

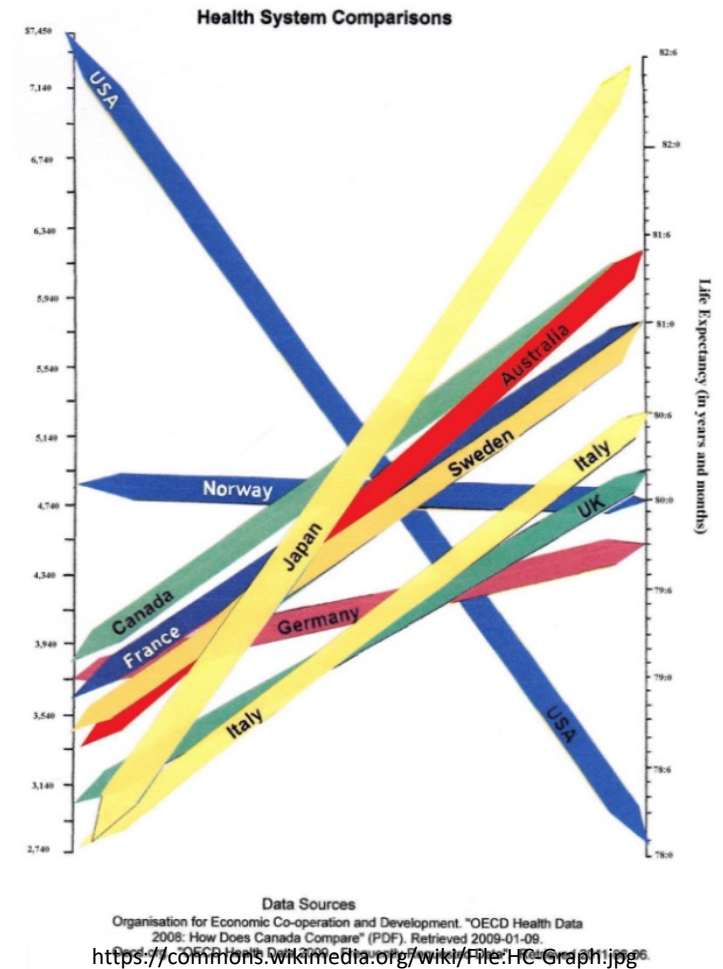
Implementing a POCUS Curriculum in Your Family Medicine Residency

Paul Bornemann, MD

Why should family medicine residency programs want to incorporate POCUS training?

Why Ultrasound?

- Healthcare in the US is expensive and with suboptimal outcomes.
- High utilization of expensive diagnostic testing along with disparities in access.



Why Ultrasound?

US can decrease use of costly diagnostic studies and improve outcomes.

- Nephrolithiasis, Musculoskeletal...
- Central lines, thoracentesis, arthrocentesis...



www.ultrasoundfirst.org

Why Ultrasound?

POCUS applications can be performed effectively by non-specialist physicians

- AAA screening, DVT, Cardiac...
- Evidence of Feasibility in Family Medicine setting



Blois B. Can Fam Physician. 2012.
Crisp JG, Ann Emerg Med. 2010.
Mjølstad OC, Fam Pract. 2012.

Bornemann P, et al. JABFM. 2015.
Bornemann, P. et al. *Military Medicine*. 2015.

Undergraduate Medical Education

Over 90 US
medical schools
have POCUS
curricula!!!

RESEARCH

Open Access



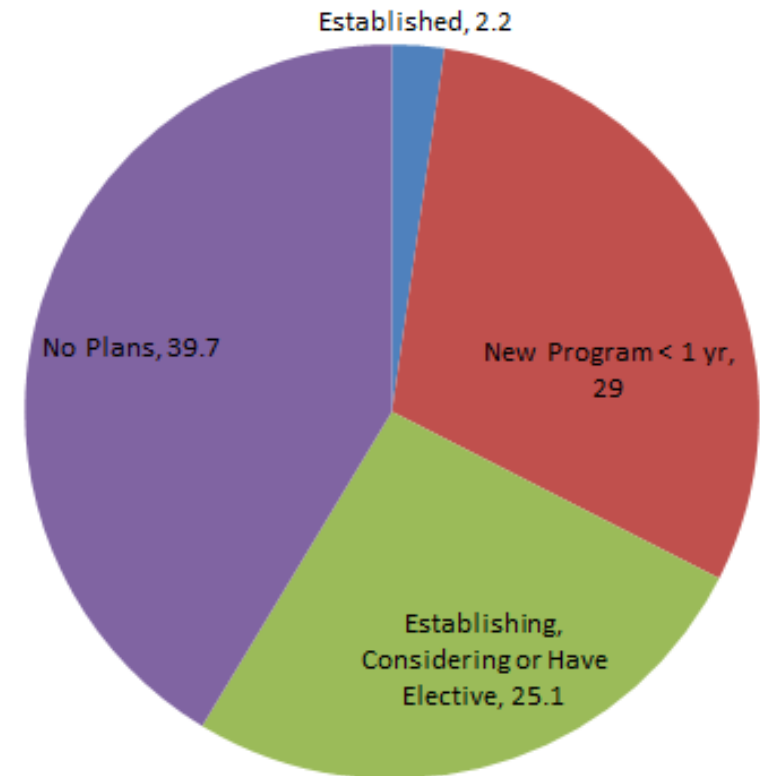
The evolution of an integrated ultrasound curriculum (iUSC) for medical students: 9-year experience

Richard A. Hoppmann*, Victor V. Rao, Floyd Bell, Mary Beth Poston, Duncan B. Howe, Shaun Riffle, Stephen Harris, Ruth Riley, Carol McMahon, L. Britt Wilson, Erika Blanck, Nancy A. Richeson, Lynn K. Thomas, Celia Hartman, Francis H. Neuffer, Brian D. Keisler, Kerry M. Sims, Matthew D. Garber, C. Osborne Shuler, Michael Blaivas, Shawn A. Chillag, Michael Wagner, Keith Barron, Danielle Davis, James R. Wells, Donald J. Kenney, Jeffrey W. Hall, Paul H. Bornemann, David Schrift, Patrick S. Hunt, William B. Owens, R. Stephen Smith, Allison G. Jackson, Kelsey Hagon, Steven P. Wilson, Stanley D. Fowler, James F. Catroppo, Ali A. Rizvi, Caroline K. Powell, Thomas Cook, Eric Brown, Fernando A. Navarro, Joshua Thornhill, Judith Burgis, William R. Jennings, James B. McCallum, James M. Nottingham, James Kreiner, Robert Haddad, James R. Augustine, Norman W. Pedigo and Paul V. Catalana

FM GME Needs Assessment

- **Currently only 6% of practicing family physicians report using non-obstetrical POCUS**
- **Few Family Medicine residencies have POCUS training, although there is a large degree of interest.**

FM Residencies w/ POCUS (%)





Growing Momentum

- Growing evidence on improved outcomes
- Medical school POCUS curricula
- Devices are rapidly becoming smaller and less expensive



Growing Momentum

- **2016 Congress of Delegates Passed Resolution # 602**
 - Encourage every FM residency program to include POCUS training
 - Offer POCUS CME Programs
 - Increase continuing professional development opportunities and faculty development programs regarding POCUS at its annual meeting and continuing medical education courses



AMERICAN ACADEMY OF
FAMILY PHYSICIANS

STRONG MEDICINE FOR AMERICA

Growing Momentum

- POCUS Member Interest Group
 - Started in May 2016
 - 358 Active Members



AMERICAN ACADEMY OF
FAMILY PHYSICIANS

STRONG MEDICINE FOR AMERICA

Growing Momentum

- POCUS Curriculum Guideline
 - Contra Costa and Palmetto Health Residency Programs
 - Approved Dec 2016



AMERICAN ACADEMY OF
FAMILY PHYSICIANS

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Growing Momentum

ACGME Program Requirements for Graduate Medical Education in Family Medicine
Summary and Impact of Major Requirement Revisions 2022



<u>IV.C.3.s)</u>	The curriculum should include <u>Residents must have experience</u> <u>in</u> diagnostic imaging interpretation pertinent to family medicine. <small>(Core)</small> [previously IV.C.23.]
<u>IV.C.3.s).(1)</u>	<u>Residents should have experience in using point-of-care</u> <u>ultrasound in clinical care.</u> <small>(Detail)</small>

Can you send me a copy of your curriculum?

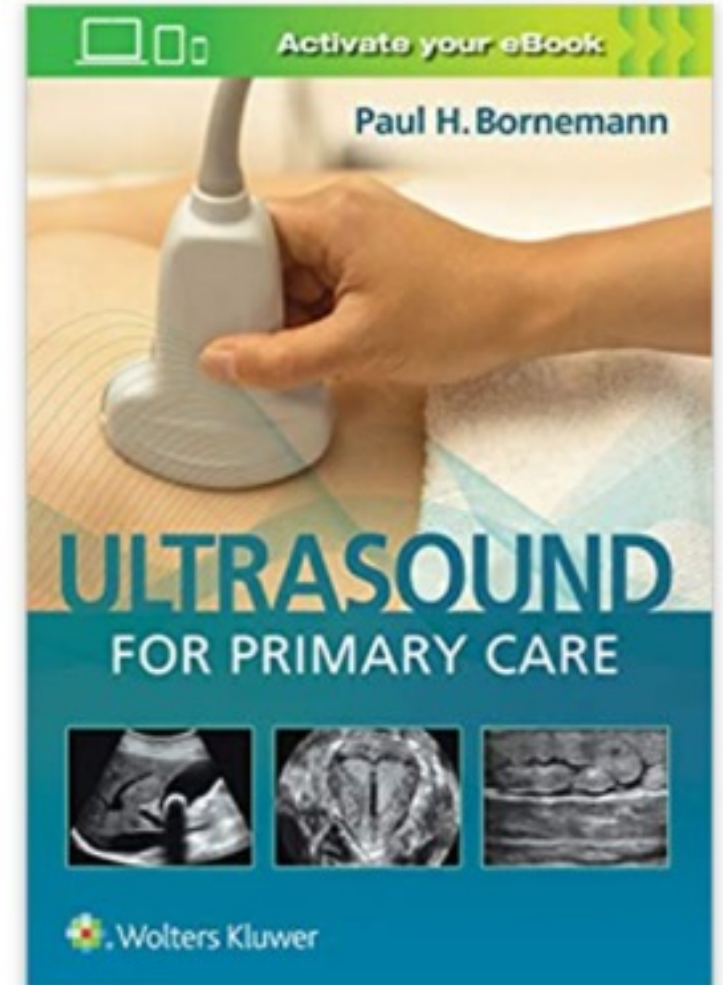
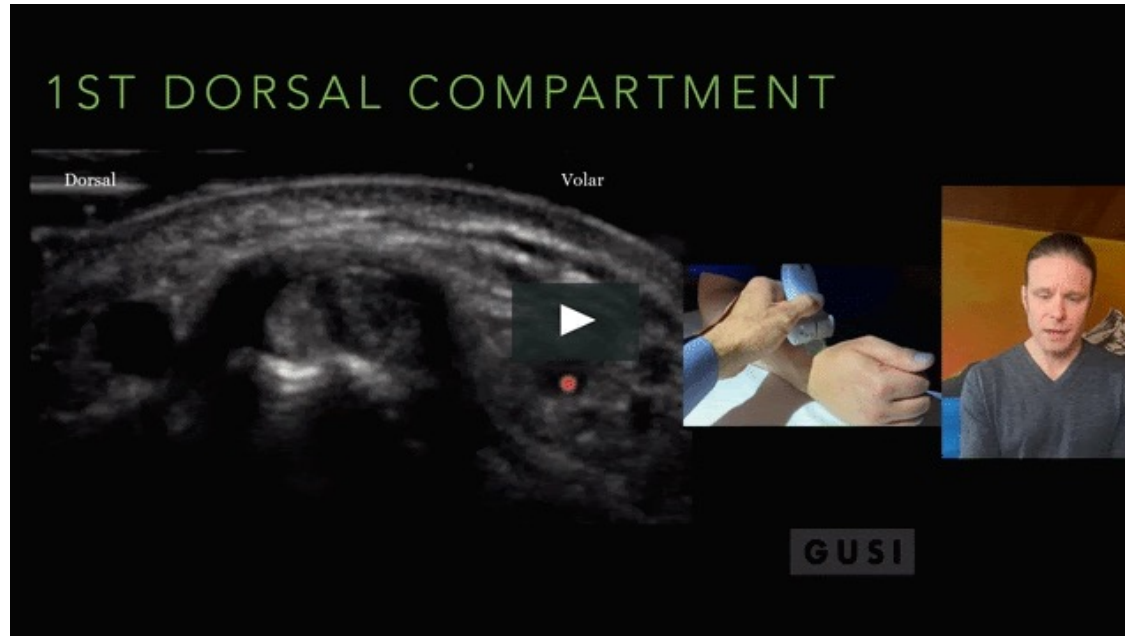
Components of a POCUS Curriculum

- Knowledge Acquisition
 - Taught and self-directed
- Skills Acquisition and Practice
 - Hands-on teaching with simulators, phantoms and models
 - Educational scanning, group or self-directed
- Competency Assessment



Knowledge Acquisition

- Teacher Led
- Self-Directed
 - Videos
 - Reading



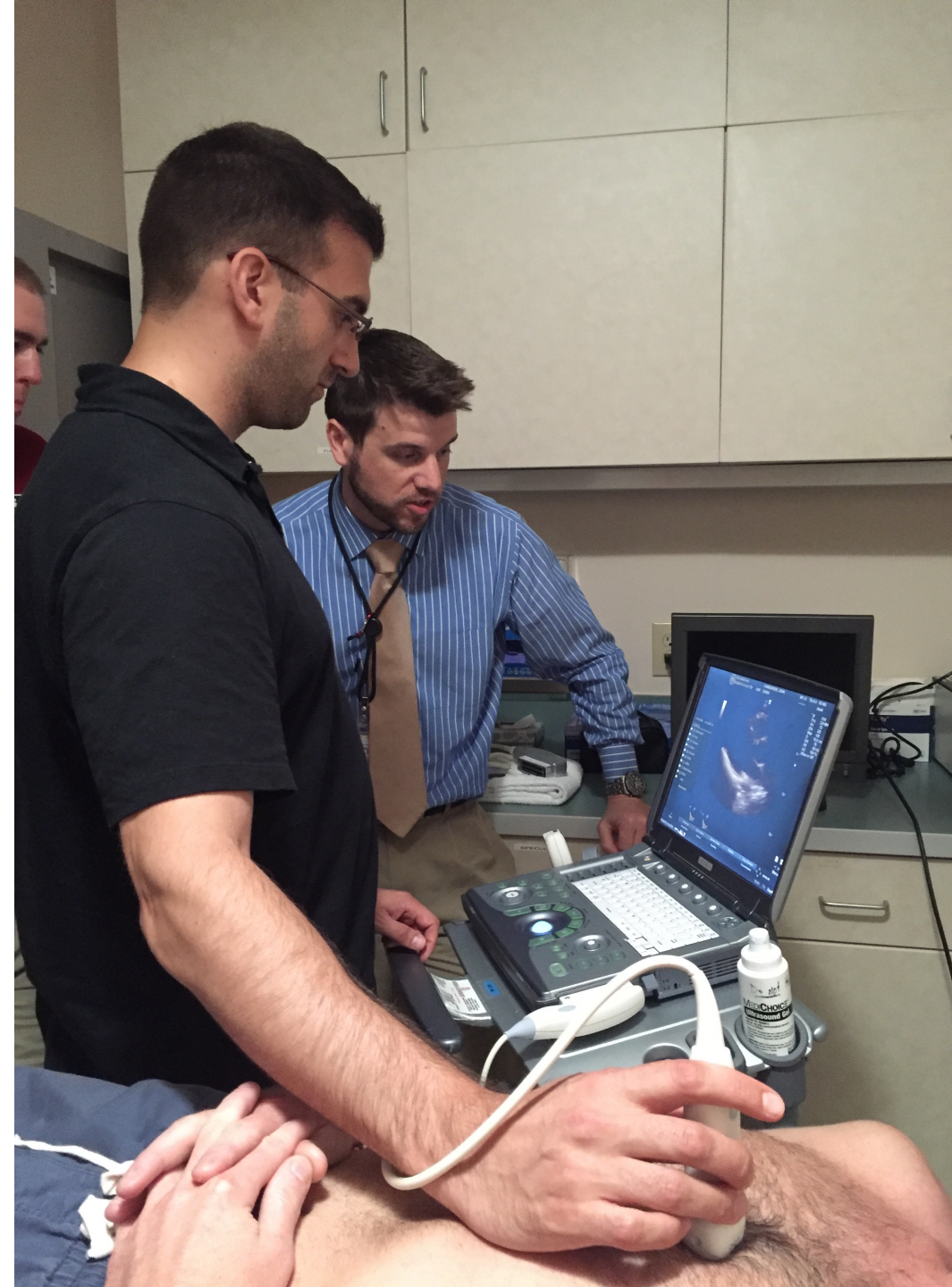
Skills Acquisition and Practice

- Hands-on teaching with simulators, phantoms and models
- Educational scanning, group or self-directed
- Supervised, clinical scanning
- Image Review



Educational Scans

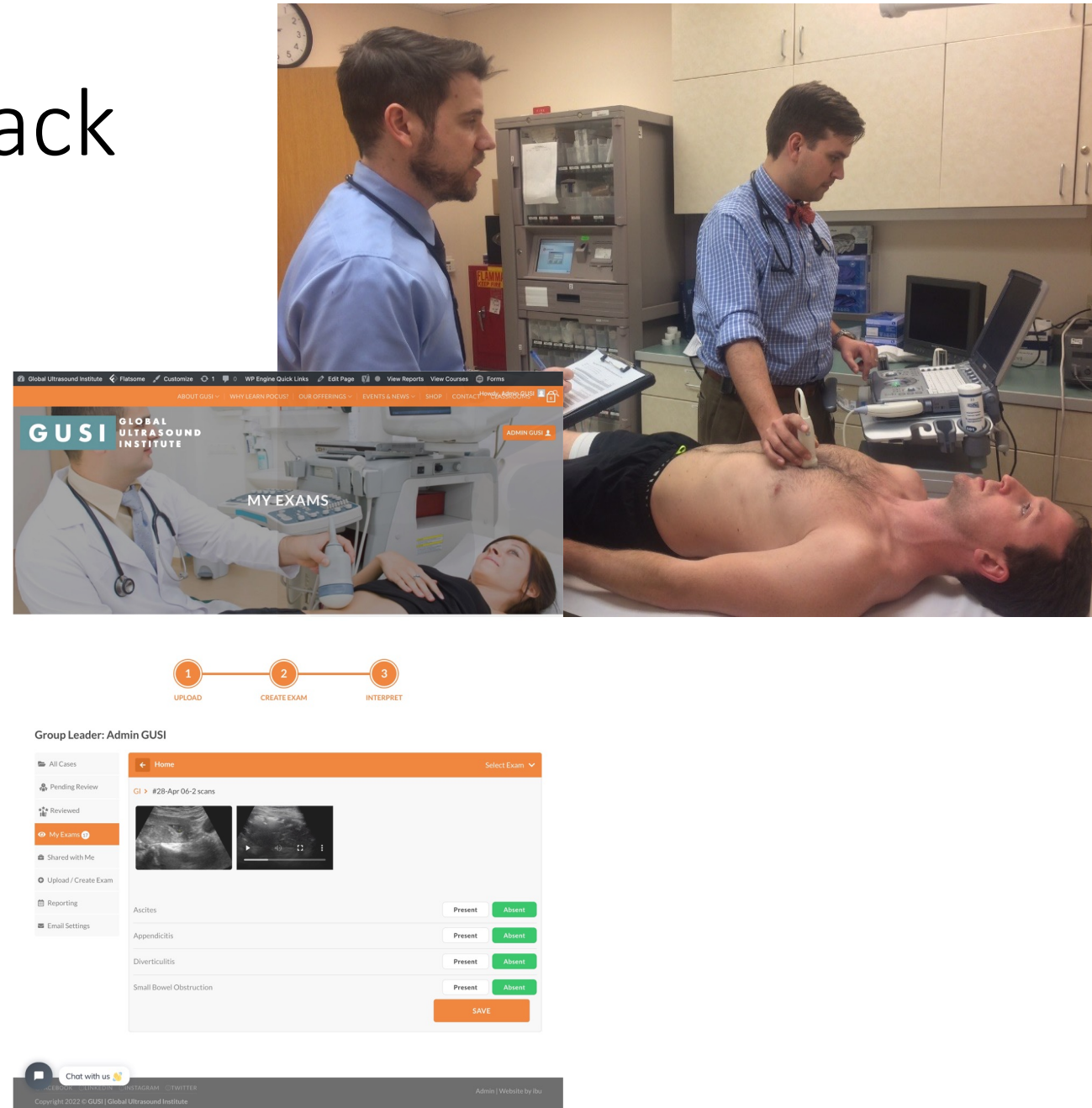
- Verbal informed consent
 - For learning only
 - Cannot provide any results
 - Will not be documented in the chart
 - If concerning findings, attending will be notified
- Documented in procedure log
- Reviewed by faculty



How do you assess if a learner competency
with POCUS?

Evaluation and Feedback

- Quiz including ultrasound images and video loops
- Observed Structured Clinical Encounters (OSCE)
- Standardized Direct Observation Tool (SDOT)
- Graded Image Review



The collage illustrates the GUSI (Global Ultrasound Institute) platform and its application in a clinical setting. The top right image shows two men in a clinical setting, one using an ultrasound machine on a patient. The middle left image is a screenshot of the GUSI website's 'MY EXAMS' section, showing a list of exams and a 'MY EXAMS' button. The bottom image is a screenshot of the 'Interpret' step in the GUSI exam process, showing a list of conditions to be marked as 'Present' or 'Absent'.

1 UPLOAD 2 CREATE EXAM 3 INTERPRET

Group Leader: Admin GUSI

All Cases Pending Review Reviewed My Exam Shared with Me Upload / Create Exam Reporting Email Settings

Home Select Exam

GI > #28-Apr 06-2 scans

Ascites Present Absent

Appendicitis Present Absent

Diversiculitis Present Absent

Small Bowel Obstruction Present Absent

SAVE

Chat with us

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Admin | Website by Idr

Family Medicine Ultrasound Standardized Directly Observed Test

Resident: _____
 Faculty: _____
 Date: _____

	Yes (2 pts)		No (0 pts)
Positions the machine, patient and themselves optimally			
Enters patient information into the ultrasound machine			
Selects the appropriate exam preset for each exam			
Selects the appropriate transducer for each exam			
Has the directional indicator on the correct side for each exam			
	Excellent (2 pts)	Satisfactory (1 pts)	Poor (0 pts)
Abdominal Aorta			
Long axis view of aorta obtained and saved			
Short axis of the proximal aorta obtained and saved			
Short axis of the mid aorta obtained and saved			
Short axis of the distal aorta obtained and saved			
Performs a caliper measurement of at least one short axis image			
Cardiac			
Parasternal long axis view obtained and saved			
Accurately describes LV systolic function as normal or abnormal			
Performs caliper measurements of SWT, LVEDD and PWT at end diastole			
Lung			
Lung sliding image obtained and saved			
Accurately describes A-line or B-line pattern			
Right costophrenic view obtained and saved			
Left costophrenic view obtained and saved			
Inferior Vena Cava			
Long axis view of the inferior vena cava obtained and saved			
Caliper measurements obtained during inspiration and expiration			
Deep Venous Thrombosis Assessment			
Common femoral vein at great saphenous junction obtained and saved			
Popliteal vein obtained and saved			
Both segments adequately assessed for compressibility			
	Final Score		
Total points=			
Total possible=	44		

Instructions to be read to examinees during each portion of the exam:

Aorta

Obtain, label and save one long axis view of the abdominal aorta and one short axis view at the proximal, mid and distal abdominal aorta. Perform a caliper measurement of the largest segment.

Cardiac

Obtain, label and save a video-loop of the parasternal long axis view of the heart. Label your assessment of left ventricular systolic function as either normal or abnormal. Perform caliper measurements of the left ventricular septal wall thickness, posterior wall thickness and end diastolic diameter.

Lung

Obtain, label and save an intercostal image of lung sliding at the anterior right or left mid-clavicular line. Label whether there is a predominately A-line or B-line pattern at that location. Obtain and save images of the right and left costophrenic view.

Inferior Vena Cava

Obtain, label and save a long axis view of the inferior vena cava. Perform caliper measurements during inspiration and when it is widest.

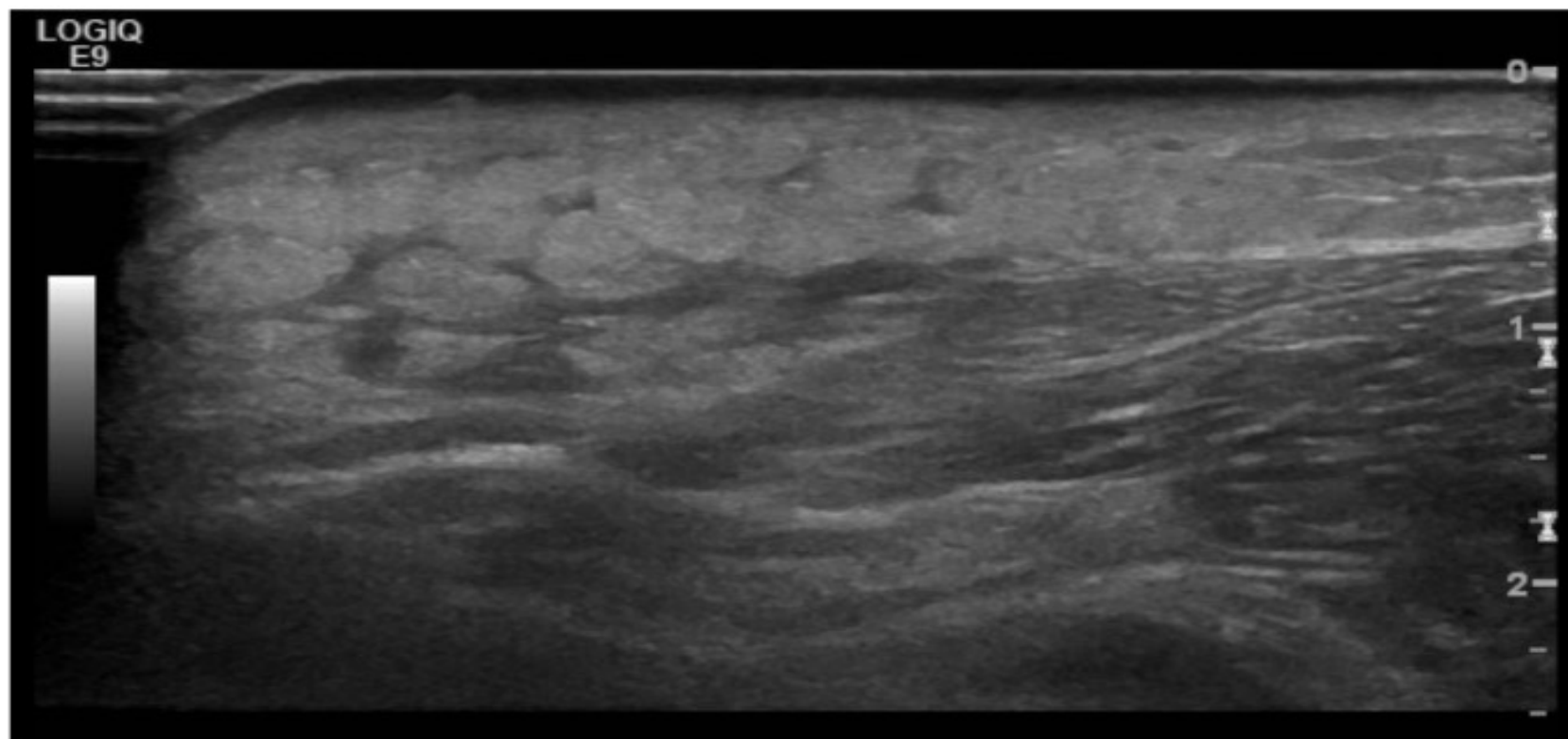
Deep Venous Thrombosis Assessment

Perform a two point compression evaluation for deep venous thrombosis. Label and save images or video-loops of the points you evaluate.

Example of Multiple Choice Quiz Question

Choose the best answer.

24. A 45-year-old male with no past medical problems presents with 3 days of fever, erythema, warmth and tenderness of his left lower extremity. Based on your bedside ultrasound, what is the best initial treatment?



- ☐ A. Incision and drainage (I&D)
⇒ ☒ B. Antibiotics
☐ C. I&D and antibiotics
☐ D. None of the above

Are there any other benefits to having a POCUS curriculum?

Other Benefits of Ultrasound Education

- Resident and faculty research
- Resident Assessment
- Medical student clerkships or electives
- Increased revenue for the department



Can you provide any pearls or pitfalls you have come across while developing POCUS curriculum?

Pearls

- Designate an ultrasound champion on faculty
- Get leadership excited about ultrasound
- Start with something sustainable that can grow
- Collaborate
- Continue to reassess and improve



Pitfalls

- Lack of engaging all stakeholders
- Lack of clear distinction between educational and clinical scanning
- Lack of planning for inertia
- Lack of planning for continuity

