

Recommendations for education and training of specialist paediatric sonographers

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Introduction

In the United Kingdom there is no formal training pathway in place for the progression of a qualified sonographer to advance their practice in paediatric ultrasound. Globally it is also apparent that there is a lack of specialist paediatric ultrasound training.¹ This document sets out recommendations that aim to standardise paediatric ultrasound education and enable sonographers to practise safely, in the absence of an accredited course. The recommendations will provide protection to children attending for ultrasound scans, by evidencing that the sonographer has undertaken appropriate further study and has been assessed as clinically competent by the paediatric imaging lead to undertake specific paediatric examinations within their scope of practice. The paediatric sonographer is expected to follow the guidance given in the professional practice guidelines published by the Society of Radiographers (SoR) and the British Medical Ultrasound Society (BMUS),² which is updated annually and other relevant guidance. All sonographers should have adequate professional indemnity insurance to cover their work; this will need to be in place prior to starting the training. Sonographers who do not have a statutory registration should consider registering as a sonographer with the [Register of Clinical Technologists](#).

This document provides recommendations for training, knowledge requirements and assessment to evaluate the ability of the learner to do what is clinically required safely and competently.

Criteria for commencing training

A sonographer should meet the following criteria before they begin specialist paediatric ultrasound training:

1. Qualified sonographer with a post-graduate diploma and preferably an MSc
2. At least two years' general abdominal and gynaecology ultrasound experience
3. Current obstetric experience within the last five years, or the option to incorporate a fetal medicine or obstetric ultrasound placement into the training programme
4. A named consultant radiologist or experienced paediatric sonographer as a supervisor for the duration of the training
5. An opportunity to attend and present at multi-disciplinary team (MDT) meetings, to understand the role of ultrasound in the patient pathway as required by the various clinical specialities represented

Recommendations for training

It is recommended that the following requirements are met by the learner and the department supporting the learner:

1. *Minimum six months full-time (or twelve months part-time) in-house training, with regular formative assessment and feedback, culminating in a formal clinical assessment and viva voce*
2. *Ultrasound reports reviewed, discussed and signed off by a consultant radiologist or experienced paediatric sonographer while the sonographer is in training. While learning, the sonographer should not be working unsupervised until they have been 'signed off' as competent.*
3. *Complete a portfolio, assessed by the supervisor and one other professional, demonstrating a range of clinical experience (see portfolio section)*
4. *Initially observe five ultrasound examinations of a specific anatomical area*
5. *Complete a minimum of five ultrasound examinations of each specific anatomical area under direct supervision*
6. *Undertake a minimum of twenty-five unsupervised cases of common anatomical areas, or ten cases of less common areas. These should ideally include a range of pathology in addition to normal cases. The numbers are a guide and can be adapted by each institution in which the training is undertaken. Clinical competency is of greater importance than minimum numbers.*
7. *Discuss infrequent cases that are rarely seen. The learner needs to be familiar with all relevant areas for training set out in their portfolio.*
8. *Use template reporting for consistency, if appropriate*
9. *Present two interesting cases from different anatomical areas to colleagues within the team*

Knowledge

In addition to meeting the Skills for Health Occupational Standard [CI.C.2019 Perform, interpret and report on ultrasound examinations](#)³ learners should have:

1. An understanding of how paediatric referrals are vetted and prioritised
2. Detailed knowledge of different patient preparation requirements
3. A critical understanding of local and national guidelines relating to the areas to be included within the training
4. A thorough understanding of the consent process and Gillick competence for paediatric patients and the medico-legal implications of the consent process
5. A comprehensive knowledge of normal anatomy, anatomical variants and a wide range of paediatric and neonatal pathology, and an ability to demonstrate the understanding necessary to differentiate between paediatric and adult anatomy and ultrasound appearances
6. Appropriate understanding of the role of Doppler and other ultrasound techniques, as appropriate for the organs or structures being examined
7. In-depth knowledge of both acquired and congenital paediatric diseases
8. A thorough understanding of the role of ultrasound in the patient pathway across a wide range of clinical specialities
9. Detailed knowledge of current report writing guidance and how this applies to paediatric ultrasound cases
10. A critical understanding of how to communicate sensitively with a wide range of patients, parents, carers and guardians to provide person-centred care
11. Knowledge of how and why the department undertakes quality assurance and audit
12. The knowledge and understanding of how to adapt the equipment settings for paediatric patients, including creating a range of predetermined settings that optimise image quality and ensure safe practice
13. The understanding of how to adapt the ultrasound environment to cater for different types of examination and different ages of children
14. The understanding and ability to adhere to infection prevention and control policies, maintaining and cleaning ultrasound equipment

Clinical portfolio

It is recommended that learners develop a portfolio of evidence to demonstrate their on-going progress. Evidence within the portfolio could be used to support the discussion within the viva voce assessment on completion of the training period. Contents should include the following:

1. A log of all cases undertaken during training, to include a minimum of twenty-five unassisted ultrasound examinations in each anatomical area
 2. A continuous record of interesting cases performed during training *This could include the clinical history, ultrasound diagnosis, or differential diagnoses, and where possible, confirmed diagnosis from further imaging or histology.*
 3. Areas of ultrasound according to the requirements of the institution *Each individual hospital, NHS Trust or Health Board will need to determine the requirements for their local needs, but areas may typically include:*
 - a. *General abdominal*
 - b. *Paediatric oncology*
 - c. *Gynaecology*
 - d. *Paediatric renal*
 - e. *Neonatal renal*
 - f. *Musculoskeletal, including spine, hips and joint effusions*
 - g. *Soft tissue, including scrotum, lumps and bumps*
 - h. *Vascular ultrasound such as deep vein thrombosis upper and lower limb line insertion*
 - i. *Head and neck*
 - j. *Emergency gastrointestinal ultrasound including appendicitis, pyloric stenosis, intussusception and collections*
 4. Two 1000-word interesting case studies covering different anatomical areas
 5. Monthly or bimonthly clinical audit of cases, including both image and report quality, following recommended audit processes such as those referred to in the SoR and BMUS [Guidelines for Professional Ultrasound Practice](#)²
 6. Feedback from the viva voce assessment, which can include discussion around the topics presented in the case studies, the clinical assessments and the audit of clinical findings
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Formative monitoring

Formative clinical assessments should be undertaken every two months to review clinical learning needs and provide constructive feedback. Action plans should be developed in response to the feedback, and these can be included within the clinical portfolio.

Summative clinical assessment

The training programme should culminate in two ultrasound lists (minimum of five patients per list), assessed by two radiologists and/or experienced paediatric sonographers. The learner should be assessed over a range of anatomical areas that are required by the individual hospital, NHS Trust or Health Board in which the training is undertaken.

The learner must meet the assessment criteria (Appendix 1) to pass the summative clinical assessment. Competency assessment should include the following:

1. Machine technicality, including selecting the appropriate probe, optimising equipment settings and labelling images
2. Correct use of machine settings for the anatomy and pathology imaged, including Doppler imaging
3. Knowledge, understanding and implementation of appropriate infection prevention and control
4. Documenting the ultrasound findings accurately and answering the clinical question in a written report
5. Summarising the report with a conclusion
6. Suggesting further imaging, correct referral and follow-up where appropriate
7. Appropriate understanding and knowledge of how to deal with incidental findings
8. Appropriate use of the ALERT system
9. Understanding when it is necessary to ask for assistance
10. Understanding the limitations of the examination
11. Appropriate communication with the child, parent and carers and other healthcare professionals

Programme competency will be achieved when:

1. A list of the locally required ultrasound examinations successfully meet all relevant criteria, following assessment by a paediatric radiologist and/or experienced paediatric sonographer
2. The logbook of cases is complete
3. Two case studies have been presented and discussed
4. Clinical competency sign-off is agreed by two assessors

Post-completion

On completion of the training, it is important that the sonographer is supported and given time to continue their learning and professional development. Advice can be found in the document [Preceptorship and capability development framework for sonographers](#).⁴ Sonographers should consider providing supporting evidence in a portfolio, such as:

1. Continuing logbook of complex cases to follow up, discuss at MDT meetings and present to the department
2. Random audit of images and reports from different areas of practice, chosen by the assessor, using the [BMUS peer review audit tool](#)⁵ and performed every six months
3. Evidence that the SoR and BMUS Guidelines for Professional Ultrasound Practice sections 5.3 and 6.3² are being followed
4. Evidence of regular attendance/chairing of MDT meetings and interesting case sessions
5. Evidence of active participation in an internal journal club or the setting up of one if not provided
6. Additional continuing professional development (CPD) evidence as appropriate
7. Annual appraisal to include paediatric CPD requirements and development

References:

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Appendix 1. Clinical competency assessment form

Name of sonographer		
Date		
Area of examination		
Name of examiner		
	Criteria met (1)	Criteria not met (0)
Pre examination		
Checked that the appropriate examination was requested		
Room setup		
Appropriate machine settings and probes selected		
Hand hygiene followed		
Introductions made		
Three forms of ID checked		
Patient history checked		
Previous imaging correlated		
Referral is correlated with patient symptoms		
Examination is explained to patient and/or parents/carers to gain informed consent		
During the examination		
Adequate distraction resources available and utilised if appropriate		
Appropriate communication is maintained with all parties throughout the examination		
Correct anatomy imaged in line with local protocols		
Images correctly labelled and correct number of images stored according to local protocols		
Pathology identified and imaged accurately		

Appendix 1. Clinical competency assessment form: continued

Correct measurements taken		
Accurate calliper placement for required measurement		
Post examination		
Examination time appropriate for the patient and list undertaking		
Results clearly explained to patient and/or parents/carers		
Exam aftercare; probe and machine cleaning, couch cleaning		
Accurate report written and prepared for assessor verification		
Correct referral or follow-up information given to patient and documented in the report		
Viva voce discussion		
Confident discussion of the cases, images and reports		
Ability to discuss equipment settings		
Understanding of any limitations to the examinations		
Discuss the onward referral and likely management of the cases		

Appendix 1. Clinical competency assessment form: continued

Viva voce post assessment – guidance for examiners

Following the examinations, a question-and-answer session should take place for the examiners and learner to discuss the assessments. The learner should answer questions on the examination(s) performed. The examiners should ask the learner to critique or discuss some or all of the following:

- a. Critique the examination performed
- b. Critique the ultrasound images produced and the report
- c. Describe any changes that could have been made: what could have been done differently or could be done differently next time?
- d. Discuss the differential diagnoses
- e. Discuss different patient pathways, how to request further imaging and methods of follow-up to further aid clinicians
- f. Describe which examinations warrant the use of an ALERT system
- g. Discuss how the learner would overcome challenging situations and communicate with different patients

Pass (The learner has reached the standards required by the training programme)

Fail (The learner has not reached the standards expected by the training programme)

Comments and areas for improvement:

Signed Examiner 1

Signed Examiner 2

Signedsonographer assessed

Appendix 2. Quality Standard for Imaging

This guidance relates to sections XR-107, XR-108, XR-204, XR-209, XR-505, US-801, US-802 and US-804 of the [Quality Standard for Imaging](#).

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