



Editorial

Teaching Ultrasonography to Spanish Rheumatologists: 15 Years of Experience[☆]

Enseñanza de ecografía en la reumatología española: 15 años de experiencia

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Musculoskeletal ultrasound has been established in the practice of rheumatology over the last decade as a valuable tool that improves diagnosis and is useful to monitor and treat of our patients.^{1,2} Almost all Spanish rheumatologists practicing musculoskeletal ultrasound have been trained by the School of Ultrasound of the Spanish Society of Rheumatology (SER). Is now a good time to remember the early days, to review this and reflect on the future of education of this imaging technique.

Institutionalized teaching of musculoskeletal ultrasound in Spanish rheumatology begins with the creation of the School of Ultrasound of the SER, in late 1996, after the fellowship, a year before, of Drs. Esperanza Naredo and Lucy Butler in the department of radiology at Henry Ford Hospital in Detroit (USA).³ Dr. Manuel Figueroa Pedrosa, then president of the SER, and Drs. Emilio Martin Mola, Armando Roca Laffon placed their bets on this young technique which seemed to show a promising new horizon in clinical research related to our specialty. The SER organized a course in the summer of 1996 conducted by Dr. Jose Antonio Bouffard, a radiologist at Henry Ford Hospital, a pioneer and one of the most experienced persons in musculoskeletal ultrasound in the world, in collaboration with a group of then young rheumatologists excited about this new imaging tool, Drs. Jacqueline Uson, Lucia Butler and Esperanza Naredo. Twenty rheumatologists participated in that course after a strict selection out of hundreds of applications based on strategic and geographic criteria. Among the students of this course came the first group of professors from the School of Ultrasound of the SER, which taught the first U.S. training course for rheumatologists at the end of that year. In the following years, the school was expanded in stages based on the number of teachers and the demand for training of members of the SER, selecting them among rheumatologists who had demonstrated their involvement in the development and practice of ultrasound and who had attended and passed a demanding “training of trainers” course

with a final assessment of competence, mentored by the more experienced teachers at the school.

Currently, the school has 16 teachers in 5 locations, Madrid, Barcelona, Seville, Alicante, and Santiago de Compostela. Since 2006, the school offers a structured educational system with 4 levels of training for rheumatologists and 2 levels for residents of Rheumatology (see [Annex 2](#)). The courses are classroom-style; they spend most of the time in practice with healthy models and patients in small groups of 4 students per teacher. The educational system follows the European recommendations⁴ and offers continuing education with provision of materials prior to the courses, tutorials established between courses and supervised gradual proficiency assessment by teachers of the school. Different pharmaceutical companies have funded the training in ultrasound through the SER, Abbott Laboratories being the main sponsor for the past years. Our school has organized and/or participated significantly in the training in ultrasound in Europe (Musculoskeletal ultrasound courses, the European League Against Rheumatism [EULAR] Sonoanatomy EULAR courses) and other continents. The demand for training in musculoskeletal ultrasound by members of the SER has grown progressively in the past 15 years, but since 2004 the demand shows a much sharper rise. This date is key because since then most of the Spanish rheumatology units acquired an ultrasound through research projects that generated more instructors, sponsored by the SER and funded by the pharmaceutical industry through the SER.^{5–7}

In recent years, demand exceeds supply training for teaching ultrasound to rheumatologists, despite the increased number of teachers and courses in the School ([Fig. 1](#)). In particular, the demand for access to education in rheumatology ultrasound between residents has soared in the last 3 years ([Fig. 2](#)), a logical fact explained by the rapid expansion of ultrasound in our field, especially in Europe⁸ and the lack of an ultrasound training program developed under the National Specialty program.

The resident training program in rheumatology was developed in 2002 and published in the Official Gazette in October 2009.⁹ This places the ultrasound as an important and highly recommended technique along with synovial needle biopsy, infiltration under ultrasound or fluoroscopic control, infiltration of the lumbar spine (epidural and facet), peripheral nerve block anesthesia, pedometry, radiosynovectomy, and bone densitometry. This same program is seen as basic and essential as arthrocentesis, synovial fluid analysis, identification of crystals and intraarticular and

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^c [Annex 1](#) lists the members of the School of Ultrasound.

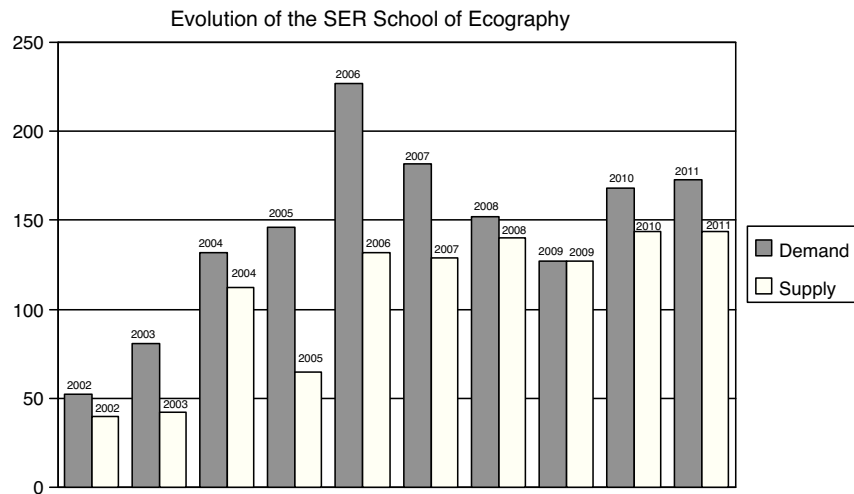


Fig. 1. Evolution of supply and demand of the SER School of Ecography from the year 2002. X-axis: number of SER members.

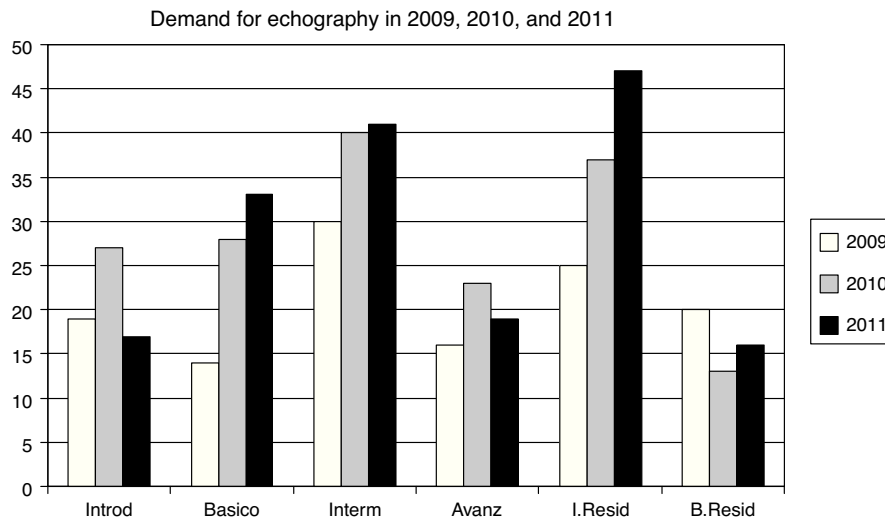


Fig. 2. Demand for locomotor system echography for each course offered by the school of Echography in 2009, 2010 and 2011. X-axis: number of SER members; Y-axis: courses. Intro: Introductory course for rheumatologist; basico: basic course for rheumatologists; interm: intermediate course for rheumatologists; avanz: advanced course for rheumatologists. I resid: introductory course for rheumatologists. B resid: Basic course for rheumatology residents.

periarticular injections. To date, our specialty has no other tool as powerful as ultrasound in its intrinsic ability to be both diagnostic and therapeutic, both in practice and in clinical research. In turn, it is the technique of our specialty that requires the most training. Therefore, it is logical that when the units approved to train resident physicians have enough qualified teachers in ultrasound, this technique will be in the place it deserves as a basic and essential technique in rheumatology and as a essential teaching target in specialty training. Until then, the School of Ultrasound of the SER, with the National Commission of Rheumatology (CNR), should look not only for training the residents in ultrasound, but also training ultrasound unit teachers. In conclusion, we in the School of Ultrasound of the SER and the RNC are confident in being able to properly train our future rheumatologists in an art that no longer belongs to the future and is a present and necessary reality.

Acknowledgments

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Annex 1.

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Annex 2. Levels, Duration and Objectives of the Courses of the School of Ultrasound of the SER

Introductory course for rheumatologists and residents (20 hours)

Objectives:

- Knowledge of the applications, indications and limitations of musculoskeletal ultrasound.
- Knowledge of the physical and technical aspects of musculoskeletal ultrasound.
- Knowledge of the artifacts in musculoskeletal ultrasound.
- Management of the basic parameters of the gray scale ultrasound equipment.
- Knowledge of ultrasound anatomy.
- Mastering the technique of ultrasound, systematized and standardized in the following regions of the musculoskeletal system: shoulder, elbow, wrist, hand, hip, knee, ankle and foot. Interpretation of ultrasound images of normal anatomy of the musculoskeletal system.
- Documentation of the images.

Basic course for rheumatologists and rheumatology residents (20 h)

Objectives:

- Ability to identify the sonographic semiology of the following essential rheumatic conditions: shoulder, elbow, wrist, hand, hip, knee, ankle and foot, synovitis in all synovial recesses in each joint, bursitis, tenosynovitis, tendon calcification, complete tendon rupture.
- Recognition of artifacts in musculoskeletal ultrasound.
- Optimization of ultrasound images through the parameters of the gray scale ultrasound equipment.
- Preparation of reports and documentation of images.

Intermediate course for rheumatologists (20 hours)

Objectives:

- Ability to identify the sonographic semiology of the most common disorders of the rheumatic shoulder, elbow, wrist, hand,

hip, knee, ankle and foot: joint effusion and synovial hypertrophy in all synovial recesses in each joint, ganglion, bursitis, tenosynovitis, tendinosis, enthesopathy, tendinous calcifications, partial and complete tendon rupture, plantar fasciitis, abnormal cortical lesion of the median nerve at the wrist, muscle breakdown.

- Ability to perform ultrasound-guided punctures in the musculoskeletal system.

Advanced course for rheumatologists (40 hours)

Objectives:

- Ability to diagnose common musculoskeletal disorders and to perform complex diagnostic musculoskeletal ultrasound: differentiation between joint effusion and synovial hypertrophy, tendon ganglions, intrasubstance tendon injuries, tendon erosions, tendon subluxation and impingement, ligament injuries, differential diagnosis of cortical abnormalities, peripheral nerve injury, muscle injury, injury and calcification of articular cartilage, meniscal injuries.
- Ability to perform ultrasound-guided punctures of the musculoskeletal system.
- Knowledge of the physical and technical principles of Doppler and color power Doppler.
- Management of the basic parameters of Doppler ultrasound equipment.
- Application of power Doppler images in grayscale.
- Detection and quantification of inflammatory activity in synovitis and enthesitis by power Doppler.

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