

Appendix 12

Minimum Training Requirements For The Practice Of Medical Ultrasound In Europe

This curriculum is intended for clinicians who perform Musculoskeletal Ultrasound and it includes standards for theoretical knowledge and practical skills. EFSUMB purpose in preparing these recommendations is to achieve some level of training especially for level 1 but each country will need to follow their own regulations.

Musculoskeletal ultrasound comprises a wide range of different examinations increasingly performed by practitioners with different background (e.g. radiology, orthopaedic surgery, rheumatology or paediatric). This curriculum is intended for medical doctors who perform musculoskeletal ultrasound scans. It includes standards for theoretical knowledge and practical skills.

Training should be integrated in a 3-level system and modular, as some practitioners may need to be proficient in some specific areas of the musculoskeletal pathology according to their daily practice (e.g. shoulder surgery, hand surgery, paediatrics or rheumatic diseases). At least level 1 competence should be obtained by anyone performing routine unsupervised musculoskeletal ultrasound.

Level 1

Level 1: Theoretical Module

Attendance in a basic course of at least 3 days (18 hours) including:

- ▶ Ultrasound physics and instrumentation, ultrasound techniques and administration (see Appendix 2).
- ▶ Normal musculoskeletal anatomy, normal musculoskeletal ultrasound findings, common pathological ultrasound findings in the musculoskeletal system.

Level 1: Practical Training

competence requires:

- ▶ To obtain level 1 status it is recommended that the trainee should perform a minimum of 300 examinations under supervision within a 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. 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 should 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 common muscles) systematically, accurately, safely and with proper report and documentation.
- ▶ Differentiate normal and pathological findings.
- ▶ Perform dynamic examinations.
- ▶ Recognise when referral for a second opinion is indicated (e.g. any diagnostic doubt, soft tissue tumours).
- ▶ Acquire knowledge about advantages, disadvantages and indications of alternative imaging modalities (e.g. MRI).
- ▶ Diagnose common abnormal ultrasound findings in shoulder, elbow, wrist/hand, hip, knee, ankle/foot and common muscles (e.g. effusion and synovitis, bursitis and cysts, tendon tears and tendinopathy, entesopathy, common muscle and bone pathology) (see competency assessment sheet - level 1).

Level 2



Level 2: Theoretical Module

Attendance in one or more relevant advanced courses or congresses with a total of at least 3 days (18 hours).

Level 2: Practical Training

competence requires:

- ▶ To have achieved level 1 competence.
- ▶ To have regular ultrasound clinics at level 1 and perform at least 500 examinations under supervision within a year.
- ▶ Supervised by a level 3 practitioner or someone who has achieved level 2 competence and has at least 2 years of experience at that level.
- ▶ To be able to recognise and correctly diagnose almost all musculoskeletal pathological conditions (or all conditions within a specific area of a musculoskeletal pathology).
- ▶ To maintain level 2 status the practitioner should 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 conduct some research (clinical or fundamental) in musculoskeletal ultrasound.
- ▶ To recognize and correctly diagnose almost all pathology in the shoulder, elbow, wrist/hand, hip, knee, ankle/foot, muscles, bones and nerves (see competency assessment sheet - level 2).
- ▶ To perform basic, non-complex musculoskeletal US-guided interventions (e.g. aspirations, injections, drainages, biopsies).

Level 3



Level 3: Theoretical Module

Attendance in at least two advanced relevant courses or congresses with a total of at least 6 days during 2 calendar years.

Level 3: Practical Training

competence requires:

- ▶ To have achieved level 2 competence.

- ▶ To have regular ultrasound clinics at level 2 for at least two years (at least 500 examinations per year).
- ▶ To be occupied mainly with musculoskeletal ultrasound.
- ▶ To perform (or have knowledge about) specialised musculoskeletal ultrasound examinations
- ▶ To perform advanced US-guided interventional procedures.

competencies to be acquired

- ▶ To accept and manage tertiary referrals from level 1 and 2 practitioners.
- ▶ To perform specialised musculoskeletal ultrasound.
- ▶ To perform all sorts of musculoskeletal US-guided interventions.
- ▶ To conduct substantial research (clinical or fundamental) in the field of musculoskeletal ultrasound.
- ▶ To teach musculoskeletal ultrasound to trainees and practitioners at all levels.
- ▶ To be aware of and to pursue developments in musculoskeletal ultrasound.

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 musculoskeletal ultrasound 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.

Appendix 12: Musculoskeletal Ultrasound Training Competency Assessment Sheet

Trainee: _____		Trainer: _____	
Core Knowledge Base - Level 1			
	Trainer Signature	Date	
·Physics and technology	_____	_____	
·Practical instrumentation / Use of ultrasound controls	_____	_____	
·Normal musculoskeletal anatomy	_____	_____	
·US examination of normal joints and muscles	_____	_____	
Competencies/Skills to be acquired - Level 1			
To be competent to perform/diagnose the following:			
	Trainer Signature	Date	
Shoulder			
·Full-thickness rotator cuff tear	_____	_____	
·Rotator cuff calcifications (different types)	_____	_____	
·Shoulder joint effusion and synovitis	_____	_____	
·Subacromial-subdeltoid bursitis	_____	_____	
·Biceps tendon (tendinopathy, luxation, rupture)	_____	_____	
·Hill-Sachs lesion	_____	_____	
·Acromioclavicular joint pathology	_____	_____	
·(Rheumatoid erosions)	_____	_____	
Elbow			
·Lateral and medial epicondylitis	_____	_____	
·Elbow joint effusion and synovitis	_____	_____	
·(Rheumatoid erosions)	_____	_____	
Wrist and Hand			
·Ganglion cyst	_____	_____	
·Tenosynovitis	_____	_____	
·Tendon rupture	_____	_____	
·Joint effusion and synovitis	_____	_____	
·Rheumatoid erosions	_____	_____	
Common Muscles			
·Large muscle rupture, hematoma	_____	_____	
·Abscess	_____	_____	
·Myositis ossificans	_____	_____	
Hip			
·Hip joint effusion and synovitis	_____	_____	
·Trochanteric bursitis	_____	_____	
·(Rheumatoid erosions)	_____	_____	
Knee			
·Knee joint effusion and synovitis	_____	_____	
·Baker's cyst (and rupture)	_____	_____	
·Patellar ligament tendinopathy	_____	_____	
·Quadriceps tendon rupture	_____	_____	
·Identification of the menisci	_____	_____	
·Large Meniscus cyst	_____	_____	
·Osgood-Schlatter	_____	_____	
·Collateral ligament strain	_____	_____	
·(Rheumatoid erosions)	_____	_____	
Ankle and Foot			
·Joint effusion and synovitis	_____	_____	
·Achilles tendinopathy and rupture	_____	_____	
·Tenosynovitis	_____	_____	
·Fasciitis plantaris	_____	_____	
·(Rheumatoid erosions)	_____	_____	
Other			
·Identification of bone pathology	_____	_____	
·Fluid at prosthesis/osteoarthritis	_____	_____	
·Detection of foreign body	_____	_____	

Appendix : Musculoskeletal Ultrasound Training Competency Assessment Sheet

Trainees: _____		Trainer: _____	
Competencies/Skills to be acquired - Level 2			
To be competent to perform/diagnose the following:			
Trainer Signature	Date	Trainer Signature	Date
Shoulder			
·Partial-thickness rotator cuff tear	_____	_____	_____
·Dynamic examination for impingement	_____	_____	_____
·Ganglion	_____	_____	_____
·Rotatorcuff interval pathology	_____	_____	_____
·Frozen shoulder	_____	_____	_____
·Nerve entrapment	_____	_____	_____
·Identification of ant and post glenoid labrum	_____	_____	_____
·US-guided interventions	_____	_____	_____
Elbow			
·Biceps and triceps tendinopathy and rupture	_____	_____	_____
·Nerve entrapment	_____	_____	_____
·US-guided interventions	_____	_____	_____
Wrist and Hand			
·Carpal tunnel syndrome	_____	_____	_____
·Tendon adhesions	_____	_____	_____
·Ligament and pulley lesions	_____	_____	_____
·Other tumours than ganglion	_____	_____	_____
·US-guided interventions	_____	_____	_____
Ankle and Foot			
·Morton 's neuroma	_____	_____	_____
·Tarsal tunnel syndrome	_____	_____	_____
·Ligament strain	_____	_____	_____
·US-guided interventions	_____	_____	_____
Muscles			
·Small muscle rupture	_____	_____	_____
·Late complication of muscle rupture	_____	_____	_____
·Identification of common muscle tumours	_____	_____	_____
Other	_____	_____	_____
·Withdrawal of foreign body	_____	_____	_____
·Bone pathology (fracture, tumour)	_____	_____	_____
·Doppler examination of tendons, joints, ...	_____	_____	_____
·Entesopathy	_____	_____	_____
·Identification of common nerves	_____	_____	_____
·US-guided interventions	_____	_____	_____