





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


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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


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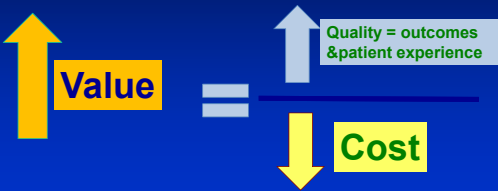
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Why AUC?

- Volume vs Value

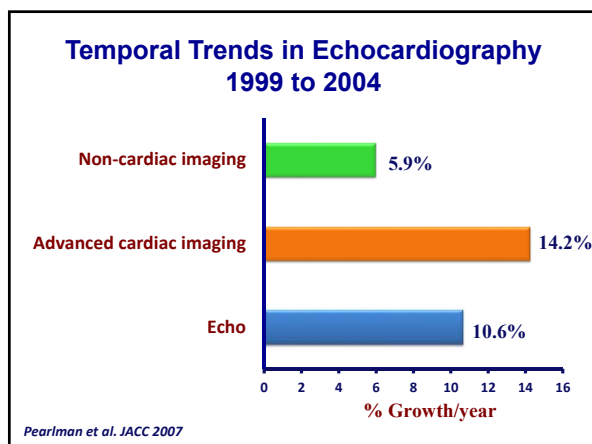



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Curb Rising Cost

- **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
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



Ritu Sachdeva, MBBS, Curtis D. Travers, MPH, Courtney E. McCracken, PhD, Cyrus Samai, MD, Robert M. Campbell, MD, Timothy C. Slesnick, MD, and William L. Border, MD, MPH, Atlanta, Georgia

J Am Soc Echocardiogr 2017;30:201-8

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Temporal trends in Pediatric Echo

- 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; $P < .001$)

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Temporal trends in Pediatric Echo

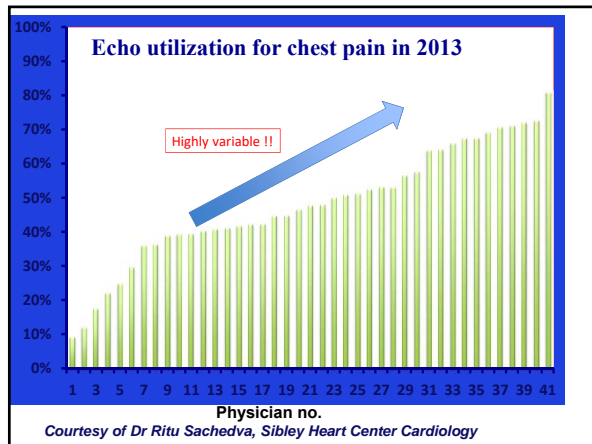
- High utilization for non-cardiac chest pain (50-62%) and in infants (80% < 1 mo, 59% < 1 yr)
- Variables associated with higher TTE utilization: younger age, males, Medicaid insurance, increased distance from clinic, less experienced physicians
- Temporal trends persisted after adjusting for all above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

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Echo Utilization: Innocent Murmur

Outpatient echocardiography in the evaluation of innocent murmurs in children: utilisation benchmarking

Patricio A. Frias,¹ Matthew Oster,¹ Patricia A. Daley,² Jeffrey R. Boris² *Cardiology in the Young* (2016), 26, 499–505

¹Children's Healthcare of Atlanta Sibley Heart Center, Department of Pediatrics, Emory University School of Medicine, Atlanta, Georgia; ²Children's Hospital of Philadelphia, University of Pennsylvania School of Medicine, Philadelphia, Pennsylvania, United States of America

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

Though health care spending in Pediatric cardiac imaging <<< adult imaging, there is room for standardization !!

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Ordering practices

Appropriateness of Outpatient Echocardiograms Ordered by Pediatric Cardiologists or Other Clinicians

Kirsten Rose-Felker, MD^{1,2}, Michael S. Kelleman, MSPH¹, Robert M. Campbell, MD^{1,2}, and Ritu Sachdeva, MBBS^{1,2}

(J Pediatr 2017; Epub ahead of print)

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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

APPROPRIATE USE CRITERIA

ACC/AAP/AHA/ASE/HRS/
SCAI/SCCT/SCMR/SOPE
2014 Appropriate Use Criteria for
Initial Transthoracic Echocardiography
in Outpatient Pediatric Cardiology

A Report of the American College of Cardiology Appropriate Use Criteria Task Force,
American Academy of Pediatrics, American Heart Association, American Society of
Echocardiography, Heart Rhythm Society, Society for Cardiovascular Angiography and
Interventions, Society of Cardiovascular Computed Tomography, Society for Cardiovascular
Magnetic Resonance, and Society of Pediatric Echocardiography

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JACC Nov 2014; 64: 2039
JASE Dec 2014; 27:1347

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%, $p=0.01$)
- *JACC Cardiovasc Imaging* 2013;6:5:545-55 Bhatia et al – similar effect in inpatient setting
- *Echocardiography* 2014;31:916-923 Bhatia et al- post- educational and feedback intervention proportion of rarely appropriate TTE increased to pre-intervention level



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Has AUC made a difference?

- *J Am Soc Echocardiogr* 2009;22:1375-81. Ward et al. Similar rates of appropriateness - Academic vs community practice
- 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.)*



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Ped- AUC Implementation

Pediatric Appropriate Use Criteria Implementation Project

A Multicenter Outpatient Echocardiography Quality Initiative

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(J Am Coll Cardiol 2015;66:1132–40)



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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 !
