The Views for Point-of-care Echocardiography

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Echo Florida: Contemporary Echocardiography
American Society of Echocardiography
Sat. Oct 12, 2013. 850-910 am
Point-of-care echo

- AKA bedside ultrasound, emergency ultrasound, focused ultrasound
- Diagnostic test performed by clinician in addition to history, PE, EKG, x-rays, CT, comprehensive echo, etc
- Provides immediate actionable information in critical settings
So you want to do your own echocardiography?

- Formal training, with *specialty-specific guidelines*
  - Knowledge
    - Image acquisition
    - Image interpretation
    - Incorporation into clinical practice
  - Practice
    - Hospital privileging
    - Documentation/reporting
    - Archiving
    - Quality assurance process with feedback
Plummer

1992 - First point of care ultrasound fellowship
       Christ Hospital
       Chicago

1998

2001

2008

2010

2013
First ACEP Ultrasound Guidelines

Plummer

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Revised ACEP Ultrasound Guidelines

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First point of care ultrasound fellowship
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Chicago

ASE/ACEP Joint Statement
2010

First ACEP Ultrasound Guidelines
1998

Revised ACEP Ultrasound Guidelines
2008

Ultrasound made a “core competency” for ACGME EM residency accreditation
2013

Plummer

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What are we looking for?

- Cardiac
  - LV function
  - Pericardial effusion/tamponade
  - RV strain
  - Activity

- Other
  - Pneumothorax
  - Pulmonary edema
  - Peritoneal fluid
  - Pleural fluid
  - AAA
  - Aortic dissection
  - DVT
  - IVC
Keep it simple

- The three Es
  - Ejection fraction?
  - Effusion?
  - Equality?
Indications

Basic (EEE)
- Chest pain
- Shortness of breath
- Unexplained hypotension
- Pericardial tamponade or effusion
- Cardiac arrest (asystole, PEA…)
- Blunt or penetrating chest trauma
- Cardiomegaly
- Low-voltage EKG

Advanced
- Focal wall motion abnormalities
- Pericardiocentesis
- Transvenous pacemaker placement and capture
- Valvular disease
- Aortic dissection
- Cardiac masses
- Vegetations
- TEE
**Indications**

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**Advanced**
- Focal wall motion abnormalities
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Technique

- Cardiac, phased-array probe
- Small footprint
- Supine or left-lateral decubitus position
  - Elevating left arm over head may help
- 4 primary views
  - Subxiphoid
  - Paraternal Long Axis
  - Parasternal Short Axis
  - Apical 4-chamber
Subxiphoid
Subxiphoid
Subxiphoid
Subxiphoid
Subxiphoid
Parasternal Long Axis
Parasternal Long Axis
Parasternal Long Axis

RV

LV

MV

Ao

LA

AV

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Parasternal Short Axis
Parasternal Short Axis
Parasternal Short Axis

RV

LV

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Apical 4-chamber
Apical 4-chamber

RV     LV

TV     MV

RA     LA
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<th>SubX</th>
<th>PSL</th>
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<tbody>
<tr>
<td><strong>Ejection fraction</strong></td>
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<tr>
<td><strong>Effusion</strong></td>
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<td><strong>RV strain</strong></td>
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Case #1

- 28 yo male BIBEMS for assault in local gentleman’s club after altercation. Stabs to chest, back
- Decreased mental status, moaning, withdraws to pain, attempts to answer questions
- Focused cardiac ultrasound done at time 0 minutes...
Case #1

- Trauma team present
- To OR at time 5 minutes
- Right atrial injury, repaired. Full recovery.
Case #1

- Retrospective review of the effect of immediate 2-D echocardiography on the time to diagnosis and survival rate of patients with penetrating cardiac injury.
- 49 patients with penetrating cardiac injury were reviewed.
  - 28 received immediate echo, 21 did not
- Time to diagnosis and disposition for surgical intervention:
  - 15.5 min vs. 42.4 min
- Survival:
  - 100% vs 57.1%

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Echo saves lives!

Case #2

- 36 yo female with no PMH presents with chest pain x 1 hour
- HR 75, BP 70/40, RR 26, 91% RA
Case #3

- 82 yo female, past history of AMI, diabetes type II. Present to the ED dyspneic, with altered mental status and hypotension.
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Case #3

- 82 yo female, past history of AMI, diabetes type II. Present to the ED dyspneic, with altered mental status and hypotension.
Case #4

• 88 yo male BIBEMS after being found unresponsive. PEA arrest, CPR initiated x 15 minutes
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Questions?

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Thank you!

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