Appropriate Use Criteria (AUC) for Pediatric Outpatient Echocardiography: What the Pediatrician should know

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Outline
- Background and historical perspective – why AUC?
- Utilization of pediatric echo
- Discuss the pediatric AUC document
- Impact of AUC and future directions
Why AUC?

- Technological advances in non-invasive cardiac imaging - echo, CT, MRI, nuclear imaging
- Progressive increase in utilization and costs - doubling of costs between 2000-2005
- Wide variability among providers

Why AUC?

- Volume vs Value

Value  =  Cost

Quality = outcomes & patient experience

Temporal Trends in Echocardiography 1999 to 2004

Non-cardiac imaging: 5.9%
Advanced cardiac imaging: 14.2%
Echo: 10.6%
Curb Rising Cost

- Deficit act reduction of 2005 Reduced fee for imaging at physician offices
- Pre-authorization requirements by payors
- Need for standard criteria – ACC Appropriate Use Task force

Year | Existing Adult Cardiology AUC
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2005, 2009 | Nuclear imaging
2006 | CT and MRI
2007, 2011 | Echo: TTE, TEE, Stress echo
2009 | Coronary revascularization
2013 | Peripheral vascular ultrasound
2014 | Multimodality imaging in stable ischemic heart disease
2016 | Percutaneous intervention in ischemic heart disease

Appropriateness Rating

- **Appropriate:** Test is generally acceptable and is reasonable approach for the indication
- **May Be Appropriate:** Test may be generally acceptable and may be a reasonable approach for the indication
- **Rarely Appropriate:** Test is not generally acceptable and is not a reasonable approach for the indication
Echo utilization in Pediatrics

- No nationwide data

Temporal trends in Utilization of Transthoracic Echocardiography for Common Outpatient Pediatric Cardiology Diagnoses over the Past 15 Years

- Single center study – 2000-2014
- Of the 74,881 patients seen by 35 physicians, 36,053 (48.1%) had a TTE
- TTE rates increased from the beginning of 2000 to the end of 2004 (5.2% per year; P < .001) and then declined until the end of 2014 (1.6% per year; P < .001)

Temporal trends in Pediatric Echo

- High utilization for non-cardiac chest pain (50-62%) and in infants (80%<1 mo, 59% <1yr)
- Variables associated with higher TTE utilization: younger age, males, Medicaid insurance, increased distance from clinic, less experienced physicians
- Temporal trends persisted after adjusting for all above factors
Echo utilization for chest pain in 2013

- Highly variable

Echo Utilization: Innocent Murmur

- 43% echo utilization (23,114 patients over 3 yrs)
- Wide variation among providers (14%-86%)
- Age < 1 highest utilization (62% vs 33%)

Ordering practices

- Appropriateness of Outpatient Echocardiograms Ordered by Pediatric Cardiologists or Other Clinicians

- Though healthcare spending in pediatric cardiac imaging <<< adult imaging, there is room for standardization!!
Ordering Practices
- Single Center – prior to AUC release
- 1921 TTEs - 84.6% cardiologists, 9.2% pediatricians, 3.4% FPs, 2.8% noncardiology subspecialists.
- A rate for cardiologists was higher than that for PCPs (86% vs 64%; P < .001) but not noncardiology subspecialist (86% vs 87%; P = .80)
- PCPs had higher proportion of studies that could not be classified compared with cardiologists (35% vs 5%; P < .001) information.
- The likelihood of an abnormal finding was higher for cardiologist (OR, 4.8; 95% CI, 2.1-10.9; P < .001)

First Pediatric AUC
ACC AUC Task Force

AUC Document - Process
- Writing group reviews indications, definitions, literature review, guideline mapping
- Review panel provides feedback
- Rating panel rates indications (Rand-Delphi method)
- Reviewed by academic societies
- Approved by ACC board of trustees
What Pediatric –AUC does….

- Only addresses initial outpatient pediatric visit
- Transthoracic echo
- Rates 113 indications for ordering an echo- ex. Palpitations, syncope, chest pain, murmur, systemic disorders etc
- Flow diagrams for common conditions- chest pain, syncope, palpitations, murmur
- Educational and QI tool to track and reduce inappropriate testing for low yield conditions

What Pediatric –AUC does not….

- Not fully include of every possible scenario
- Appropriate ≠ recommend echo
- Rarely appropriate ≠ should not get echo
- Not replace clinician’s judgement /assessment
- May Be Appropriate or Rarely Appropriate should not mean payer denial of claims

Has AUC made a difference?

- Annual Medicare Payment Advisory (MedPAC) reports
- Medical imaging from 2009 to 2013 -7%
- Echo : 17 %
- Multifactorial- pre-authorization requirements, reduced reimbursement, physician education, implementation of AUC
Has AUC made a difference?

- JAMA Cardiol. 2016 Oct 1;1(7):805-812 Dudzinski et al – RCT for educational intervention to improve utilization of echo. Decreased rarely appropriate TTE ordering in the education group (10.5% vs 16.5%, p=0.01)
- Echocardiography 2014;31:916-923 Bhatia et al – post-educational and feedback intervention proportion of rarely appropriate TTE increased to pre-intervention level

Has AUC made a difference?

- Echo WISELY (Will Inappropriate Scenarios for Echocardiography Lessen Significantly) study - Multicenter RCT study will examine the efficacy of education and feedback intervention in reducing the rate of outpatient inappropriate TTEs ordered by attending level cardiologists and primary care physicians Bhatia et al. (Am Heart J 2015;170:202-9.)

Ped- AUC Implementation

Pediatric Appropriate Use Criteria Implementation Project
A Multicenter Outpatient Echocardiography Quality Initiative

(J Am Coll Cardiol 2015;66:1132–40)
PAUSE study

- Multicenter study – 6 sites
- Baseline data, effect of release of AUC document, effect of educational intervention
- 71% A, 12% M, 12% RA, unclassifiable 5%

PAUSE study

- 85% Normal, 10% abnormal, 5% incidental findings
- Abnormal findings were only in A or M
- Most common RA indications - murmur, syncope, palpitations
- Variability among sites
- No change with AUC release, but significant reduction post educational intervention

Future Directions

- Integration with EMR
- Point of care decision support tools
- Methods for audit and feedback
- Accreditation requirements for Echo Labs
- MOC points for physicians
Future Directions

- Missed opportunities?
- J Am Soc Echocardiogr. 2012 Jun;25(6):589-98. Ballo et al. Hospitalized patients – patients discharged without echo may have been appropriate to image in 16%
- Continual evaluation and revise criteria/implementation methods

Summary

- Current health care climate is value based
- Difficult to estimate outcome based “value” of an imaging test (hidden/indirect impact)
- AUC is a clinician-led approach to guide resource utilization in cardiology
- Feasible in a variety of practice settings
- Need to optimize application of AUC and long term compliance

Questions?
Thank you!