

# A Practical Guide to Self-Sustaining Point-of-Care Ultrasound Education Programs in Resource-Limited Settings

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The value of point-of-care ultrasound education in resource-limited settings is increasingly recognized, though little guidance exists on how to best construct a sustainable training program. Herein we offer a practical overview of core factors to consider when developing and implementing a point-of-care ultrasound education program in a resource-limited setting. Considerations include analysis of needs assessment findings, development of locally relevant curriculum, access to ultrasound machines and related technological and financial resources, quality assurance and follow-up plans, strategic partnerships, and outcomes measures. Well-planned education programs in these settings increase the potential for long-term influence on clinician skills and patient care. [Ann Emerg Med. 2014;64:277-285.]

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## BACKGROUND

In resource-limited settings, diagnostic imaging modalities are often constrained, frequently limited to plain film radiography. A number of articles have demonstrated the value of point-of-care ultrasonography in such settings.<sup>1-3</sup> Point-of-care ultrasonography provides a low-cost, efficient method to aid in the diagnosis and management of many conditions in resource-limited settings, including maternal and peripartum care, heart failure, diarrheal illness, tuberculosis, and trauma.<sup>4-6</sup> It can also decrease procedural complications.<sup>7</sup> It allows one caregiver to perform, interpret, and act on a diagnostic test, which can save both time and resources.<sup>8,9</sup>

Recent articles have described the use of point-of-care ultrasonography in Rwanda, Zambia, Liberia, Ghana, Haiti, and Tanzania.<sup>4,10-15</sup> As ultrasound machines become more portable and affordable, coupled with increasing capacity to transmit digital images for remote review, the introduction of point-of-care ultrasonography may have a transformative effect on health care in resource-limited settings. As a result, there is increasing interest in delivering ultrasound education programs in low- and middle-income countries.<sup>4,13-17</sup> However, there is little published guidance on how to establish effective and sustainable point-of-care ultrasound programs in resource-limited settings.<sup>18</sup> In accordance with available literature and international experience of the authors, we aim to provide a practical overview of how to design and implement an ultrasound education curriculum leading to the establishment of a sustainable resource-limited setting ultrasonography program.

Our approach to program development is directed at achieving a transition from initial educational initiatives, likely supported

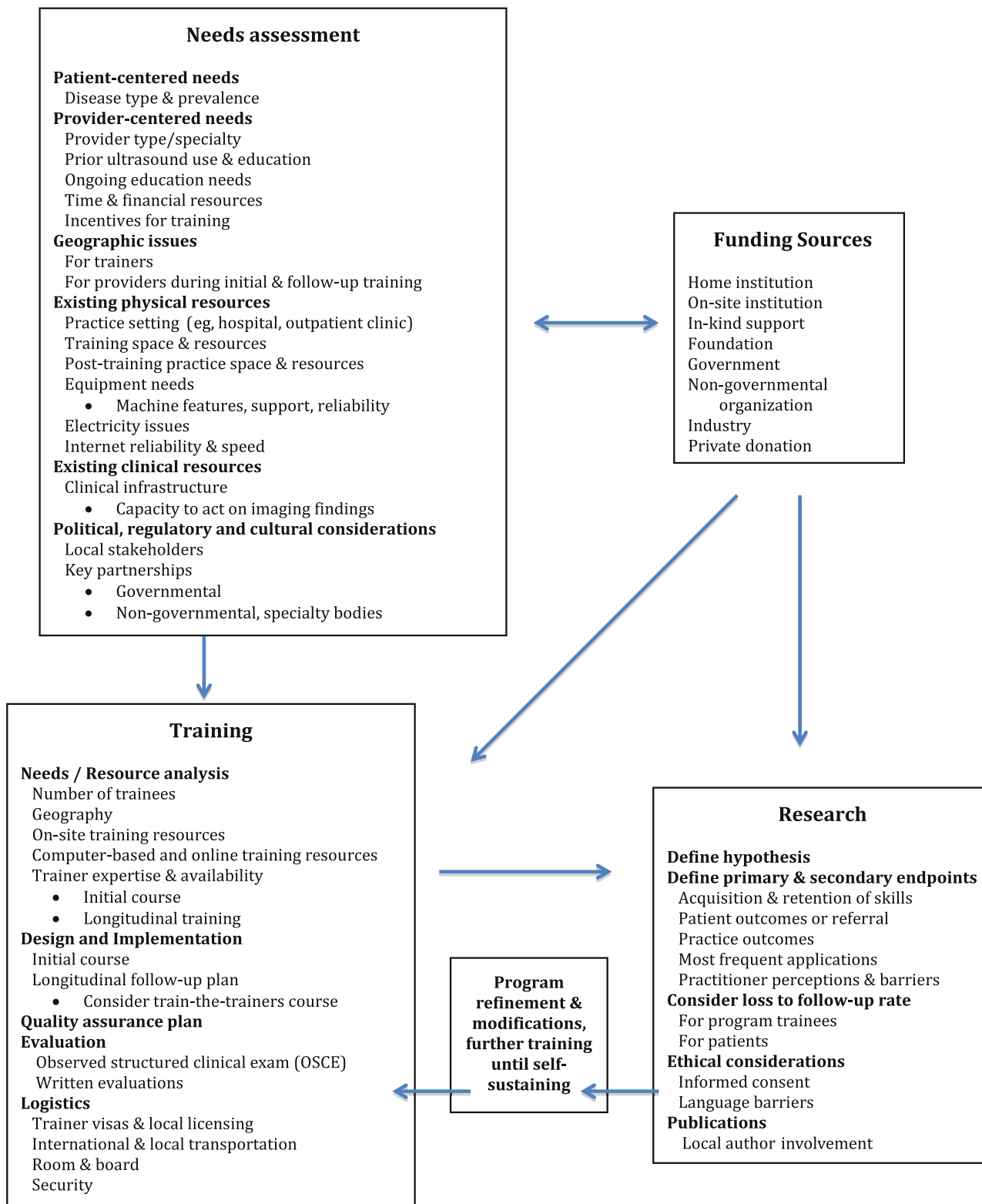
by educators primarily from outside the training site, to the development of a stable, locally administered, point-of-care ultrasonography program with the capacity to provide training for other users in the resource-limited settings. This model has been used in a range of locations and disciplines of medicine and surgery.<sup>19-23</sup> We emphasize the importance of beginning this process with a needs assessment to ensure a locally appropriate curriculum, and describe other core aspects of program development, including trainee selection, essential partnerships, equipment selection and maintenance, initial training implementation, competence assessment, quality assurance, research, funding, and logistics.

## NEEDS ASSESSMENT

The critical first step to resource-limited settings program development is a thorough needs assessment,<sup>24-27</sup> which ensures that new ultrasound programs will be tailored to local capacity and clinical requirements. Factors to consider include the patient population, prospective trainees, local and regional resources of the health care system, and identification of other stakeholders. **Figure 1** illustrates an overview of the needs assessment process and pathways to program development.

## Defining Objectives

The needs assessment for a point-of-care ultrasound program aims to define and prioritize clinical needs and anticipate the resources required to meet them.<sup>27</sup> Unmet clinical needs and objectives can be determined by collecting



**Figure 1.** Assessment, design, and implementation of ultrasound training program in resource-limited setting.

information from stakeholders, including patients, clinicians, administrators, and government agencies. Needs assessment methods might include questionnaires, structured interviews,

focus group discussions, direct observation of clinicians in their practice setting, and patient chart and health statistics review. Consulting with leadership from the hospital, health system, and

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