

Medical Student Ultrasound Education, a WFUMB Position

Paper, Part I, response to the letter to the Editor

Christoph F Dietrich^{1,2}; Beatrice Hoffmann³; Vito Cantisani⁴; Yi Dong⁵; Roman Hari⁶; Harvey Nisenbaum⁷; Delwyn Nicholls⁸; Christian Pállson Nolsøe⁹; Maija Radzina¹⁰; Florian Recker¹¹; Andreas Serra¹²; Linda Sweet¹³; Sue Westerway¹⁴; Michael Blaivas¹⁵

Affiliations

¹Department of Internal Medicine 2, Caritas Krankenhaus, Bad Mergentheim, Germany.

²Ultrasound Department, The First Affiliated Hospital of Zhengzhou University, Zhengzhou, China

³Harvard Medical School, Department of Emergency Medicine, Beth Israel Deaconess Medical Center, Boston, USA

⁴Department of Imaging Diagnostics, Policlinico Umberto I, University Sapienza, Rome, Italy

⁵Department of Ultrasound, Zhongshan Hospital, Fudan University, 200032 Shanghai, China

⁶Universität Bern, Berner Institut für Hausarztmedizin (BIHAM), Leiter Lehre Gesellschaftsstrasse 49, 3012 Bern, Schweiz

⁷Department of Medical Imaging, Penn Presbyterian Medical Center, Philadelphia, Pennsylvania, USA.

⁸College of Nursing and Health Sciences, Flinders University, Adelaide, Australia, Sydney Ultrasound for Women, Address Level 4, 45-47 York St, Sydney, NSW, Australia

⁹Ultrasound Section, Division of Surgery, Dep of Gastroenterology, Herlev Hospital Copenhagen Academy for Medical Education and Simulation Ultrasound Section, University of Copenhagen, Denmark

¹⁰Diagnostic Radiology Institute, Paula Stradina clinical university hospital, Riga, Latvia; University of Latvia; Radiology Research Laboratory, Riga Stradins University

¹¹Department of Obstetrics and Gynecology, University hospital Bonn, Germany
Sono Education Academy, University hospital Bonn, Germany

¹²Department of Internal Medicine and Nephrology, EFSUMB Learning Center, Klinik Hirslanden, Zürich, Switzerland

¹³College of Nursing and Health Sciences, Flinders University, Adelaide, Australia

¹⁴School of Dentistry & Health Science Charles Sturt University NSW Australia

¹⁵University of South Carolina School of Medicine, Department of Emergency Medicine, St Francis Hospital, Columbus Georgia, USA

Correspondence

Prof. Dr. med. Christoph F. Dietrich

Medizinische Klinik 2, Caritas Krankenhaus Bad Mergentheim

Uhlandstr. 7, D-97980 Bad Mergentheim, Germany

Tel: 49 (0)7931 - 58 - 2201 / 2200

Fax: 49 (0)7931 - 58 - 2290

Christoph.dietrich@ckbm.de

The authors of the WFUMB Position paper read with great interest and welcome your appeal concerning student ultrasound education. The letter to the editor raised interesting observations of scientific evidence that shows improvement of medical student performance when exposed to ultrasound during medical school. They concluded their letter stating that: "Ultrasound teaching should be integrated in all medical school curricula, as this increases capability with using the device and confidence in interpreting the ultrasound image, thus making us competent when practicing as clinicians".

Obviously, as a large group of experienced academics familiar with the power of ultrasound when placed into the hands of a clinician, we strongly support this appeal. But we are also aware of the road ahead and the many potential impediments that need to be overcome to accomplish this goal for all medical school settings. This will require a strong buy in and collaborative effort of all parties involved. We believe the best results will be accomplished when all involved stakeholders work on this goal in parallel. For instance, interested medical student groups can develop a local grass root or peer-teaching environment (1-4) developing collaborative relationships with their medical school teaching faculty and administrators, and making their voices heard when it comes to their desire to include ultrasound education into future curriculum activities. Local teaching faculty familiar with diagnostic ultrasound and interested in providing ultrasound education should develop and advertise these student learning initiatives. Their input and effort would be invaluable to establish initial learning

sessions. Once the success becomes obvious and there is significant demand from the student side and available faculty is identified, we are convinced medical school administrators will be open to accommodate student-driven change into their curriculum.

From the point of international and national ultrasound societies, the World Federation of Ultrasound in Medicine and Biology (WFUMB) and its federation societies can assist with educational and content guidance. In fact, WFUMB and its federations already started collaborative initiatives to introduce ultrasound learning into medical school educational practice.

WFUMB has also created a communicating platform - a group for medical students where they can learn and share experiences via discussions, videos, images and posts with other medical students and educators with a special interest in ultrasound across the world. An invitation for the Medical Students to join the WFUMB Medical Student Network Group has been posted through Social Media and also on the WFUMB website (<https://emea01.safelinks.protection.outlook.com/?url=www.wfumb.org&data=02%7C01%7Cchristoph.dietrich%40ckbm.de%7Cdf48d06a432e4411bf1e08d67bf2af28%7C69b885a87f214daab779a60c1c3a49e6%7C1%7C0%7C636832680483125174&sdata=sUrQ4P1of3q3SLWdRvwYWRv2DHWKBlwSCJ21FFMDGHY%3D&reserved=0>).

We also agree that ultrasound education for medical students should start as early as possible in the curricula. For the integration of ultrasound education into the medical school curricula, some points need clarification and open questions remain to discuss (5, 6).

We agree that an inexperienced physician requires more time to learn how to use an ultrasound machine and this additional time could theoretically add to clinical treatment time if learning is inserted into clinical practice rather than being carried out during specific training times. There is research (7) showing that for some applications only limited scanning practice is needed to obtain a pre-defined level of competence. Nevertheless, we agree that reaching a level of proficiency for sonographic techniques requires time and regular practice. However, this should not discourage the learner from moving forward and becoming familiar with ultrasound. Ultrasound imaging is largely skill based and requires hands-on training to achieve competency. Portable ultrasound devices are becoming increasingly more common as continued miniaturization of ultrasound had led to tablet- or smartphone-sized ultrasound devices (8). This is in no way a disadvantage for inexperienced users, but rather can lead to increased utilization.

In the response to the letter to the editor, we point out open questions to solve in the future that will require the collaborative effort of the learning students, the local educators, and ultrasound and educational societies with their broad expertise on the subject.

This list is by no means complete and further attention should focus on:

- When to start student medical ultrasound education (preclinically, clinically)?
- Should there be a required minimum knowledge and skill level for a graduating medical student?
- Does learning ultrasound improve the performance of physicians?
- Which quality indicators for medical student ultrasound education can be developed?
- How can we achieve standardization of teaching and assessment of US
- What are the funding needs?
- Where can additional funding be obtained?
- How can we address political and diplomatic issues e.g., (ownership of ultrasound equipment, who is organizing ultrasound training)?
- What is the difference between ultrasound learning during medical school and thereafter (resident, registrar, general practitioner, internal medicine, emergency medicine, surgery, radiology, etc.)?
- How can we achieve acknowledgement of qualifications?
- How best is ultrasound taught to undergraduate students?

Diagnostic Ultrasound has come knocking on the doors of medical schools. The interest of medical students to learn and work with this technology and to embrace its full high-end diagnostic capacity seems overwhelming and is steadily growing. It will require all stakeholders, from student-learners to teachers, administrators and national and international ultrasound societies to participate proactively.

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