

EFSUMB statement on medical student education in ultrasound [short version]

EFSUMB Statement zur sonographischen Ausbildung von Studenten

Authors

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Key words

- teaching
- guideline
- recommendation

Abstract

The European Federation of Societies for Ultrasound in Medicine and Biology (EFSUMB) recommends that ultrasound should be used systematically as an easy accessible and instructive educational tool in the curriculum of modern medical schools. Medical students should acquire theoretical knowledge of the modality and hands-on training should be implemented and adhere to evidence-based principles. In this paper we summarise EFSUMB policy statements on medical student education in ultrasound.

Zusammenfassung

Die Europäische Ultraschallgesellschaft EFSUMB (European Federation of Societies for Ultrasound in Medicine and Biology) empfiehlt die systematische Lehre von Ultraschall als Teil des modernen universitären (studentischen) Curriculums. Medizinstudenten sollten im Rahmen Evidenz-basierter Lehrkonzepte theoretisches Wissen erwerben und praktische Übungen durchführen. In dem hier vorgestellten EFSUMB Positionspapier werden Kernaussagen der sonografischen Studentenausbildung zusammengefasst.

Introduction

“Education is the most powerful weapon which you can use to change the world”

(Nelson Mandela)

Ultrasound is an effective method used throughout the world for clinical work-up of patients with a wide range of diseases, particularly as first line imaging modality. Technological advancements have made the equipment accessible and affordable up to hand-held ultrasound devices that are now about the size of a smart phone [1–3]. Moreover, hand-held ultrasound has the potential to extend the physical examination validating the doctor's clinical findings. Technological progress has opened new perspectives to ultrasound (US) clinical applications. Accordingly, education and subsequently preparation and updating of US knowledge become crucial [4]. EFSUMB (European Federation of Societies for Ultrasound in Medicine and Biology) [5] and others [6] have published an atlas on anatomy and examination technique of handheld devices.

Medical student education is traditionally based on “classical” training methods such as presentations, courses and workshops. However, new tech-

nologies and web-based sources of information have opened novel educational applications in medical practice [7].

Ultrasound scanning by students is among the most recently introduced subjects in the medical curriculum [8]. Some universities and authors have advocated that US can be effectively used to teach medical anatomy and physiology, not only for diagnostic imaging [9–12]. The ultrasound equipment may be used in order to generate educational content for medical students and residents. Some authors have referred to it as the “sonoscope” or “echoscope” highlighting the use of US as a tool even more important than the stethoscope [3, 13, 14]. The use of US beyond departments of radiology has often been termed “point of care” US. Furthermore, some medical schools, taking advantage of recent technical advances in portable US technology, have started to incorporate education in US within the medical school curriculum [9–11, 15, 16].

In 2011, Hoppmann reported their first 4 years experience at the University of South Carolina of Medicine where an integrated ultrasound curriculum was introduced across the 4 years of the School of Medicine for all the students [9]. More

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DOI <http://dx.doi.org/10.1055/s-0035-1566959>
Published online: 2016
Ultraschall in Med 2016; 37:
100–102 © Georg Thieme
Verlag KG Stuttgart · New York ·
ISSN 0172-4614

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recently, Baltarowich et al [17], proposed a two-fold curriculum organized as follows:

- ▶ Pre-clinical: Utilization of US to enhance student understanding of anatomy, physiology and pathology.
- ▶ Clinical: Teach students how to use US effectively as a problem-solving tool in the diagnosis of disease.

Preclinical curriculum

If an ultrasound curriculum is integrated into the overall curriculum it has the potential to supplement the general understanding of anatomy, physiology and pathology [18]. This horizontal incorporation of an US curriculum is probably best organized and implemented by a multidisciplinary group including internal medicine, radiology, and other US specialists with the course directors of the anatomy, physiology, and pathophysiology preclinical courses. Hands-on sessions can also be incorporated into a physical diagnosis course. Ideally, the curricular content would be taught in didactic lectures and small-group sessions, enriched by the experience and contribution of US imaging experts. This would include 1 or 2 introductory lectures in US physics, image acquisition, indications and limitations. Alternatively, some medical schools may choose a more vertical approach, assigning specific hours to ultrasound imaging for didactics and workshops to cover the complete preclinical curriculum.

In the horizontal and vertical integrated form of curriculum the clinical ratio increases to the end of study. US curriculum has to follow an organ and topic based module system (movement, circulation, respiration, digestion, inflammation, coordination, etc.) and has to involve clinical parts from the beginning to the end [19–22].

Clinical curriculum

Some models of US education have been developed. One offers graduated levels of exposure and imaging experience for medical students during third-year clerkships (Harvard Medical School, Boston, USA) [23]. The second model is more compact, organized as a dedicated 3-day program (Thomas Jefferson University Hospital, Philadelphia, USA) [17]. With the current wide variability in clinical clerkship requirements, it is conceivable that a student could complete a medical school curriculum without ever directly scanning a patient with US. Although not optimal, the authors recognize that US imaging is largely skill based and requires hands-on training to achieve competency. To achieve this goal in a busy clinical setting, the “teach-the-teacher” concept can be applied to recruit experienced students for US teaching. Furthermore, these concepts can be extended by blended learning methods which have a positive and supporting effect on US education [24]. It could be shown that undergraduate ultrasound tuition is an achievable educational goal which is well received by medical students [25].

Students also need to learn the limitations of US and recognize situations when other imaging modalities may be more appropriate. Although current medical school curricula have little room for additional content, didactics and teaching, we believe that it is essential to include the basics of US in the greater framework of general medical education [26–28].

In conclusion we refer to the words from Solomon et Saldana: “A generation of physicians will need to be trained to view this

technology as an extension of their senses, just as many generations have viewed the stethoscope. That development will require the medical education community to embrace and incorporate the technology throughout the curriculum” [29].

EFSUMB Strategy

EFSUMB has prepared an EFSUMB Course Book (ECB) [30], EFSUMB Course Book Student Edition (ECBSE) [31], Atlas on echoscopy [5] and teaching videos (anatomy, examination technique) [32] which are free to download from the EFSUMB website (www.efsumb.org) [33].

EFSUMB has decided to establish a separate Student Committee in the federation that will promote student education and relevant activities in Europe. EFSUMB is now undertaking work to make new bylaws and recruit students from different European countries in an interim board. Furthermore, EFSUMB plan to integrate a new Student Congress with future Euroson congresses. The Educational and Professional Standard Committee (EPSC) of EFSUMB aim to initiate and monitor international co-operative studies on student training in medical ultrasound. The steps proposed are:

- ▶ To review the present knowledge on student education and the previous reported experiences.
- ▶ To forward an official letter as a consequence of the above mentioned survey informing the different universities who answered, and to all the National Universities including the student representative organizations about the proposal of EFSUMB for the inclusion of US in the medical education core curriculum.
- ▶ To provide e-learning resources that can be used for US student education, e.g. EFSUMB educational portal.
- ▶ To inform relevant Medical Schools throughout Europe about the recommended curriculum and the available resources in EFSUMB, and to promote the implementation of US education.
- ▶ To launch a one-year prospective integration of anatomy and physiology teaching by means of US in 4–6 selected universities and providing specific appendix of core curriculum.

EFSUMB recommends that ultrasound should be used systematically as an easily accessible and instructive educational tool in the curriculum of modern medical schools. Medical students should acquire theoretical knowledge of the modality and hands-on training should be implemented and adhere to evidence-based principles. In our opinion, it is due time to introduce US education programs at European Universities to provide our students knowledge and skills to be able to take care of patients' diagnosis and therapy in the best possible way.

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Acknowledgment

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We acknowledge advice from Florian Recker, Germany.

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