EFSUMB
EUROPEAN FEDERATION OF SOCIETIES FOR ULTRASOUND IN MEDICINE AND BIOLOGY
'Building a European Ultrasound Community'

MINIMUM TRAINING REQUIREMENTS FOR THE PRACTICE OF MEDICAL ULTRASOUND IN EUROPE

Appendix 11: Thoracic Ultrasound

This curriculum is intended for clinicians who perform diagnostic and therapeutic thoracic ultrasound. It includes standards for theoretical knowledge and practical skills. At least level 1 competence should be obtained by anyone performing thoracic scans unsupervised

Level 1

- It is recommended that the trainee should observe 25 thoracic ultrasound examinations and perform (under supervision) at least 100 examinations on normal patients, 50 ultrasound examinations on patients with pleural effusions and 25 thoracocenteses
- A minimum of 200 examinations in total are required to acquire the necessary skills; the end point of the training programme should be judged by an assessment of competencies
- Examinations should encompass the full range of pathological conditions listed below.
- A logbook listing the types of examinations undertaken should be kept.
- Training should be supervised either by someone who has obtained at least Level 2 competence in thoracic ultrasound or by a Level 1 practitioner with at least 2 years' experience of Level 1 practice.
- Trainees should attend an appropriate theoretical course (at least 15 hrs) and should read appropriate textbooks and literature.
- During the course of training the competency assessment sheet should be completed as this will determine in which area(s) the trainee can practise independently.

Knowledge Base

Physics and technology, ultrasound techniques and administration

Approaches to:

- chest wall
- pleural space
- lung (direct intercostal, abdominal)
- mediastinum (suprasternal, right and left parasternal, posterior paravertebral, supraclavicular, subcostal - approaches)

Sectional and ultrasonic anatomy

- right and left hemidiaphragms
- heart
- superior and anterior mediastinum (with great vessels and oesophagus)
- liver and spleen

- chest wall
- supraclavicular region
- rib and intercostal spaces

Pathology in relation to ultrasound

- pleural effusion
- pleural thickening
- pneumothorax
- chest wall abnormalities
- detection of pulmonary lung consolidation (inflammation, atelectasis, embolism, neoplasm)
- paralysed hemidiaphragm
- pericardial effusion

Competencies to be Acquired

To be able to:

- Recognize the normal anatomy of pleura and diaphragm
- Identify the heart, great mediastinum vessels, liver and spleen
- Recognize pleural effusion, including the different echogenic patterns
- Recognize pleural thickening and its differentiation from pleural fluid
- Detection of pulmonary consolidation (inflammation, atelectasis, embolism, neoplasm)
- Estimate the quantity of pleural fluid
- Perform guided thoracocentesis

Level 2

- Practical training should involve at least 1 year of experience at Level 1 with a minimum of two examinations performed per week.
- A further 300 examinations should be undertaken in order to encompass the full range of conditions and procedures listed below.
- Supervision of training should be undertaken by someone who has achieved at least Level 2 competence in thoracic ultrasound, has had at least 2 years' experience at that level.
- A Level 2 practitioner will be able to accept referrals from Level 1 practitioners.

Knowledge Base

Sectional and ultrasonic anatomy

a full understanding of thoracic and diaphragmatic anatomy

Pathology in relation to ultrasound

- more detailed understanding of pleural disease (differentiation of pleural thickening including diagnosis of pleural masses)
- differentiation/characterisation of peripheral pulmonary consolidation, lung abscesses and sequestration
- differentiation of mediastinal masses (solid vs. cystic vs. vascular)

Competencies to be Acquired

To be able to:

- Perform a comprehensive ultrasound examination of the thorax
- Use Doppler ultrasound, including colour and power Doppler in the study of pulmonary , pleural or mediastinal lesions
- knowledge about the use if contrast agents
- Undertake diagnostic interventional procedures including lung, pleural, mediastinal and supraclavicular nodal biopsy
- Perform special therapeutic percutaneous US guided procedures such as catheter drainage of pleural effusion, pleurodesis and instillation of fibrinolytic agents
- Recognise abnormalities which are outside his/her experience and refer to a more experienced ultrasound professional.

Level 3

Training and Practice

- A Level 3 practitioner should spend the majority of their time undertaking thoracic ultrasound or teaching, research and development and will be an 'expert' in this area
- He/she will perform special examinations at the leading edge of ultrasound practice (e.g. endoscopic ultrasound including endobronchial examinations)
- He/she will accept tertiary referrals from Level 1 and 2 practitioners and will perform specialised examinations (e.g. the use of intravascular contrast agents in evaluating malignancy or pulmonary infarction) as well as performing advanced ultrasound-guided invasive procedures.

Maintenance of Skills: All Levels

- Having been assessed as competent to practise there will be a need for continued medical education (CME) and continued professional development and maintenance of practical skills.
- A chest physician specialist will need to continue to perform ultrasound scans throughout the remainder of the training programme. Such further ultrasound practice may be intermittent, but no more than 3 months should elapse without the trainee using his/her scanning skills.

- A medical practitioner scanning at Level 1 should perform at least 100 ultrasound examinations per year and have regular meetings with ultrasound /radiological colleagues

Practitioners should:

- include ultrasound in their ongoing CME
- audit their practice
- participate in multidisciplinary meetings
- participate in basic, advanced or/and postgraduate thoracic ultrasound courses
- keep up to date with relevant literature

'EFSUMB is grateful to Assoc.Prof.Dr.Zeno Spirchez, 3rd Medical Clinic (Clinica Medicala III), Str.Croitorilor 19-21, 400162 Cluj Napoca, Romania; OA Dr. Wolfgang Blank, Klinikum am Steinenberg, Innere Medizin, Steinenbergstraße 31, 72710 Reutlingen, Germany;Prof. Dr. Gebhard Mathis, Internal Practice, Bahnhofstraße 16/2, 6830 Rankweil, Austria and the EFSUMB Education and Professional Standards Committee (2005-2009).

The Minimum Training Recommendations for the Practice of Medical Ultrasound were published under the EFSUMB Newsletter section in the Ultraschall in der Medizin/European Journal of Ultrasound, Volume 30, issue 1 February 2009 pages 90-91/

APPENDIX 11: 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 etc 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		

	Trainer Signature	Date
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/osteosynthesis		
● Detection of foreign body		

APPENDIX 11: MUSCULOSKELETAL ULTRASOUND TRAINING COMPETENCY ASSESSMENT SHEET

Trainee

Trainer

Competencies/Skills to be acquired - Level 2
To be competent to perform/diagnose etc the following:

	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 adherences		
● Ligament and pulley lesions		
● Other tumours than ganglion		
● 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		

	Trainer Signature	Date
Hip		
● Other bursitis than trochanteric		
● Osteoarthritis		
● Identification of ant labrum		
● Identification of iliopsoas tendon		
● Snapping hip		
● Inguinal hernia		
● Groin pain		
● Pathology of the Infant hip		
● US-guided interventions		
Knee		
● Meniscus tear		
● Meniscus cyst		
● Runner´s knee		
● Pathology of small tendons		
● Osteoarthritis		
● Cartilage lesion		
● US-guided interventions		
Ankle and Foot		
● Morton´s neuroma		
● Tarsal tunnel syndrome		
● Ligament strain		
● US-guided interventions		

Appendix 11: THORACIC ULTRASOUND TRAINING COMPENTENCY ASSESSMENT SHEET

Trainee

Core Knowledge Base – Level 1

	Trainer Signature	Date
Physics and technology		
Ultrasound Techniques		
Administration		
Sectional and ultrasonic anatomy		

Competencies/Skills to be acquired Level 1

To be competent to perform/diagnose etc the following:

	Trainer Signature	Date
• Soft tissue chest wall diseases (lymph nodes, hematomas)		
• Rib fracture		
• Pleural effusion (volume estimation)		
• US-guided thoracocentesis		
• Pleural thickening		
• Pneumothorax		
• Subpleural lung consolidation		
• Pericardial effusion		

Competencies/Skills to be acquired at Level 2

To be competent to perform/diagnose etc the following:

Sectional and ultrasonic anatomy

• a full understanding of thoracic and diaphragmatic anatomy		

Pathology in relation to Ultrasound

• more detailed understanding of pleural disease		
• differentiation of peripheral pulmonary lesions		
• differentiation of mediastinal masses		