



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 10: Cranial Ultrasound

This syllabus is designed to include the whole of cranial ultrasound imaging in infants, not just the ultrasound skills needed on a neonatal intensive care unit. It does not include spinal ultrasound imaging.

Level 1: Training and Practice

- Practical training should involve at least one session per week over a period of no less than 3 months, with approximately five scans per session performed by the trainee (under supervision of an experienced practitioner).
- By the end of Level 1 training the trainee should be able to recognise all main pathologies that need urgent assessment on a neonatal intensive care unit.
- Different trainees will acquire the necessary skills at different rates, and the end point of the training program should be judged by assessment of competencies, rather than by numbers of scans performed alone. As a guide, a minimum of 200 scans should be undertaken if this is the first practical training module undertaken. For those who are already competent at ultrasound in other body areas a reduced number of scans may be needed to achieve competency.
- Examinations should encompass all pathological conditions listed below.
- A logbook listing the types of examinations undertaken should be kept.
- An additional portfolio containing an illustrated description of 20 cases with which the trainee has been personally involved is a useful record of performance and achievement and a useful educational aid.
- Training should be supervised either by a practitioner who has obtained at least Level 2 competence in cranial ultrasound, or by a Level 1 practitioner with at least 2 years' experience of Level 1 practice.
- Trainees should attend an appropriate theoretical course 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 or areas the trainee can practise independently

Level 1: Knowledge Base

- Physics and technology, ultrasound techniques and administration (see Appendix 1)
- Issues of parental information and consent.
- Sectional and ultrasonic anatomy of the brain:
 - Sagittal anatomy



EFSUMB

EUROPEAN FEDERATION OF SOCIETIES FOR ULTRASOUND IN MEDICINE AND BIOLOGY

'Building a European Ultrasound Community'

- coronal anatomy
- basic transfontanal and near-field scanning
- Pathology in relation to ultrasound:
 - intracranial haemorrhage
 - hypoxic ischaemic change (in full term and premature infants)
 - ventricular dilatation
 - common congenital malformations

-

Level 1: Competencies to be acquired

To be able to:

- perform a thorough ultrasound examination of the brain in different scan planes
- recognise normal anatomy, common normal variants and varying appearances of normal anatomy with gestational age
- recognise varying presentations of pathological processes with gestational and post-natal age
- measure ventricular size and assess variation from normality
- assess obstructive hydrocephalus and monitor progression and describe intracranial haemorrhage and assess its extent
- recognise common congenital malformations and refer for appropriate further investigation
- recognise when other imaging modalities are more appropriate than ultrasound
- recognise abnormalities which need referral for scanning by a more experienced practitioner and/ or further investigation

To be able to use ultrasound in the assessment of patients presenting with:

- prematurity
- fits/apnoea/collapse
- meningitis
- hydrocephalus
- asphyxia (full term and premature)
- other congenital abnormalities

Level 2: Training and Practice

- Practical training should involve at least 1 year of experience at Level 1 with a minimum of one session per week.
- A significant number of further examinations should have been undertaken sufficient to encompass the full range of conditions and procedures referred to below.
- A logbook of all examinations undertaken should be kept.



EFSUMB

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

- Supervision of training should be by a practitioner who has achieved at least Level 2 competence in cranial ultrasound, has had at least 2 years' experience at that level, and who would normally be of a consultant or independent practitioner status.
- A Level 2 practitioner will be able to accept referrals from Level 1 practitioners.

Level 2: Knowledge Base

- Sectional and ultrasonic anatomy
- Cerebellum and posterior fossa structures
- the basic use of Doppler ultrasound, including spectral, colour and power Doppler
- further applications of cranial ultrasound
- use of trans-axial ultrasound
- assessment of cerebral perfusion
- Pathology in relation to ultrasound
- an understanding of the role of ultrasound in the context of cerebral asphyxia, abnormal head circumference, congenital abnormalities, non accidental injury and systemic disease

Level 2: Competencies to be acquired

- Competencies will have been gained during training for Level 1 practice, and then refined during a period of practice.
- Vascular studies in asphyxia.
- Role of ultrasound in the assessment of abnormal head circumference
- Recognition of most identifiable congenital brain malformations.
- Further assessment of antenatally suspected anomalies.
- Identification and location of surface collections.
- Appearances of non-accidental injury and the limitations of ultrasound assessment.
- Intra-operative ultrasound as appropriate.
- Infants with systemic disease (e.g., post-operative or paediatric intensive care).
- Competency in reporting results and communicating them to the clinical teams in an appropriate way

Level 3: Training and Practice

- A Level 3 practitioner is likely to spend a significant proportion of his or her time undertaking cranial ultrasound, teaching, research and development and will be an 'expert' in this area.
- Practical training should involve at least 2 years of experience at Level 2.
- He or she will accept tertiary referrals from Level 1 and " practitioners and will perform specialised examinations.

Maintenance of skills: All Levels



EFSUMB

EUROPEAN FEDERATION OF SOCIETIES FOR ULTRASOUND IN MEDICINE AND BIOLOGY

'Building a European Ultrasound Community'

- Having been assessed as competent to practice at Level 1, there will be a need for maintenance of practical skills, by continuing to perform regular ultrasound and update skills. Such further ultrasound practice may be intermittent, but no more that 3 months should elapse without the trainee using his ultrasound skills and sufficient examinations should be performed per year to maintain competency.
- In independent practice, a medical practitioner scanning at level 1 should continue to perform at least 100 examinations per year should have regular meetings with imaging colleagues and should have a designated ultrasound practitioner of Level 2 experience or above designated as their mentor.
- Practitioners should:
 - Include ultrasound in their ongoing CME
 - Audit their practice
 - Participate in multidisciplinary meetings
 - Keep up to date with relevant literature

EFSUMB is grateful to the Royal College of Radiologists, London, for their permission to adapt their 'Ultrasound Training Recommendations for Medical and Surgical Specialties' document published in 2005. Adaptations of these have been undertaken by members of the EFSUMB Education and Professional Standards committee for use elsewhere in Europe.

Whilst every attempt has been made to provide accurate and useful information, neither EFSUMB nor members of EFSUMB nor other persons or institutions contributing to the formation of these guidelines make any warranty, express or implied, with regard to accuracy, omissions and usefulness of the information herein. Furthermore, the same parties do not assume liability with respect to the use, or subsequent damages resulting from the use of the information contained in these guidelines.

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 88-90.

APPENDIX 10: Cranial Ultrasound in Infants Training Competency Assessment Sheet

Trainee

Core Knowledge Base – Level 1

Physics and technology
 Practical instrumentation/use of ultrasound controls
 Cranial ultrasound techniques

Competencies/Skills to be acquired Level 1

To be competent to perform/diagnose etc the following:

- transfontanelle ultrasound examination in different scan planes
- normal anatomy, common normal variants and varying appearances of normal anatomy with gestational age
- varying presentations of pathological processes with gestational and post-natal age
- periventricular leukomalacia (PVL) and full term asphyxia (FTA)
- ventricular size and assess variation from normality
- obstructive hydrocephalus and monitor progression
- intracranial haemorrhage, its extent and complications
- common congenital malformations including posterior fossa malformations

Core Knowledge Base - Level 2

Sectional and ultrasonic anatomy
 – the basic use of doppler ultrasound including spectral, colour and power doppler
 – further applications of cranial ultrasound
 – use of trans-axial ultrasound
 – posterior fossa structures
 – assessment of cerebral perfusion

Competencies/Skills to be Acquired - Level 2

- vascular studies in asphyxia
- role of ultrasound in the assessment of abnormal head circumference
- recognition of most identifiable congenital brain malformations
- further assessment of antenatally suspected anomalies

Trainer

Administration and image recording
 Sectional and ultrasonic anatomy
 Cranial pathology in relation to ultrasound

- use ultrasound in the assessment of patients presenting with:
 - prematurity
 - fits/apnoea/collapse
 - meningitis
 - hydrocephalus
 - asphyxia (full term and premature)
 - other congenital abnormalities
- recognise when other imaging modalities are more appropriate than ultrasound
- recognise abnormalities which need referral for scanning experienced practitioner and/or further investigations

Pathology in relation to ultrasound
 – an understanding of the role of ultrasound in the context of cerebral asphyxia, abnormal head circumference, congenital abnormalities, non-accidental injury and systemic disease

- identification and location of surface collections
- appearances of non-accidental injury and the limitations of ultrasound assessment
- intra-operative ultrasound as appropriate
- infants with systemic disease (e.g. Post-operative or paediatric intensive care)
- competency in reporting results and communicating them to the clinical team in an appropriate way

Trainer Signature **Date**

Trainer Signature **Date**

Trainer Signature **Date**

Trainer Signature **Date**

