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EUROPEAN FEDERATION OF SOCIETIES FOR ULTRASOUND IN MEDICINE AND BIOLOGY
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MINIMUM TRAINING REQUIREMENTS FOR THE PRACTICE OF MEDICAL ULTRASOUND IN EUROPE

Appendix 6: Nephro-Urological Ultrasound

This curriculum is intended for clinicians who perform diagnostic nephrological and/or urological ultrasound. It includes standard for theoretical knowledge and practical skills. At least level 1 competence should be obtained by anyone performing nephro-urological scans unsupervised.

Level 1

- Practical training should involve at least one ultrasound clinic per week over a period of 3–6 months, with approximately 5–10 examinations performed by the trainee (under supervision) per clinic session.
- A minimum of 250 examinations should be undertaken. However, different trainees will acquire the necessary skills at different rates, and 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 log book listing the types of examinations undertaken should be kept.
- Training should usually be supervised by a practitioner who has obtained at least level 2 competence in nephro-urological ultrasound. In certain circumstances it may be appropriate to delegate some of this supervision to an experienced level 1 practitioner with at least 2 years of regular 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 2)
- Sectional and ultrasonic anatomy
 - kidneys
 - ureters
 - other retro-peritoneal structures (adrenals, aorta, i.v.c.)
 - bladder
 - seminal vesicles
 - prostate
 - scrotal contents
 - other pelvic structures (uterus, ovaries, lymph nodes, vessels, bowel)



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- Pathology in relation to ultrasound
 - kidneys: congenital anomalies, cysts, tumours (benign and malignant), stones, collecting system dilatation, renal and peri-renal abscesses, trauma, diffuse renal diseases, acute and chronic renal failure
 - ureters: dilatation, obstruction
 - bladder: tumours, diverticula, wall thickening, calculi, volume estimation
 - prostate: zonal anatomy, infection, hyperplasia, tumours
 - scrotal contents: testicular tumours, cysts, torsion, hydrocele, inflammatory problems, trauma

Level 1 Competencies to be Acquired

- Kidneys
 - To be able to:
 - perform a thorough ultrasound examination of the kidneys in different planes
 - recognise normal renal ultrasonic anatomy and common normal variants
 - measure renal length and assess variation from normality
 - recognise and assess the degree of collecting system dilatation
 - recognise and diagnose simple cysts
 - recognise complex cysts and refer for appropriate further investigation
 - recognise renal tumours and refer for appropriate further investigation
 - recognise diffuse renal medical diseases associated with renal dysfunction
 - recognise and diagnose renal stones
 - recognise peri-renal abnormalities and refer for appropriate further investigation
 - recognise abnormalities which need referral for scanning by a more experienced ultrasonologist and/or further investigation
- Bladder
 - To be able to:
 - perform a thorough ultrasound examination of the bladder in different planes
 - recognise normal ultrasonic anatomy of the bladder and common normal variants
 - measure bladder volume
 - recognise and diagnose bladder diverticula
 - recognise and assess bladder tumours
 - recognise bladder calculi
 - use colour Doppler to assess ureteric jets
 - recognise abnormalities which need referral to a more experienced ultrasonologist and/or for further investigation
- Scrotum (for Urologists)
 - To be able to:



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- perform a thorough ultrasound examination of the scrotal contents in different planes
 - recognise normal ultrasonic anatomy of the testes and epididymi and common normal variants
 - recognise and diagnose epididymal cysts
 - recognise and diagnose varicoceles
 - use doppler to help differentiate torsion/inflammatory problems
 - recognise and assess intra-scrotal and intra-testicular calcifications
 - recognise and assess testicular tumours
 - recognise inflammatory changes in testes and epididymes
 - recognise abnormalities which need referral to a more experienced ultrasonologist and/or for further investigation
- Prostate (for Urologists)
To be able to:
 - recognise normal ultrasonic anatomy and common normal variants
 - perform trans-rectal ultrasound
 - measure prostatic volume
 - identify abnormal focal lesions
 - perform a standardised technique of trans-rectal prostatic biopsy (optional depending on clinical practice/national guidelines)
 - recognise abnormalities which need referral to a more experienced ultrasonologist and/or for further investigation
- Other
 - To be able to recognise and, where appropriate, refer for further investigation:
 - normal aorta and aortic aneurysm
 - normal liver and liver masses
 - normal uterus and ovaries and gynaecological masses
- To be able to use ultrasound in the assessment of patients presenting with:
 - haematuria
 - loin pain/renal colic
 - loin mass
 - renal failure
 - hypertension
 - abdominal trauma
 - lower urinary tract symptoms
 - recurrent urinary tract infections



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- supra-pubic mass
- palpable masses in the scrotum
- scrotal pain

Level 2 Training and Practice

- Practical training should involve at least 1 year of experience at level 1 with a minimum of one ultrasound clinic per week.
- A further 600 examinations should have been undertaken in order to encompass the full range of conditions and procedures referred to below.
- A log book listing all examinations undertaken should be kept.
- Supervision of training should be undertaken by someone who has achieved at least Level 2 competence in urological ultrasound and has had at least 2 years experience at that Level.
- A Level 2 practitioner will be able to accept referrals from Level 1 practitioners.

Level 2 Knowledge Base

- Physics and technology
 - in-depth knowledge and understanding of the physics of ultrasound
 - in-depth knowledge and understanding of the technology of ultrasound equipment
- Ultrasound techniques
 - the advanced use of Doppler ultrasound, including spectral, colour and power Doppler
 - the use of ultrasound for guiding interventional procedures
 - further applications of trans-abdominal ultrasound
 - further application of endo-cavity ultrasound (e.g., trans-vaginal ultrasound intra-operative ultrasound)
- Sectional and ultrasonic anatomy
 - the normal renal and pelvic vasculature, including an understanding of the Doppler signals obtained from these vessels
 - more detailed knowledge of structures outside the urinary tract in the abdomen and pelvis
 - ultrasound anatomy of the penis and female genital organs (for Urologists).

Level 2 Competencies to be Acquired

- Competencies will have been gained during training for Level 1 practice, and then refined during a period of clinical practice.
- Kidneys, bladder, prostate, scrotal contents
To be able to:
 - recognise all pathology affecting the urinary tract and provide an accurate diagnosis in almost all cases



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- recognise abnormalities which are outside his/her experience and refer on appropriately to a more experienced ultrasound professional
- perform ultrasound-guided invasive procedures, including cyst aspiration, abscess drainage, renal biopsy, percutaneous nephrostomy, supra-pubic bladder catheter insertion and trans rectal prostate biopsy
- perform Doppler ultrasound studies relevant to the urinary tract
- recognise abnormalities elsewhere in the abdomen and pelvis which need referral for scanning by another ultrasonologist and/or further investigation
-

Level 3 Training and Practice

- A Level 3 practitioner is likely to spend the majority of their time undertaking nephro-urological ultrasound, teaching, research and development and will be an 'expert' in this area.
- He/she will have spent a continuous period of specialist training in nephro-urological ultrasound.
- He/she will perform specialised examinations at the leading edge of ultrasound practice.
- He/she will accept tertiary referrals from Level 1 and Level 2
- practitioners and will perform specialised examinations (e.g., the use of intravascular ultrasound agents in evaluating possible malignancy) 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 (CPD) and maintenance of practical skills.
- A trainee will need to continue to perform ultrasound scans throughout the remainder of their training programme. Such further ultrasound practice may be intermittent, but no more than 3 months should elapse without trainees using their ultrasound skills, and at least 100 examinations should be performed per year.
- A medical practitioner performing Level 1 ultrasound should continue to perform at least 250 ultrasound examinations per year on a regular basis.
- Practitioners should:
 - include ultrasound in their ongoing CME
 - audit their practice
 - participate in multidisciplinary meetings
 - keep up to date with relevant literature
 - 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



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2005. Adaptations of these have been undertaken by members of the EFSUMB Education and Professional Standards committee for use elsewhere in Europe.

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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 27, issue 1 February 2006 page 79-105.

APPENDIX 6: NEPHRO-UROLOGICAL ULTRASOUND TRAINING COMPETENCY ASSESSMENT SHEET

Trainee

Trainer

Core knowledge base - Level 1

Trainer Signature Date

Trainer Signature Date

- Physics and technology
- Practical instrumentation/use of ultrasound controls
- Ultrasound techniques

- Administration
- Sectional and ultrasonic anatomy
- Pathology in relation to ultrasound

Competencies/skills to be acquired Level 1

To be competent to perform/diagnose the following:

To be competent to perform/diagnose the following:

Trainer Signature Date

Trainer Signature Date

Kidneys

- ultrasound examination in different planes
- ultrasonic anatomy and common normal variants
- renal length and variation from normality
- collecting system dilatation
- simple cysts
- complex cysts
- tumours
- stones
- renal parenchymal disease
- reno-vascular hypertension
- peri-renal abnormalities

Bladder

- ultrasound examination in different planes
- ultrasonic anatomy and common normal variants
- bladder volume
- diverticula
- tumours
- calculi
- use colour Doppler to assess ureteric jets

Prostate (for Urologists)

- ultrasonic anatomy and common normal variants
- trans-rectal ultrasound
- prostatic volume
- abnormal focal lesions
- trans-rectal prostatic biopsy
(optional/depending on national guidelines)

Scrotum (for Urologists)

- ultrasound examination in different planes
- ultrasonic anatomy and common normal variants
- epididymal cysts
- varicoceles
- intra-scrotal and intra-testicular calcifications
- tumours
- inflammatory changes in testes and epididymides
- use Doppler to help differentiate torsion/inflammatory problems

General

Use ultrasound in the assessment of patients presenting with:

- haematuria
- loin pain/renal colic
- loin mass
- renal failure
- lower urinary tract symptoms
- recurrent urinary tract infection
- supra-pubic mass
- palpable scrotal masses
- scrotal pain
- normal aorta and aortic aneurysm
- normal liver and liver masses
- normal uterus and ovaries and gynaecological masses

- know when to refer to a more expert ultrasonologist

APPENDIX 6: NEPHRO-UROLOGICAL ULTRASOUND TRAINING COMPETENCY ASSESSMENT SHEET

Trainee Trainer

Competencies/skills to be acquired Level 2

To be competent to perform/diagnose the following:

	Trainer Signature	Date
Recognise all urinary tract pathology	_____	_____
Perform:		
• cyst aspiration	_____	_____
• abscess drainage	_____	_____
• renal biopsy	_____	_____
• nephrostomy	_____	_____
• suprapubic bladder catheter insertion	_____	_____
• trans-rectal prostate biopsy	_____	_____
• perform Doppler studies	_____	_____
• recognise abnormalities elsewhere in the abdomen/pelvis	_____	_____