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POINT OF CARE ULTRASOUND: FOR ALL CLINICIANS

Why ultrasound?

- Portable
- Safe
- Repeatable
- Digital
- Decision support
- Battery operated
- Cost-effective
- Multi-use

Table 1. Selected Applications of Point-of-Care Ultrasonography, According to Medical Specialty.*

Specialty	Ultrasound Applications
Anesthesia	Guidance for vascular access, regional anesthesia, intraoperative monitoring of fluid status and cardiac function
Cardiology	Echocardiography, intracardiac assessment
Critical care medicine	Procedural guidance, pulmonary assessment, focused echocardiography
Dermatology	Assessment of skin lesions and tumors
Emergency medicine	FAST, focused emergency assessment, procedural guidance
Endocrinology and endocrine surgery	Assessment of thyroid and parathyroid, procedural guidance
General surgery	Ultrasonography of the breast, procedural guidance, intraoperative assessment
Gynecology	Assessment of cervix, uterus, and adnexa; procedural guidance
Obstetrics and maternal–fetal medicine	Assessment of pregnancy, detection of fetal abnormalities, procedural guidance
Neonatology	Cranial and pulmonary assessments
Nephrology	Vascular access for dialysis
Neurology	Transcranial Doppler, peripheral-nerve evaluation
Ophthalmology	Corneal and retinal assessment
Orthopedic surgery	Musculoskeletal applications
Otolaryngology	Assessment of thyroid, parathyroid, and neck masses; procedural guidance
Pediatrics	Assessment of bladder, procedural guidance
Pulmonary medicine	Transthoracic pulmonary assessment, endobronchial assessment, procedural guidance
Radiology and interventional radiology	Ultrasonography taken to the patient with interpretation at the bedside, procedural guidance
Rheumatology	Monitoring of synovitis, procedural guidance
Trauma surgery	FAST, procedural guidance
Urology	Renal, bladder, and prostate assessment; procedural guidance
Vascular surgery	Carotid, arterial, and venous assessment; procedural assessment

* FAST denotes focused assessment with sonography for trauma.

Why wait for specialization?

Why not in medical school??

With one machine

Hypotension, fluid status

Liver and spleen

Thoracentesis

Pneumothorax

B-lines – pulmonary fluid

FAST

Pregnancy

Foreign body ID

AAA

Abscess drainage

Central Line placement

Ecohcardiography

DVT

Peripheral IV placement

Paracentesis

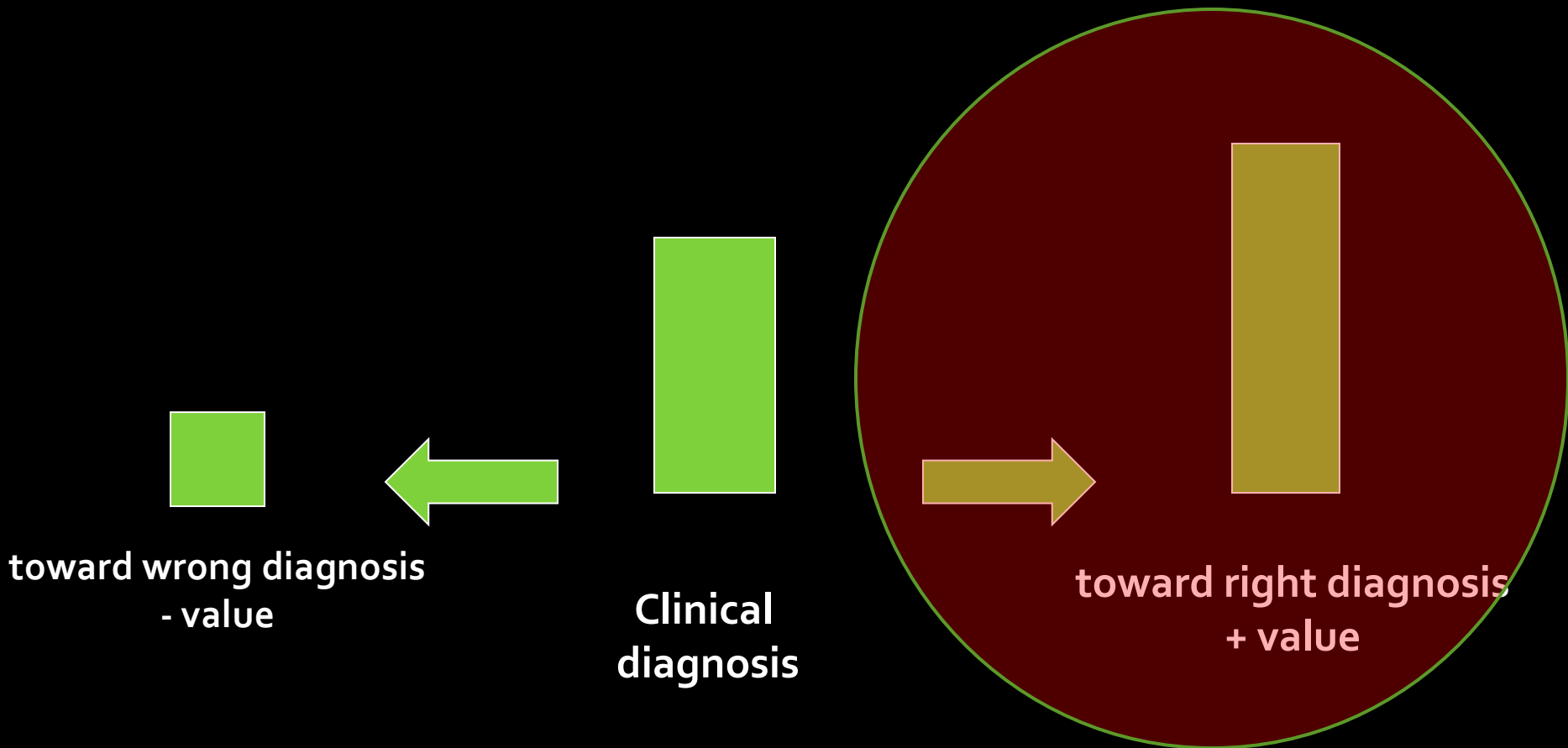
Gallstones

IVC- volume assessment

Usefulness score

Lapostolle F et al Am J Emerg Med 2(3):1076

- Push clinician toward the right diagnosis
- Push clinician toward the wrong diagnosis



Objectives

- Clinical scenarios – making the case
- Literature support – but is it safe?
- Seeing the larger picture -
  - universal training and quality assurance issues

80 yo with dyspnea

- HR 110 O2 sat 88% 99F
- Pursed lips
- Scattered wheezes
- Decreased air movement
- Distended tender abdomina
- Asymmetric leg swelling

What does the clinician need to know?

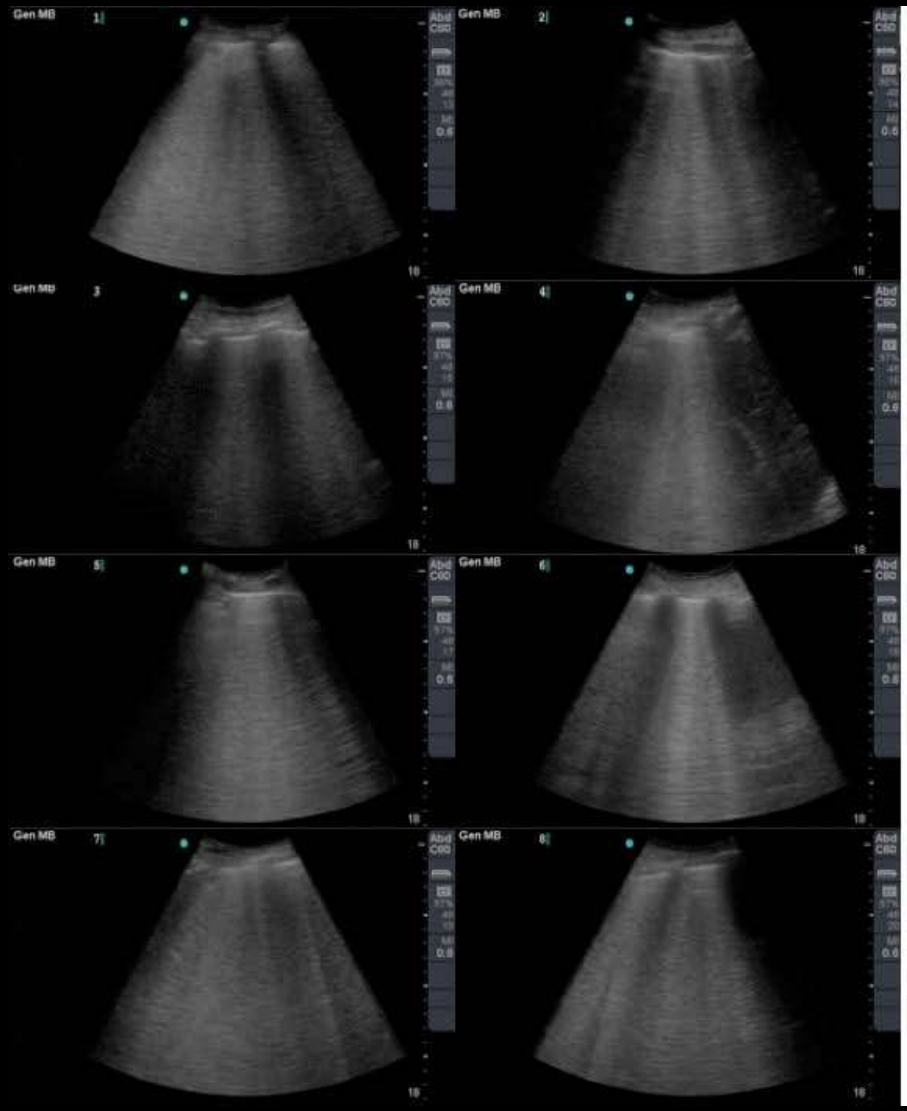
- Differential:
  - CHF
  - COPD exacerbation
  - PTX
  - PE
  - Hemorrhage/hypovolemia
  - Pleural effusions
  - Pneumonia
  - Anxiety
- BNP
- Ddimer
- CXR
- CT
- LENI
- EKG
- Albuterol
- Lasix
- Steroids
- Heparin

What are the pressures on the clinician?

- Time
- Disposition
- Cost
- Outcomes
- Accuracy
- Patient satisfaction
- Quality Measures

What does the clinician need to know?

- CHF vs COPD – A-lines vs B-lines


Gen MB 1
Gen MB 2
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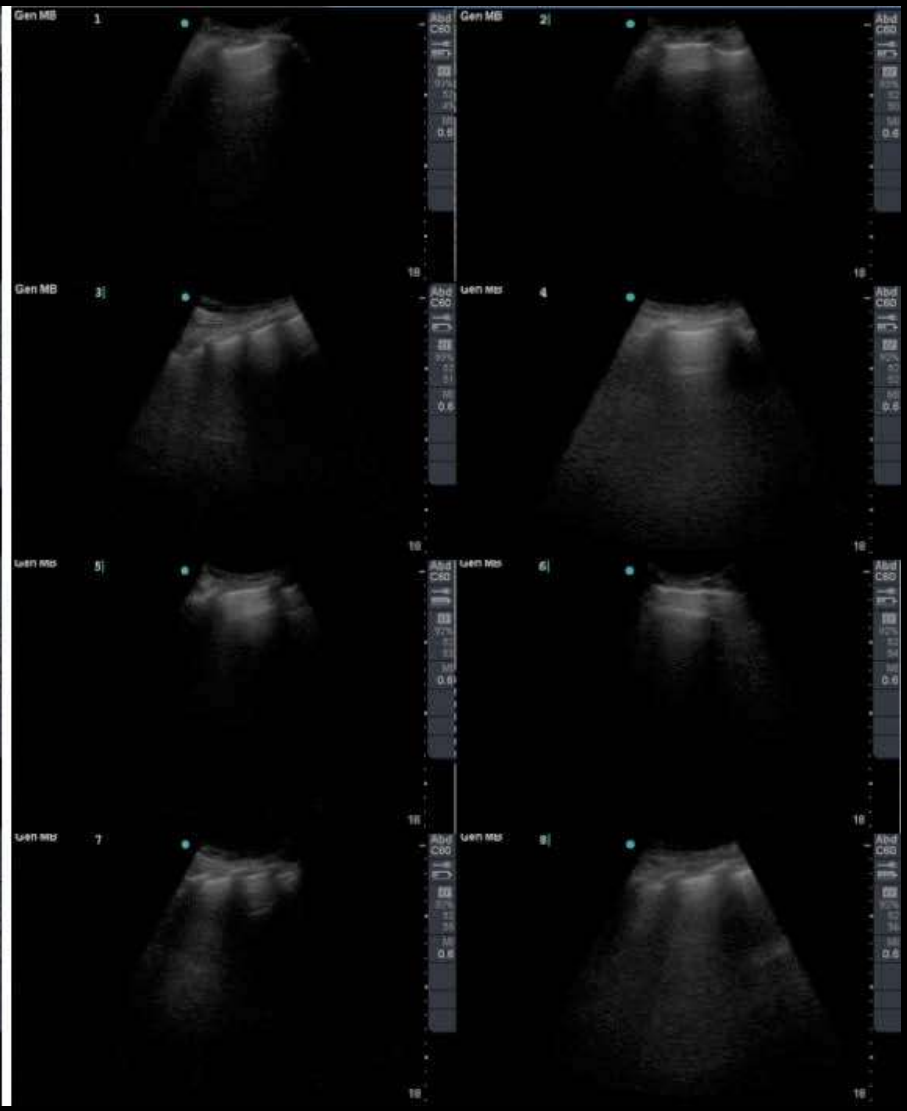
Gen MB 5
Gen MB 6
Gen MB 7
Gen MB 8


Gen MB 1
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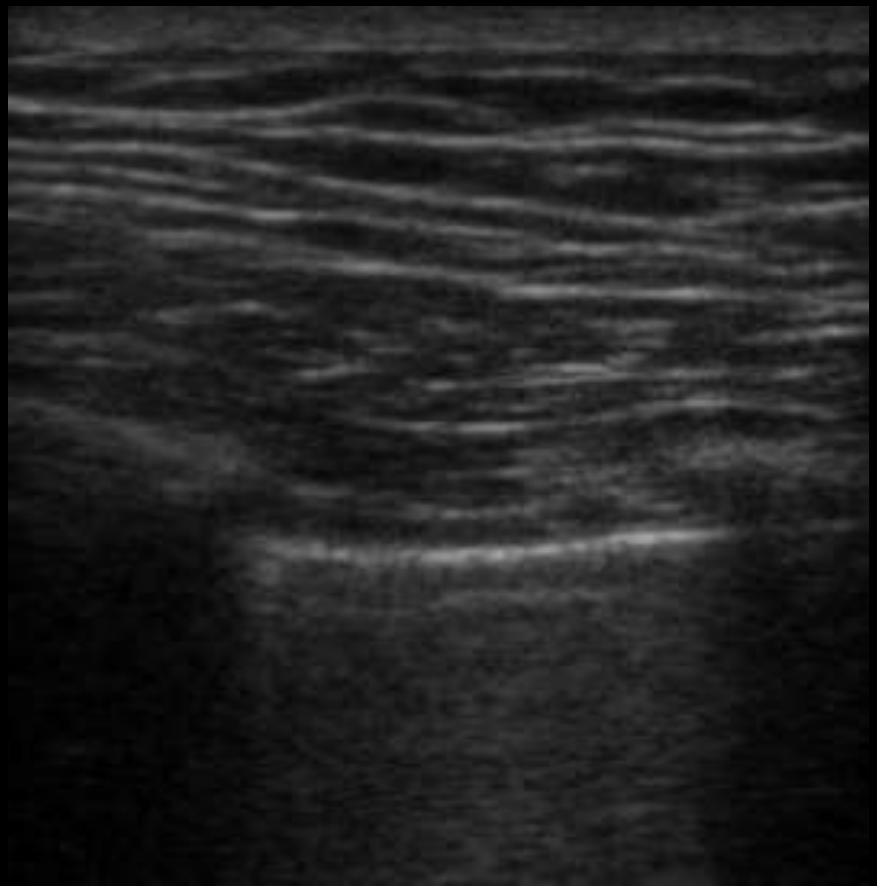
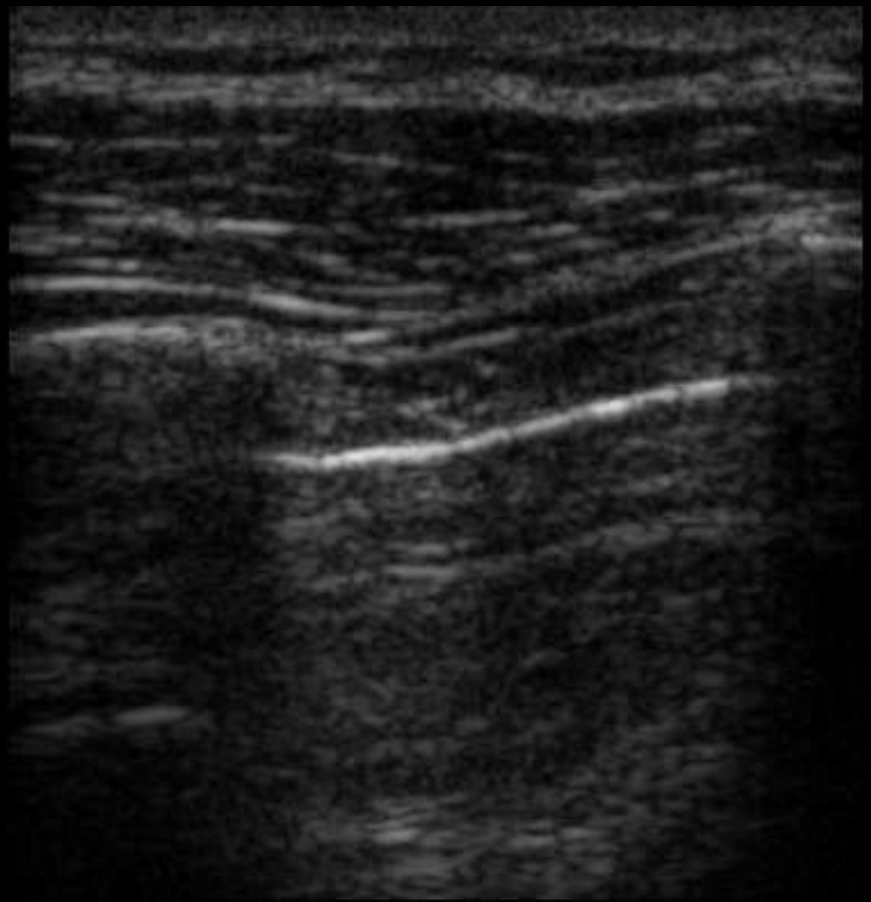
What does the clinician need to know?

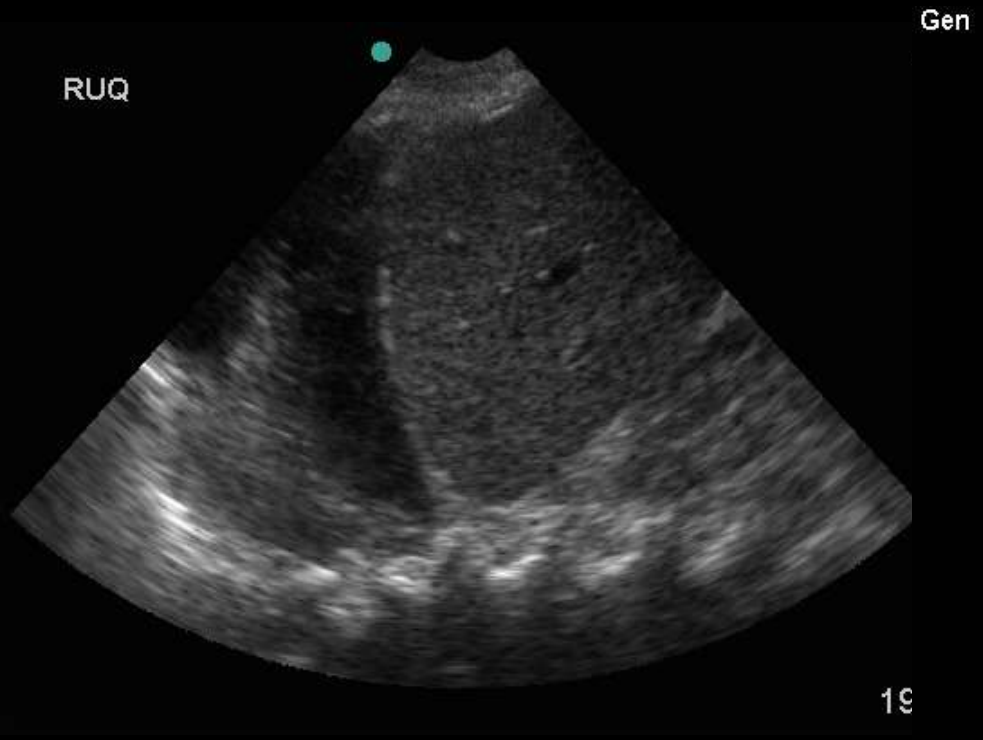
- PTX – lung sliding yes or no

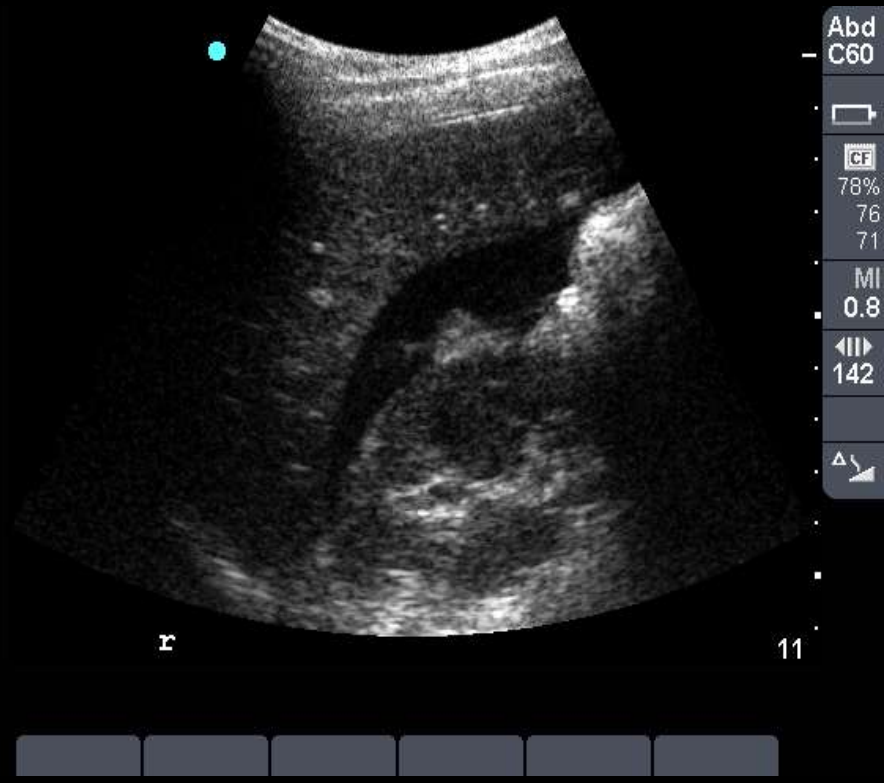


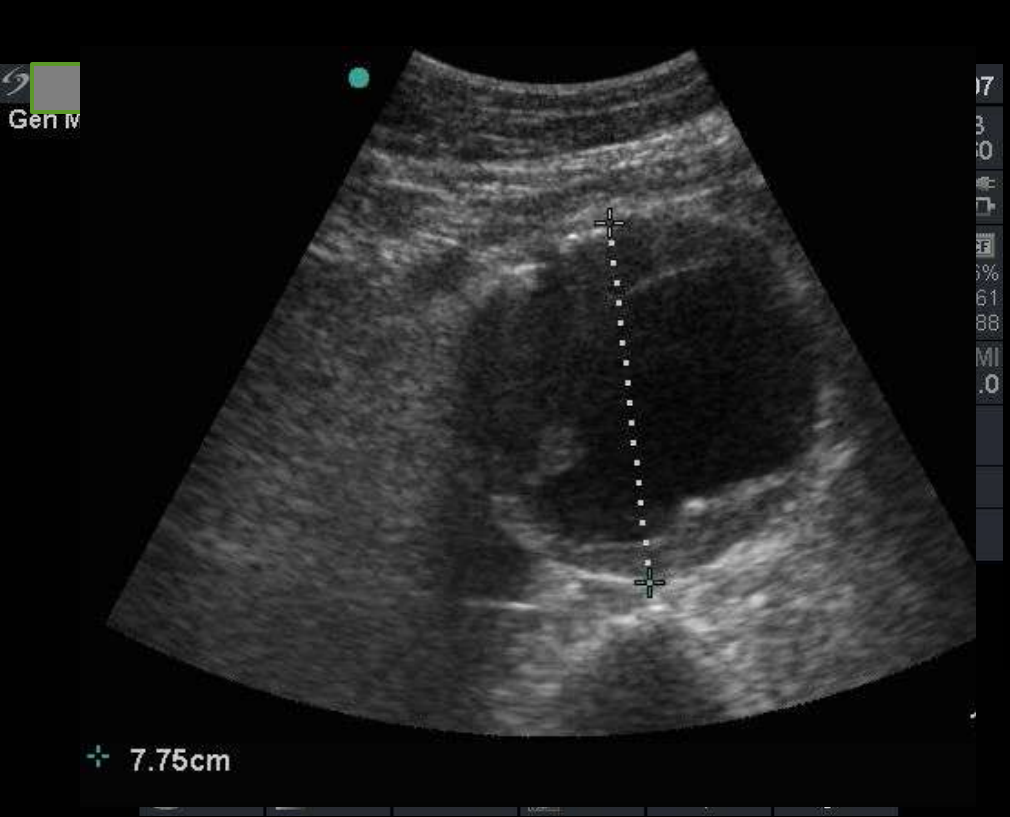


What does the clinician need to know?

- Hemorrhage ?



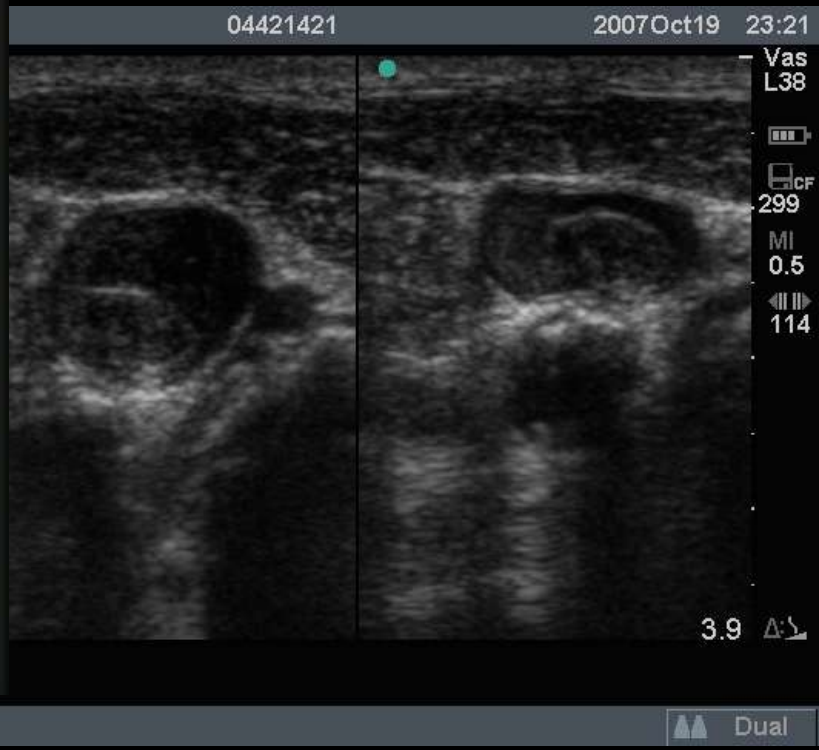


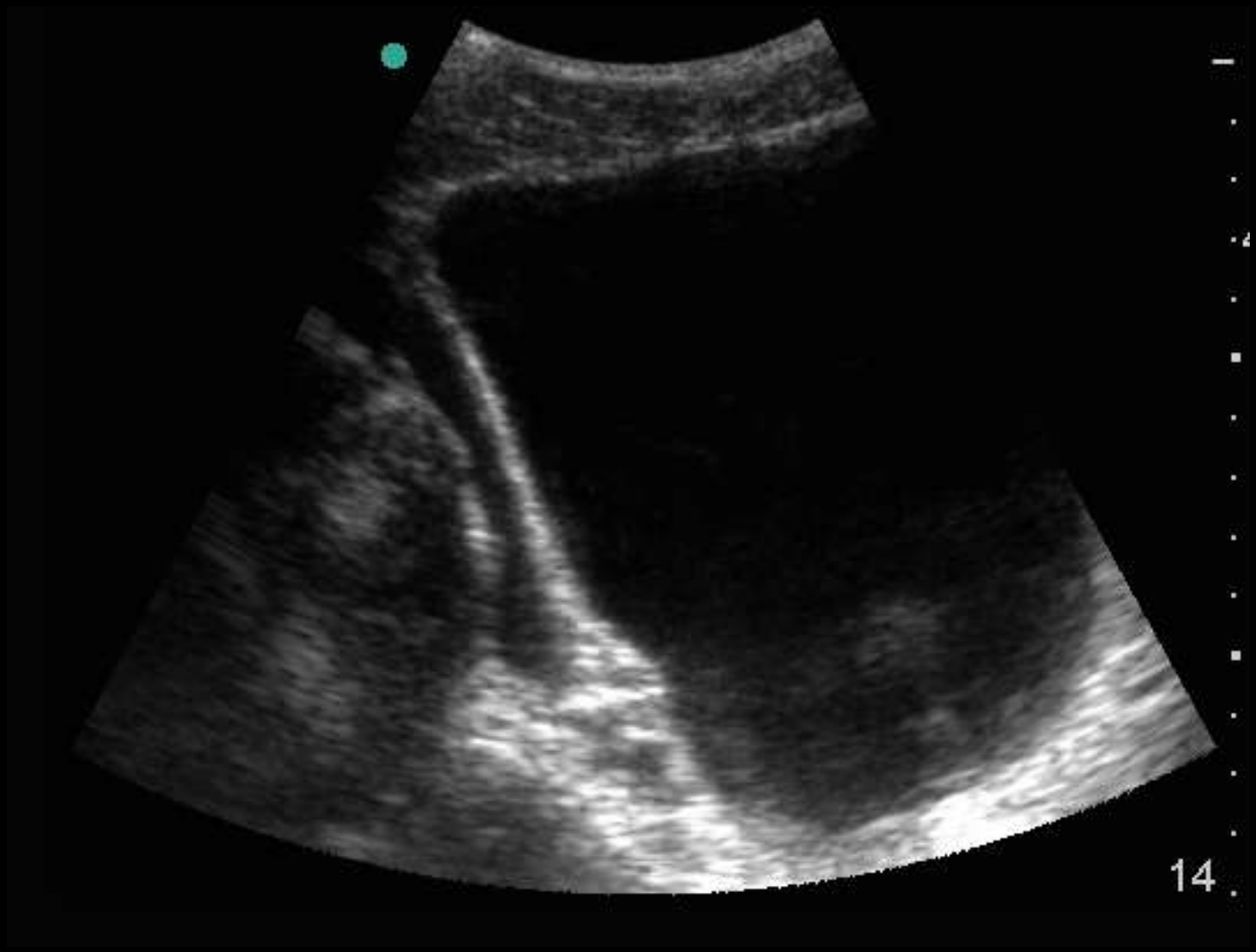

7.75cm


Abd
C60
CF
78%
76
71
MI
0.8
142

How can point of care ultrasound help?

- PE – R heart size, DVT

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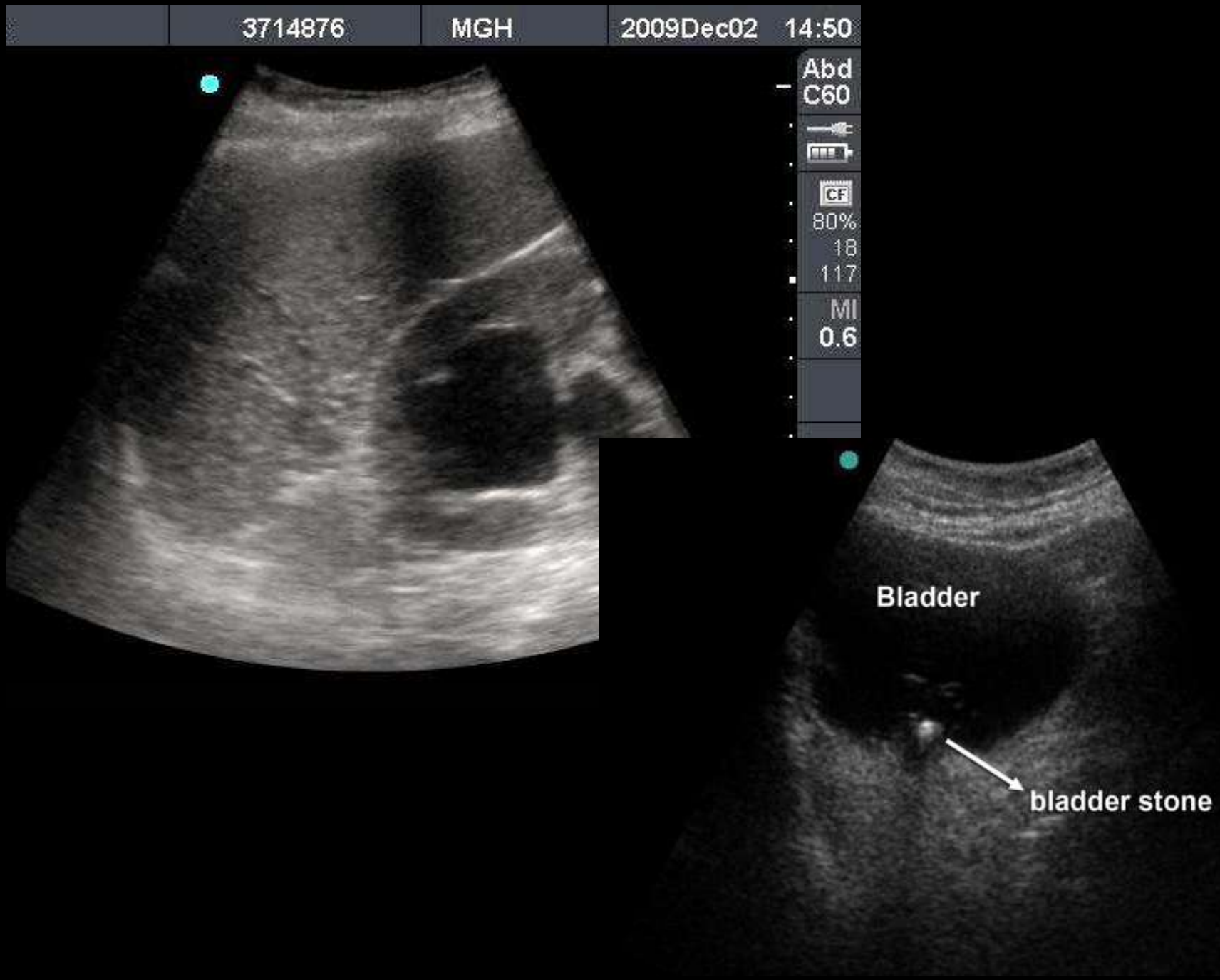
3714876
MGH
2009Dec02 14:50
Abd
C60
CF
80%
18
117
MI
0.6
Bladder
bladder stone

How can point of care ultrasound help?

- Bring the physician back to the bedside
- Education
- Visual teaching tool

Doctor and the Doll by Norman Rockwell

How can point of care ultrasound help?

- EXPEDITE CARE - **Know the studies**
  - First trimester – decreased LOS Burgher et al 1998
  - Biliary colic – decreased return visits Durston et al 2001
  - DVT – decreased LOS, Blaivas et al 2000
  - Trauma – decreased LOS, decreased CT Melniker et al 2003
  - Cardiac trauma/AAA – time to OR, Plummer et al 1992

BUT IS IT SAFE???

Accuracy

- FOCUSED QUESTIONS
  - **Know the studies**
    - First trimester – Stein et al 2010 Acad Emerg Med
    - AAA – Tayal et al 2003 Acad Emerg Med
    - Gallstones - Durston et al 2001 Am J Emerg Med
    - DVT - Blaivas et al 2000 Acad Emerg Med
    - Cardiac function – Moore et al 2002 Acad Emerg Med
    - Pericardial effusions – Alexander et al 2004 Am Heart J

Not to minimize competency…

- Develop training program
- Documentation
- Reporting – visible and transparent
- Quality assurance program
- Use on line resources

- In the beginning you have to be perfect

MANDATORY FIRST STEP

CHAMPION OF THE CAUSE

Know the resources

- www.sonoguide.com
- http://hqmeded.com
- http://pointofcare.blogspot.com/
- http://www.sonoworld.com
- http://www.ultrasoundvillage.com
- http://www.echobasics.de/tte-en.html
- http://msksono.com/index.html
- Emedicine procedures

Thank you

QUESTIONS?