

Point of Care Ultrasound: Development of a Resident-led Family Medicine Curriculum

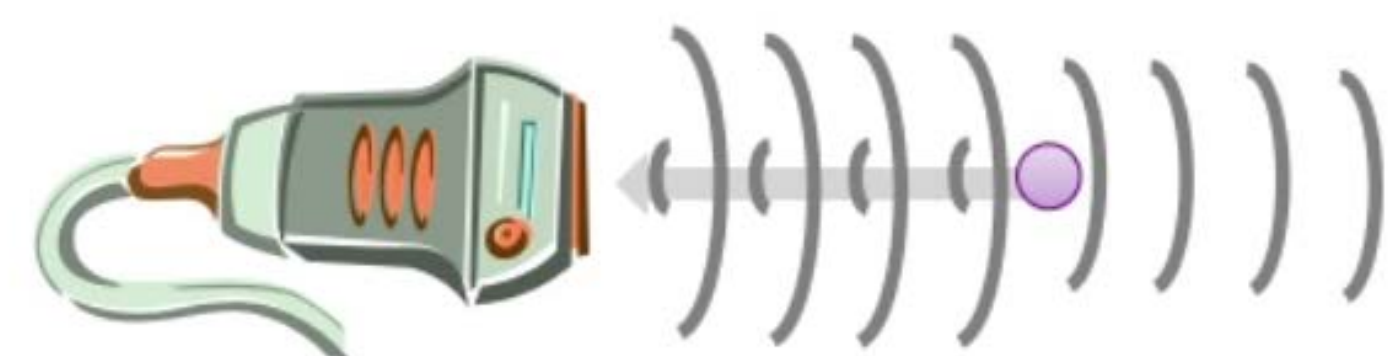
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Introduction

Point of care ultrasound (POCUS) rapidly answers focused clinical questions and expedites diagnostic workups.

The barriers to initiating a family medicine residency POCUS curriculum include a lack of appropriately trained faculty, limited access to ultrasound equipment, and a lack of comfort in interpreting images without a radiologist review⁽⁴⁾.

As such, **the goal of this study** is to assess the development, implementation and effectiveness of a resident-led POCUS curriculum that bypass these barriers.



Methods

Participants: University of Arizona Family Medicine residents were recruited by self-selection, none of whom had prior formal US training.

Study design: Curriculum learning material was adopted from free iBook "Bedside Ultrasound" by Dawson, and assessment tools (questions, images, and videos) and Quiz Star software adopted from 2 other FM residencies in the country.

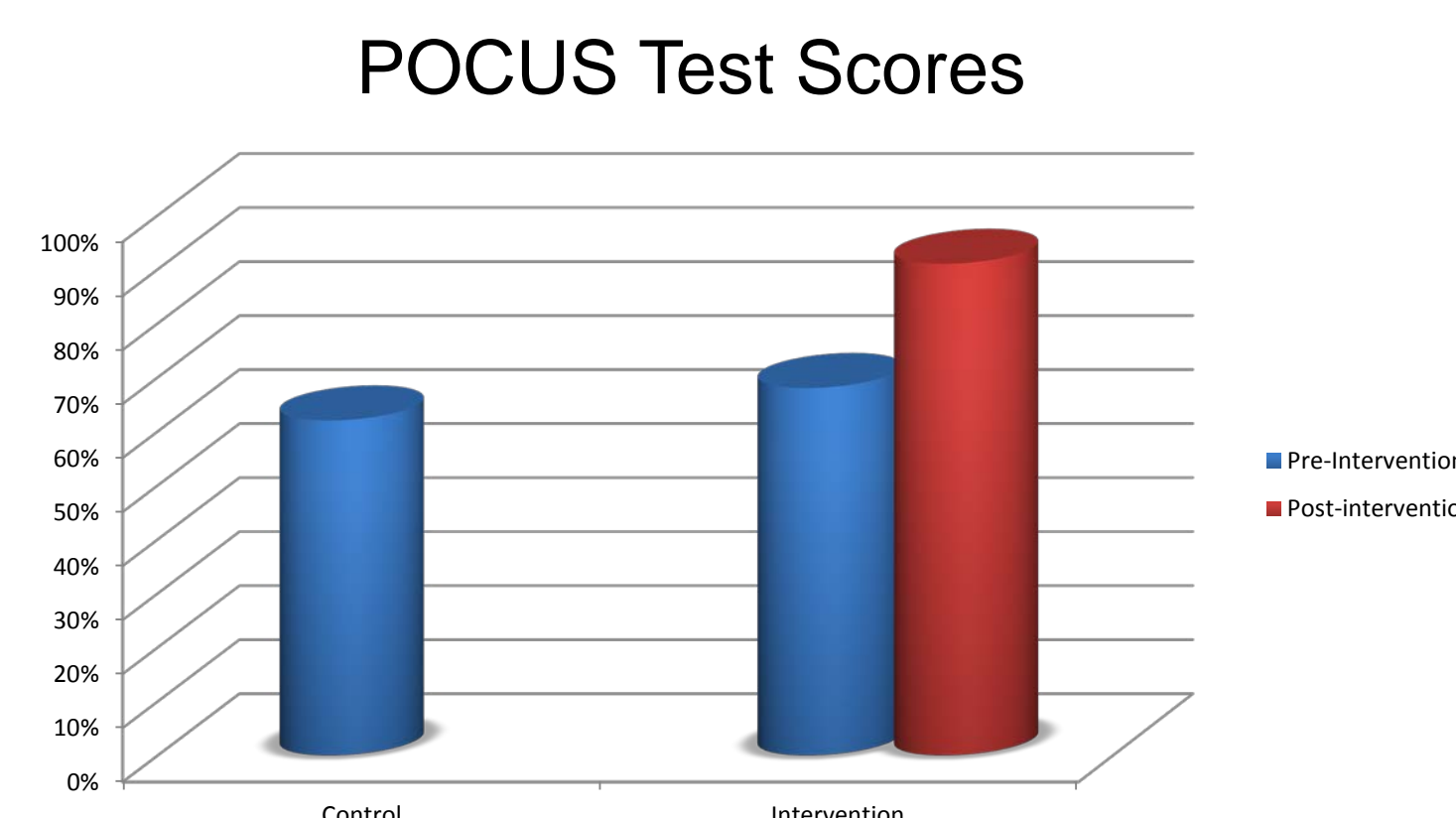
Interventions: Training sessions were resident-led, held monthly, had associated reading chapter for a flipped-classroom experience, and took place at an the outpatient clinic. Scanning subject were volunteers.

Primary measure: The primary outcome measure included knowledge of ultrasound acquisition and interpretation by way of pre- and post- topic multiple choice quizzes with images and videos. Our control are residents within our family medicine program who did not participate in POCUS training. We developed OSCE (observed clinical skills exam) for each sessions.

Analyses: Secondary outcomes will include incidence ultrasound scans within various service rotations (ER, medicine, ICU, sports med etc.) documented via New Innovations and qualitative data on curriculum development.

Results

Nine out of twenty-eight (30%) of the residents functioned as the intervention group and attended the curriculum on a voluntary basis from 2015-2016 academic year, none having had prior training in ultrasound. The control group (19 out of 28 residents) had similar average POCUS competence scores compared to the pre-test intervention group (62% vs. 68%). The post-test competence scores increased by 23% (68% vs. 91%). OSCE (observed clinical skills exams) were created for the curriculum and used by attendees of workshops as protocol guides.



Observed Structures Clinical Exams - UofA Family Medicine POCUS

| Resident: | Grader: | Date: | | |
|---|---------|-------------------|----------------------|--------------|
| General | | Yes (2pts) | | No (0pts) |
| 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) |
| Gallbladder | | | | |
| Assess for cholelithiasis: longitudinal sweep + horizontal sweep | | | | |
| Sonographic Murphy's sign | | | | |
| GB wall thickness | | | | |
| Pericholecystic fluid | | | | |
| CBD dilation | | | | |
| Abdominal Aorta | | | | |
| Long axis view of aorta | | | | |
| Short axis of the proximal aorta | | | | |
| Short axis of the mid aorta | | | | |
| Short axis of the distal aorta | | | | |
| Performs a caliper measurement of at least one short axis image | | | | |
| Echo | | | | |
| Obtains the following views: comments on presence of "3-E's" (a-c): | | | | |
| 1) Parasternal long axis view obtained | | | | |
| 2) Parasternal short axis view obtained | | | | |
| 3) Apical or 4-chamber view obtained | | | | |
| The "3-E's": | | | | |

Figure 2. Example of OSCE checklist

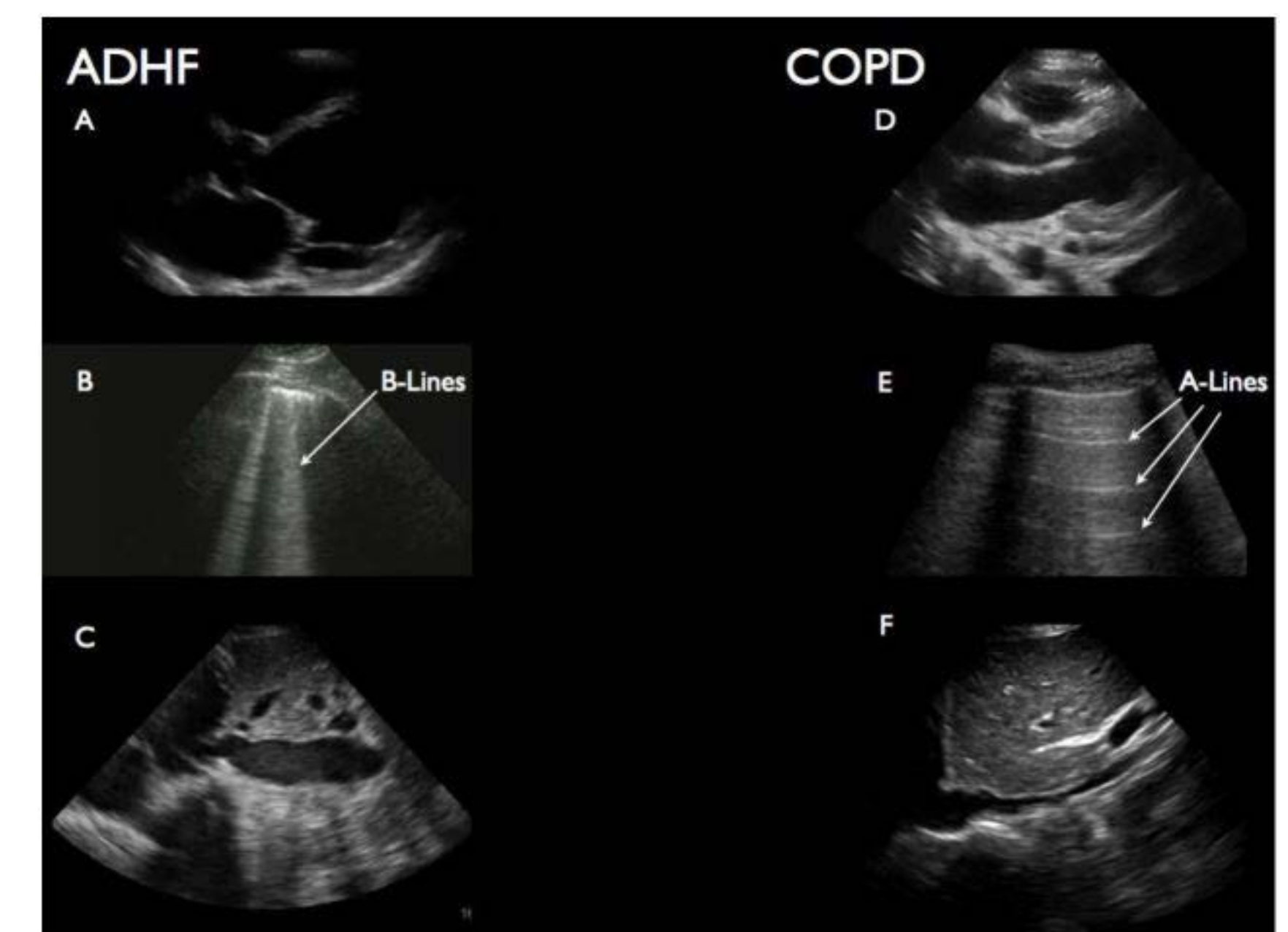


Image 1. Examples of learned POCUS scans with clinical application- multi-organ assessment to diagnose acute dyspnea (ADHF = acute decompensated heart failure; COPD = chronic obstructive pulmonary disease)⁽⁶⁾

Conclusions

- Prior studies show that family doctors can do limited echocardiograms, rapid AAA screening, and rapid DVT evaluation as well as specialists.
- Our resident-led curriculum shows an increase in competency measures in POCUS and knowledge of image acquisition is attainable.
- Limitations: selection bias, sustainability, and long term impact on resident training.
- Implications: With 2% of FM residencies currently have some sort of POCUS training and 20% of FM programs with an US "in development"⁽⁴⁾, it behooves us as a specialty to overcome barriers in resident POCUS training.

References

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