

EFSUMB competency requirements for rheumatologists who perform musculoskeletal ultrasound (MSUS)

Level 1

Level 1: Theoretical Module

Attendance in a basic and intermediate MSUS course, each of at least 18 hours and at least 50% of supervised practical sessions during the last 3 years (for beginners) or at least 2 update MSUS courses during the last 5 years for rheumatologists with experience in performing MSUS. The required MSUS courses should be endorsed by national or international scientific societies. The content of these courses should include the following topics:

- Application, indications and limitations of MSUS in rheumatology.
- Ultrasound physics and technology
- Sonographic pattern of the different musculoskeletal tissues
- MSUS artefacts and pitfalls
- Standard sonographic scans of the shoulder, elbow, wrist and hand, hip, knee, ankle and foot
- Holding the probe and optimizing the grey-scale settings of the system
- Image documentation
- Reporting ultrasound findings and diagnosis
- Colour and power Doppler physics and technology
- Application, indications and limitations of colour and power Doppler in rheumatology
- Use and optimization of colour and power Doppler settings
- Colour and power Doppler artefacts
- Use of colour and power Doppler to detect synovial and enthesal inflammation
- Assessment of synovial, tenosynovial and enthesal inflammatory activity with B-mode and Doppler
- Assessment of structural joint damage (bone, cartilage, tendons, ligaments)
- Sonographic-guided periarticular and intra-articular injections
- Ultrasound detection of the following pathologies: joint synovitis (i.e. synovial hypertrophy and joint effusion), tenosynovitis, bursitis, enthesopathy, paratenonitis, tendinosis, complete tendon tear, partial tendon tear, tendon impingement, bony cortex abnormalities (i.e. bone erosions, enthesophytes, osteophytes), ganglia and cysts, articular cartilage lesions, peri- and intra-articular microcrystal deposit, and MSUS calcification

Level 1: Practical Training

Level 1 competence requires:

- To obtain level 1 status it is recommended that the trainee should perform a minimum of 300 joint region examinations (different joints) under supervision (as listed in the competency assessment sheet) within 1 year.
- Examinations should encompass the full range of conditions listed in the competency assessment sheet - level 1.
- A log book (or an illustrated log book) should be kept by the trainee, listing the number and type of examinations and reporting and documenting the ultrasound findings. Supervision of half of the 300 examinations can be achieved with approval of examinations in an illustrated log book.
- The trainee should be supervised by a level 2 or 3 practitioner.
- During the course of training a competency assessment sheet should be completed and signed by

the supervisor, as this will determine in which area(s) the trainee can practise independently.

- To maintain level 1 status the practitioner is expected to perform at least 300 examinations each year.

Level 1: Competencies to be acquired

At the end of training the trainee should be able to:

- Perform common musculoskeletal ultrasound examinations (shoulder, elbow, wrist/hand, hip, knee, ankle/foot and muscles) systematically, accurately, safely and with proper report and documentation.
- Differentiate normal from common pathological findings listed in the competency assessment sheet - level 1.
- Recognize when referral for an additional opinion is indicated (e.g. any diagnostic doubt), both from more experienced colleagues or by use of other imaging techniques.
- Diagnose common abnormal ultrasound findings as listed in the competency assessment sheet - level 1.
- To perform basic US-guided interventions.

Level 2

Level 2: Theoretical Module

Attendance in an advanced MSUS course of at least 18 hours and including at least 50% of supervised practical sessions during the last 3 years (for beginners) or at least 1 update MSUS course during the last 3 years for rheumatologists with long experience in performing US. The required MSUS courses should be endorsed by national or international scientific societies. The content of those courses should include the following topics:

Quantification of synovial, tenosynovial and enthesal inflammatory activity.

Quantification of structural joint damage (bone, cartilage, tendons, ligaments).

Role of ultrasound in vasculitis

Evaluation of vessels and detection of vasculitis by ultrasound

Pediatric sonography: musculoskeletal sonoanatomy and pathological findings in rheumatic diseases

Sonographic-guided musculoskeletal interventional procedures

Uncommon sonographic pathological findings in rheumatology

Ultrasound of other anatomic areas involved in rheumatic diseases (e.g. salivary glands)

Three-dimensional MSUS

MSUS technological advances (e.g. sonoelastography, fusion imaging)

Update on MSUS in rheumatology

MSUS research and methodology

Ultrasound detection of the following pathologies: intrasubstance tendon lesions, tendon subluxation/ luxation, dynamic tendon abnormalities, peripheral nerve entrapment, ligament lesions, fibrocartilage lesions, myositis, muscle injury, soft tissue masses, loose bodies, foreign bodies

Level 2: Practical Training

Level 2 competence requires:

- To have achieved level 1 competence.
- To have regular MSUS clinics at level 1 and perform at least 500 examinations under supervision within a year.
- Supervision by a level 3 practitioner or a practitioner who has achieved level 2 competence and has at least 2 years of experience at that level.
- To be able to recognize and correctly diagnose almost all musculoskeletal abnormalities.
- To maintain level 2 status the practitioner is expected to perform at least 500 examinations each year.

Level 2: Competencies to be acquired

- To accept and manage referrals from level 1 practitioners.
- To have knowledge of new ultrasound modalities.
- To teach ultrasound to trainees and to level 1 practitioners.
- To recognize and correctly diagnose the pathologies included in the competency assessment sheet - level 2.
- To perform complex musculoskeletal US-guided interventions.

Level 3

Level 3: Theoretical Module

Fulfilled the requirements of the level 2 and attendance in at least 1 “teach the teachers” MSUS international course or having been a teacher in at least 2 international endorsed MSUS courses (any level of European League Against Rheumatism (EULAR) or endorsed EULAR US courses, or European musculoskeletal US courses) during the last 3 years.

Level 3: Practical Training

Level 3 competence requires:

- To have achieved level 2 competence.
- To conduct rheumatology MSUS research and publish the results in peer reviewed scientific papers (at least 1 publication in the last 5 years). To be co-author or co-investigator is accepted.
- To be teacher in endorsed US courses (any level of EULAR or endorsed EULAR US courses, or European MSUS courses) at least 1 course every 3years.

Level 3: Competencies to be acquired

- To accept and manage patients tertiary referrals from level 1 and 2 practitioners.
- To perform all sorts of musculoskeletal US-guided interventions or biopsies or performing some kind of specialized MSUS (e.g. pediatric, salivary glands, etc).
- To conduct substantial research (clinical or fundamental) in the field of rheumatology MSUS.
- To teach MSUS to trainees and practitioners at all levels.
- To be aware of and to pursue developments in rheumatology MSUS.

Maintenance of Skills

Having been assessed as competent to practice there will be a need for continued medical education and maintenance of practical skills. Recommended numbers of examinations to be performed annually to maintain skills at each level are given in the text. Practitioners should:

- Include rheumatology MSUS in their ongoing continued medical education (CME) and continued professional development (CPD).
- Audit their practice.
- Participate in multidisciplinary meetings.
- Keep up to date with relevant literature on MSUS.