Emergency Ultrasound Training Program in Guyana: Systematic Credentialing Process in a Resource-limited Setting

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ABSTRACT

Ultrasound has become an important skill for emergency physicians. Ultrasound is more crucial in resource-limited settings where diagnostic testing may not be as timely or available at all. In 2015, an emergency medicine ultrasound curriculum was implemented at Georgetown Public Hospital Corporation in Georgetown, Guyana. Implementing an ultrasound-training curriculum in Guyana had four main challenges: limited ultrasound equipment, lack of informational technology infrastructure to record and review ultrasound examinations, availability of local emergency ultrasound expertise, and competing educational needs within the curriculum. These challenges were met with creative solutions and the formation of a formalized curriculum and credentialing process. The experience of creating the program is described along with the curriculum, credentialing process, and plan for sustainability. Since implementation, every graduating resident has displayed competency on final assessment.

In 2010, the Department of Emergency Medicine at Vanderbilt University Medical Center partnered with the University of Guyana and Georgetown Public Hospital Corporation (GPHC) to form the masters in emergency medicine residency program. Previously, emergency medicine did not exist in Guyana. The 3-year program, centered at the only tertiary referral hospital in Guyana, provides training in emergency medicine to physicians in Guyana and surrounding Caribbean countries.

The technical skill to operate an ultrasound machine, the ability to interpret emergency ultrasound (EUS) examinations, and incorporate examination findings into the clinical care of patients became important components of emergency care in Guyana where access to other advanced imaging (computed tomography) is limited. With increasing use of ultrasound in the accident and emergency (A&E) without structured training during

residency, the need to ensure quality and consistent EUS training became vital to the success of the training program. An EUS training curriculum was created at GPHC with three goals: quality, high-level training for the emergency medicine residents; consistent training despite variation in visiting faculty; and a plan for sustainability.^{1,2}

Implementing an EUS training curriculum in Guyana encountered four main challenges: limited ultrasound equipment, lack of informational technology infrastructure to record and review ultrasound examinations, availability of local EUS expertise, and competing educational needs within the curriculum. A formalized curriculum and credentialing process was created to address these challenges. Curricular adjustments were designed to avoid additional strain on limited resources.

Each challenge requires a unique solution. The lack of ultrasound equipment was addressed by the generosity of the Vanderbilt University Emergency Medicine

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Table 1
Evidence-based Ultrasound Curriculum Structure

Application	Required No. of Scans	Observed by EUS Expert	Observed Structured Assessments	Citation
E-FAST	50	10	First/third year	Atkinson et al. ⁴
Cardiac	50	10	First/third year	Chisholm et al. ⁷
Renal	30	8		Jang et al. ⁸
Biliary	25	8	Third year	Jang et al., ⁹ Gaspari et al. ¹⁰
Aorta	25	8	First year	Hoffmann et al. ¹¹
Pregnancy	30	10	First year	MacVane et al. ¹²
Pulmonary	25	5	First year	Volpicelli et al. ¹³
Other (misc.) applications	15			
Total	250			

residents. They generously donated a dedicated machine for the A&E. The traditional means of EUS feedback via image storage and interpretation on a picture archiving and communication system was not possible. Providing quality assessment and consistency between each of the residents requires multiple solutions: hands-on training provided by triannual scheduled visiting EUS fellowship-trained faculty, directly observed scans by EUS trained faculty during these visits,³ observed structured assessments,^{4,5} and minimum number requirements for each application⁶ (Table 1). The minimum number of ultrasound examinations is carefully crafted based on the available research and making adjustments for the relevant pathology and relevant treatments in the region. For example, there is less emphasis on diagnosis of abdominal aortic aneurysm because there is currently no available treatment in Guyana. Each examination is recorded in a logbook. A portion of these examinations requires direct observation by a EUS expert who provides feedback and assesses and records technical and interpretive proficiency. EUS competency is established when all requirements are met and residents demonstrate competency during hands-on scanning.

While EUS-trained faculty cannot be present year-round, non-fellowship-trained visiting faculty provide oversight and feedback of clinical EUS examinations. Recently, the EUS-credentialed residency graduates provide real-time feedback to current residents. EUS didactics delivered by visiting EUS experts, online asynchronous material, and hands-on instruction during clinical shifts help prevent crowding with the competing educational needs in the curriculum.

Since implementation in 2015, the program has graduated nine residents. Each resident has successfully completed the requirements and displayed

competency in the final observed structured assessment. An important step toward sustainability will occur in 2019, when a residency graduate will complete an EUS fellowship. This will provide sustained presence of an EUS expert to oversee the curriculum.

EUS is a powerful diagnostic tool in resource-limited settings. We faced several barriers implementing an EUS training program. Obtaining a dedicated ultrasound machine was crucial. EUS fellowship-trained faculty visits, online asynchronous didactics, dedicated hands-on scanning, observation of clinical scans, and a final observed structured assessment were key to establishing EUS competency in our trainees. Our solutions can be adapted to other locations that face similar challenges.

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