O Risk Assessment – Preoperative Evaluation
O Risk Assessment – Following ACS

B. History & Risk Factors

Total Cholesterol (mg/dL)[3000]: HDL[3010]: LDL[3020]: Use of Lipid-Lowering Medication[3070]: O No O Yes
Blood Pressure (resting)[3030,3040]: / (mmHg) Use of Anti-hypertensive Medication[3080]: O No O Yes
Current Smoker (w/in 1 month)[3050]: O No O Yes HF or LV Systolic Dysfunction (new onset)[3090]: O No O Yes
Diabetes Mellitus[3060]: O No O Yes Atrial Fibrillation (new onset)[3100]: O No O Yes
Symptoms[3110]: O Asymptomatic O Stable chest pain O Worsening chest pain O Dyspnea/shortness of breath
→ If Asymptomatic, Estimated CHD Risk (Framingham)[3120]: O Low O Moderate O High (See References)
Chest Pain Type (Angina)[3130]: (check any that apply) Typical (3 below); Atypical (2 below); Non-anginal (1 or none)
☐ Substernal chest pain or discomfort
☐ Provoked by exertion or emotional distress
☐ Relieved by rest and/or nitroglycerin
Estimated Pre-test Probability of CAD[3140]: O Very Low O Low O Intermediate O High (See References)
Exercise Tolerance[3150]:
Ability to Achieve Max F
Acute Coronary Syndro
Surgery Risk Level[3180]: (Preoperative evaluation only)
Pre-op Patient Risk Lev (Preoperative evaluation only)

C. Prior Procedures &

Non-Imaging Stress Tes
SPECT MPI[4030]:
Stress Echo[4060]:
Coronary CT Angiogran
Calcium Score[4120]:
Cardiac MR[4140]:
Cardiac Catheterization
Cath Planned w/in 1 mo
PCI[4210]:
CABG[4240]:

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Single-Photon Emission Computed Tomography Myocardial Perfusion Imaging (SPECT MPI)
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D. Current Study

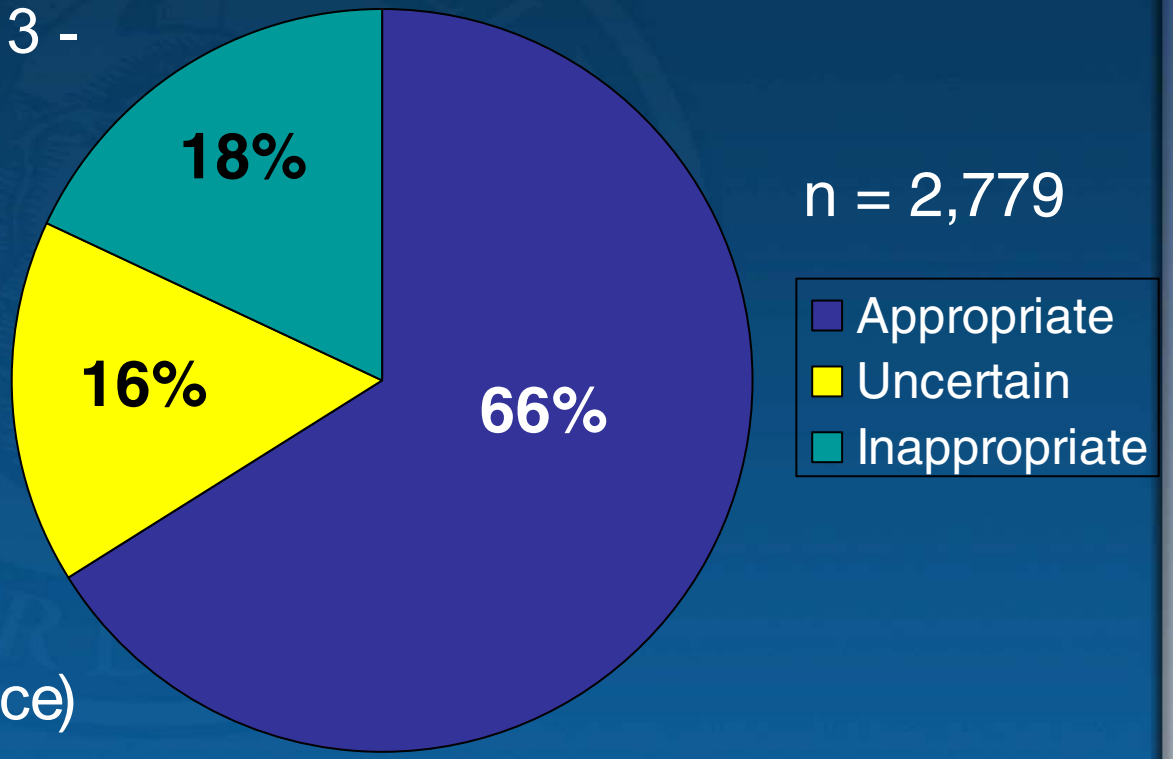
Resting ECG Interpretable[5000]: O No O Yes
Test Result[5010]: O Normal O Abnormal
→ If Abnormal, Extent of Ischemia[5020]: O None O Small O Moderate O Large
→ If Abnormal, Extent of Scar/Infarction[5030]: O None O Small O Moderate O Large
LVEF[5040]: %
Stress Test Type[5050]: O Exercise O Pharmacological O Pharmacologic w/Exercise
→ If Pharmacological or Pharm/Exercise, Drug Administered[5060]: O Adenosine O Atropine O Dipyridamole O Dobutamine
→ If Exercise or Pharm/Exercise, Functional Capacity[5070]: O Reduced O Average O Superior
→ If Exercise or Pharm/Exercise, Duration (If Bruce Protocol)[5080]: mins
Ischemic ST Changes During Test[5090]: O No O Yes
Angina During Test[5100]: O Typical O Atypical O Non-Anginal/None

Preliminary Findings

- Vast majority of patients able to be classified as to level of appropriateness
- Findings consistent with other studies
  - Wide practice variation
  - Few indications account for majority of inappropriate studies
  - Greater frequency of inappropriate tests from outside of lab
- Collection of test results
  - Validate criteria
  - Potential to be used to track downstream utilization – value of test (separate project - planning cohort study for CCTA)

Preliminary Data

- Data collection from March 3 - July 31, 2008
- 6/7 sites entering data
- 3,035 studies
- 256 excluded
  - 173 for insufficient data (64% from single practice)
  - 82 for conflicting scores



Pilot Site Specific Results

Site	N	Appropriate	Uncertain	Inappropriate	Not classified
#1	157	55%	15%	22%	5%
#2	811	54%	8%	22%	14%
#3	728	60%	17%	17%	2%
#4	861	60%	21%	13%	3%
#5	291	79%	6%	11%	2%
#6	187	59%	19%	18%	2%

Most Common "Inappropriate" Indications

INDICATION	FREQUENCY	PERCENT
Detection of CAD Asymptomatic, low CHD risk	262	9%
Asymptomatic, post-revascularization < 2 years after PCI, symptoms before PCI	91	3%
Evaluation of chest pain, low probability pt Interpretable ECG and able to exercise	82	3%
Pre-operative assessment Low risk surgery	21	1%
Asymptomatic or stable symptoms < 1 year after cath or abnormal prior SPECT	16	<1%

Quality Improvement and Educational Initiatives

- *De-identified* feedback to *individual* practitioners regarding their practice patterns in reference to benchmarks
- Development and dissemination of list of top inappropriate indications
- Internal education within cardiology practice regarding key inappropriate indications and ordering patterns
- Support of joint attribution by a “non-threatening” letter to referring practitioners about inappropriate use and key targets
- Decision support tools, via PDA, Internet, order-entry

Not only Overuse, Potential Underuse

- Ischemia only documented 44% of time by stress testing prior to PCI (Lin, JAMA, 2008)
- COURAGE results would indicate that documentation of ischemia important prior to decision to proceed to elective PCI
- *Appropriate use criteria for revascularization (in press) emphasize need for objective evidence of ischemia before performing revascularization*

Conclusions

- Appropriate use evaluation tool
  - Rapid, easy to use, and provides feedback
- Transparent methods accepted by physicians and payer
- Potentially superior method to RBMs' indiscriminant volume reduction and "expensive" approach
- Potential to understand the value of imaging test results and their impact on downstream utilization
- Important collaboration between physicians/ medical societies and health plans for ongoing quality improvement for cardiovascular imaging

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