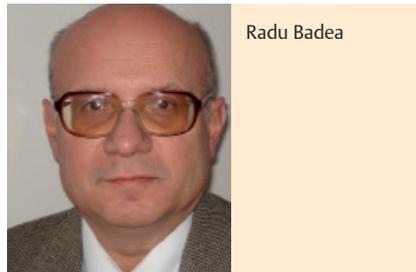


## Ultrasound education

# A Major Step For Medical Student Education

In the last decade, ultrasound examination has undergone extremely interesting technological developments. The range of procedures has diversified, the classic two-dimensional ultrasound technology has evolved into 3D/4D technology, and Doppler ultrasound has been complemented by image processing procedures. Intravenous contrast ultrasound examination is rapidly expanding and elastography has become a standard method in many clinical applications. Endocavitary ultrasound is the most efficient imaging procedure in detecting small and deep lesions. Simultaneously, newer smaller, portable, and even miniaturized equipment has appeared. There is also the idea of connecting the transducers to smartphones. The technology of wireless transmission of ultrasound information is being developed. Ultrasound examination is available in extreme situations such as in an ambulance, helicopter or even outer space. Similarly, the range of clinical applications has diversified a lot, going through a process of clinical integration. Ultrasound is now accessible to all medical specialties, the only condition being a structured training in order to obey the rules of good governance and practice.

Despite the great progress that the method has gone through, it still remains operator-dependent. Obviously, knowing the basic principles of ultrasound and assimilating a specific language are important elements that enhance this procedu-



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re as an imaging diagnostic entity. The integration of clinical data and understanding the situations when „ultrasound helps the clinical diagnosis“ are complemented by situations in which „clinical diagnosis helps validate the ultrasound image“.

Education in ultrasound is perhaps more important than other imaging techniques. This concept is well understood and applied by EFSUMB (European Federation of Societies for Ultrasound in Medicine and Biology).

But what could be the impact of the use of ultrasound in medical schools? This is a challenge worth considering!

Ultrasonography can be an educational „tool“ in medicine. Heartbeat, normal and pathological blood flow, fetal activity, digestive dynamics are physiological events that could be better explained using ultrasound. There is anatomical information that can be illustrated using ultrasound and can sometimes be more useful to the medical student than the dissection of a corpse. Classical semiology could be com-

plemented by ultrasound methods in order to complete the patient's physical examination. Then, once the relationship between the medical student and the patient is set, ultrasound becomes the diagnostic tool integrated in the clinical judgment. Further, there is the clinically integrated feature and the value of the ultrasound method as part of the elementary clinical gestures: inspection, palpation, percussion, auscultation and, why not, „sonographic visualization“. The medical student must finally consider ultrasound as a natural step of his medical examination. The same goes for the resident physician.

How can this goal be achieved? First, medical schools prove that the concept is both modern and natural. Evidence is needed and medical literature started publishing extremely encouraging experiences. The students involved in such projects are very content, they feel the acceleration of the educational process and the teachers confirm this. There is need for restructuring or curricular additions. One must understand that 21st century medicine allows education by means of imaging and ultrasound may be at the forefront of this concept. It requires the use of simulators in order to help exercise ultrasound guided invasive gestures. Simple, miniaturized equipment is needed for teaching. Therefore, the support of the companies producing this equipment is necessary. What else can be done?

Organizing conferences on educational topics focused on ultrasound; Involving medical students;

- ▶ Organizing student sessions in addition to national and international ultrasound conferences;
- ▶ Training courses for the education of the students;
- ▶ Identifying medical schools interested in participating in such projects;
- ▶ Developing models to be followed, exchanging in order to increase the quality and efficiency of teaching.

EFSUMB proposes an addition to the educational paradigm addressed to medical students by introducing ultrasound on all levels of training. It is a good step for the method and even better for medical practice.

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