

Getting It Right the First Time: Defining Regionally Relevant Training Curricula and Provider Core Competencies for Point-of-Care Ultrasound Education on the African Continent

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Significant evidence identifies point-of-care ultrasound (PoCUS) as an important diagnostic and therapeutic tool in resource-limited settings. Despite this evidence, local health care providers on the African continent continue to have limited access to and use of ultrasound, even in potentially high-impact fields such as obstetrics and trauma. Dedicated postgraduate emergency medicine residency training programs now exist in 8 countries, yet no current consensus exists in regard to core PoCUS competencies. The current practice of transferring resource-rich PoCUS curricula and delivery methods to resource-limited health systems fails to acknowledge the unique challenges, needs, and disease burdens of recipient systems. As emergency medicine leaders from 8 African countries, we introduce a practical algorithmic approach, based on the local epidemiology and resource constraints, to curriculum development and implementation. We describe an organizational structure composed of nexus learning centers for PoCUS learners and champions on the continent to keep credentialing rigorous and standardized. Finally, we put forth 5 key strategic considerations: to link training programs to hospital systems, to prioritize longitudinal learning models, to share resources to promote health equity, to maximize access, and to develop a regional consensus on training standards and credentialing. [Ann Emerg Med. 2016;■:1-9.]

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BACKGROUND

Many countries on the African continent have well-known high burdens of trauma and unacceptably high all-cause mortality among emergency department (ED) patients (2.2% to 12.3%).¹⁻⁴ This occurs, in part, because of limited access to basic and advanced laboratory facilities, along with limited diagnostic imaging equipment availability, including radiographs and computerized tomography (CT). As a result, point-of-care ultrasound (PoCUS) has gained increasing recognition as an important tool for these clinical environs.

Despite this recognition, there remains limited use of PoCUS by local emergency medicine providers on the African continent. Reasons for this vary, but lack of portable ultrasound machines, poor access to reliable electrical power, limited consumable supplies (gel), and lack of adequate training with rigorous standards and credentialing are certainly primary constraints. Additionally, locally initiated educational programs often lack necessary resources and technical expertise, whereas externally (high-income countries) initiated programs

often lack coordination between learners and teachers, longitudinal mentorship, and context appropriateness pertaining to local disease patterns. These limitations preclude program longevity and local sustainability.⁵⁻⁷

Quality training programs in Africa's emergency care settings hold immense potential to affect preventable morbidity and mortality, to improve diagnostic capability, and improve health equity. As leaders in emergency medicine from 8 African countries and local stakeholders, we initiate this dialogue to lay the groundwork for developing high-quality sustainable and collaborative emergency medicine PoCUS educational programs. Toward this end, we propose a novel PoCUS curriculum, developed by expert consensus, to establish core competencies grounded in functionality and contextualized to local epidemiology and resources. Furthermore, we propose a continent-wide coordinating structure to ensure quality training, credentialing, and revalidation of skills throughout the region. We also present 5 key strategies as a foundation to enhance collaborative best practices for PoCUS development on the African continent.

DEFINING RELEVANT PoCUS CORE COMPETENCIES

This conversation is timely and imperative because interest and engagement in emergency medicine on the African continent has significantly increased during the past decade. Dedicated postgraduate emergency medicine residency training programs now exist in 8 countries (Figure 1). Individuals involved in each of these programs report educational initiatives in PoCUS, but training appears to vary greatly, and there have been minimal efforts to coordinate educational resources within and between countries. South Africa is a notable exception, with 5 domestic programs (all members of the College of Emergency Medicine of South Africa), each of which follows a curriculum of the Emergency Medicine Society of South Africa, accredited by the College of Emergency Medicine of South Africa. An extensive review of the literature identified only summaries of other PoCUS use, with descriptive reports from EDs in Rwanda, South Africa, Democratic Republic of Congo, and Ethiopia.⁸⁻¹⁰

ALGORITHMIC APPROACH

To start, we recommend that programs adopt core competencies based on local disease and illness within infrastructure and training limitations. We suggest PoCUS be used early in a patient's presentation, with algorithm-, organ-, and procedural-based scans triggered by presenting signs and symptoms.¹¹ Throughout settings as varied as the slum areas of Kibera, conflict zones of the Democratic Republic of Congo, or relatively affluent areas of Dar Es Salaam, a majority of the population lacks access to primary care, sufficient laboratory testing, radiographs, and CT scan imaging modalities. The lack of imaging modalities can be profound; North Kivu Province, Democratic Republic of Congo (population of 6 million), has no functional CT scanners and only 25 inconsistently functional radiograph machines, the Mozambique public health system (serving 20 million) has only 3 CT scanners, and the South African public health system (serving 4 million) has only 15 CT scanners. This lack of access often contributes to a delay in diagnosis that then results in advanced illness, complex

Emergency Medicine Residency Programs	
Ethiopia	Addis Ababa University
South Africa	University of Cape Town Stellenbosch University University of KwaZulu-Natal Pretoria University University of the Witwatersrand
Republic of Tanzania	Muhimbili University National Hospital MUHAS
Sudan	Omdurman Teaching Hospital University of Bahri
Egypt	Egyptian Fellowship - MOHP
Botswana	Princess Marina Hospital
Ghana	Komfo Anokye Teaching Hospital
Uganda	Makerere University
Post-graduate EM Training Programs	
Rwanda	University of Rwanda College of Medicine and Health Sciences
Kenya	Aga Kahn University Hospital
Democratic Republic of Congo	HEAL Africa Hospital Kindu General Hospital



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Figure 1. Emergency medicine training programs on the African continent. Postgraduate training programs were defined as local Ministry of Health-recognized emergency medicine residency programs, fellowship programs (post-medical school), and emergency medicine technical officer training programs. The authors requested the assistance of the African Federation of Emergency Medicine to compile this list. It is possible we missed a program.

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