Centre for Ultrasound Studies
(CUS)

SHORT COURSE IN BASIC 3rd TRIMESTER PREGNANCY GROWTH ULTRASOUND

Accredited by

College of Radiographers

AECC is an Associate College of Bournemouth University

CONTENTS:

INTRODUCTION:

The advancement of ultrasound in obstetrics has revolutionised antenatal care in the United Kingdom and all pregnant women are offered routine ultrasound examinations at 11-12 week stage for nuchal thickness (NT) measurement for for Downs Syndrome screening and at 18-20 week stage for fetal anomalies. Some pregnant women will also be offered a scan later in pregnancy to assess and monitor fetal growth highlighted by the previous history or during their antenatal care by midwives or obstetricians. Ultrasound examination provides valuable information about fetal wellbeing. The measurement of fetal biometry, i.e. head circumference (HC) and abdominal circumference (AC) measurements and liquor volume can highlight signs of poor fetal growth and fetal compromise and prompt timely intervention which is known to improve outcomes. Midwife lead 3rd Trimester ultrasound pregnancy growth service has following advantages:

- Early diagnosis of later pregnancy growth problems
- Enhanced management of pregnancy with confirmatio of well being and excludion of significant growth restriciton
- Ability to keep low risk women within a midwifery lead pathway

RATIONALE FOR THE COURSE:

It is recognised that both mothers and midwifery staff benefit from providing holistic healthcare for pregnant women. Currently, in many institutions, women will be seen in an Obstetric Assessment Unit when concerns arise about her or her baby's well being. However, identification of growth concerns will usually mean referral in to an Obstetric lead clinic and ultrasound measurements of fetal growth within the Obstetric ultrasound department. Upskilling Obstetric Assessment Unit staff to provide fetal biometry scanning and assessment of liquor volume allows a comprehensive assessment of fetal well being in a single visit. This will improve the women's experience and also increase job satisfaction for staff.

In order for them to utilise ultrasound safely they must demonstrate knowledge, understanding and focused competency in the accurate prediction of growth, well being and liquor volume in late pregnancy. The Midwives will

need a sound knowledge of ultrasound anatomy, technique and ultrasound machine controls. in producing relevant and optimum ultrasound images for safe and competent ultrasound practice.

SHORT COURSE IN BASIC 3rd TRIMESTER PREGNANCY GROWTH ULTRASOUND

Programme Name (Title):	Focused Basic 3rd Trimester Pregnancy Ultrasound Course
Primary Purpose:	To train midwives in the safe and competent use of diagnostic ultrasound for fetal biometry and liquor volume in late pregnancy
Secondary Purpose:	To provide relevant and focused ultrasound competency in the assessment of fetal growth in late pregnancy to enhance clinical decision making around fetal well being
Final Award:	Certification of ultrasound competency in late pregnancy fetal biometry and liquor volume
Awarding Institution:	AECC
Teaching Institution:	AECC
Programme Accreditation:	College of Radiographers

COURSE LOGISTICS:

The course is in three stages:

Stage 1: One day seminar

Stage 2: Supervised ultrasound training (up to 6 months)

Stage 3: Competency assessment

Classroom lectures are designed to highlight 3rd Trimester ultrasound anatomy, fetal biometry and liquor volume. Midwives will also be made aware of common related growth abnormalities that may exist and the ability to refer these women to second and higher opinion. Emphasis will be on the knowledge and understanding of the available ultrasound techniques in the visualisation of 3rd Trimester pregnancy ultrasound applications in a clinical setting.

COURSE DESIGN

The course is designed by the teaching faculty of the Centre for Ultrasound Studies (CUS), Bournemouth and Dr. Amara Sohail (Consultant Obstetrician and Gynaecologist, Basingstoke & North Hampshire Hospital Trust), Dr. Padma Eedarapali (Consultant Obstetrician and Gynaecologist, Bournemouth Hospital) and Dr. Alyson O'Donnell (Clinical Director for Maternity and Young People, the Wessex Strategic Clinical Network).

The course is suitable for hospital lead fetal growth assessment units in line with the best practice guidelines. The course syllabus reflects the essential requirements of these organisations in providing accredited ultrasound training for safe practice. In consideration of this remit the teaching faculty draw upon their experience of running CASE accredited MSc ultrasound courses.

COURSE STRUCTURE:

The course is delivered in three stages:

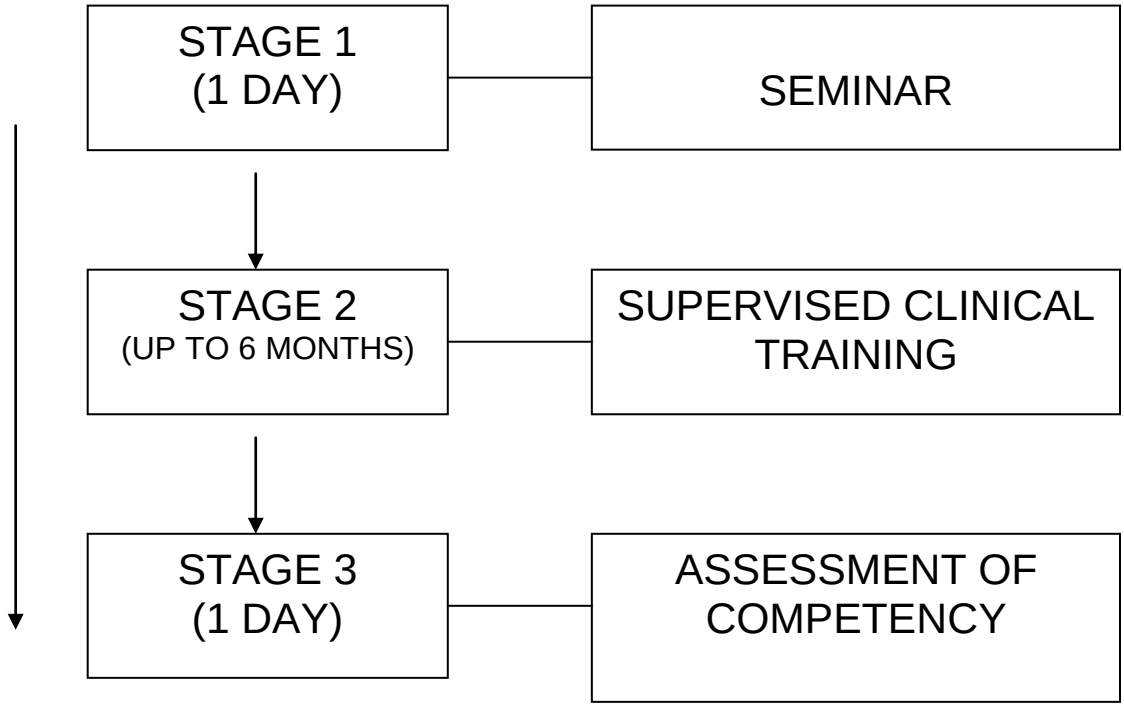
- Stage 1 lays down the foundation of ultrasound imaging and seeks to engage students in the safe application of ultrasound imaging in 3rd Trimester pregnancy for measurement of fetal biometry and liquor volume.

- Stage 2 is the continuing ultrasound training under the supervision of a competent practice educator, approved by CUS. Established growth assessment unit midwives are expected to sign a clinical agreement form for the completion of supervised ultrasound training stipulated in Stage 2 document.

- Stage 3 addresses the students "fitness to practice" by undergoing an assessment of competency in 3rd Trimester dating and liquor volume ultrasound.

On successful completion of Stage 2, midwives will be able to present for ultrasound competency assessment according to the guidelines set in Stage 3. The assessment of ultrasound competency will take place at the designated established ultrasound clinics.

COURSE FLOW DIAGRAM - STAGES IN TRAINING



SHORT COURSE IN BASIC 3rd TRIMESTER PREGNANCY GROWTH ULTRASOUND

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AIMS

To acquire and apply obstetric ultrasound knowledge and skills in safe and competent practice in 3rd trimester pregnancy

The aims of this course are to:

- develop knowledge and understanding of 3rd trimester pregnancy ultrasound
- develop knowledge and understanding of the acquisition, recording and retrieval of 3rd trimester pregnancy ultrasound images for purposes of assessing fetal growth and measurement of liquor volume;
- develop competent clinical and reasoning skills to correctly interpret 3rd trimester pregnancy ultrasound images and to disseminate the findings through accurate report writing skills;
- develop critical appraisals skills to evaluate own practice and limitations, and when to seek a second opinion.
- develop professional and management skills required for 3rd trimester ultrasound pregnancy service
- be aware of quality assurance and safety issues of ultrasound

INTENDED LEARNING OUTCOMES

Having completed this course midwives are expected to:

1. demonstrate systematic knowledge and understanding of 3rd trimester pregnancy ultrasound anatomy
2. demonstrate knowledge and understanding of ultrasound equipment and technique in obtaining optimum images
3. interpret 3rd trimester pregnancy ultrasound images to make accurate decisions in pregnancy management
4. disseminate ultrasound findings in accurate and effective manner to other healthcare professionals
5. demonstrate a critical awareness of professional issues in the management of patients including safe and ethical practice
6. demonstrate quality assurance and safety of ultrasound practice

TEACHING STRATEGY

ILO 1 covered in approach to 3rd trimester pregnancy ultrasound anatomy
ILO 2 covered in the manipulation of ultrasound equipment and technique of obtaining accurate and optimum images
ILO 3 covered in 3rd trimester pregnancy ultrasound anatomy, technique and management of 3rd trimester pregnancy ultrasound clinics
ILO 4 covered in professional issues and management of 3rd trimester pregnancy growth clinics
ILO1, 2, 3, 4 and 5 covered in 3rd trimester pregnancy growth ultrasound clinics/demos/interactive workshops.

TEACHING HOURS (1 day seminar)
4 hours ultrasound science and instrumentation, anatomy, technique, application, report-writing and patient management in 3rd trimester pregnancy ultrasound applications

3.5 hours of interactive 3rd trimester pregnancy ultrasound clinics covering anatomy, technique, imaging, optimisation of machine controls to produce optimum images, report writing and patient management skills; consultant forum providing students with feedback on their performance in the clinic workshops.
1 hour discussion and presentations on assignments/case-studies including aims and objectives, structure of assignments, and assessment criteria.

ASSESSMENT

ILO 1-6 will be assessed through a critical account of case-study in the safe use of 3rd trimester growth pregnancy ultrasound in clinical practice supported by empirical evidence, i.e. ONE long case-study (1250 words each); ONE Science and Instrumentation (S&I) assignment (1500 words) and an OSE (Objective Structured Examination).

INDICATIVE ASSESSMENT

The written long-case-study will demonstrate the student's knowledge and understanding of 3rd trimester growth pregnancy ultrasound anatomy and obtaining accurate and optimum ultrasound images. Midwives will be expected to make accurate interpretations of these images based on available evidence.
The S&I assignment will demonstrate knowledge and understanding in the acquisition, recording and retrieval of ultrasound images; whereas OSE will demonstrate competency in manipulation of ultrasound machine controls in producing optimum images.

Guidelines issued to students:

- Critically evaluate in 3rd trimester pregnancy:
    - the role of ultrasound in visualising ultrasound anatomy
    - the role of ultrasound in the accurate measurements of fetal biometry
    - the management of patients to include communication skills
    - the limitations of ultrasound applications
    - safety and quality assurance issues in safe and ethical practice
    - and support judgements with research and clinical evidence

INDICATIVE CONTENT

- Areas will be 3rd trimester pregnancy
- Communication, counselling and report writing skills
- Medical and Ethical issues to take into consideration consent, chaperone, litigation and complaint procedures
- Professional issues (including safety of patient, clinical governance, confidentiality, privacy, Data Protection Act, discrimination, ergonomics of ultrasound equipment and consideration to RSI)
- Management of 3rd trimester pregnancy ultrasound service

LOGISTICS: STAGE 1 (1 DAY SEMINAR)

1. **Number of hours:** In total 7.5 hours of lectures/tutorials/demonstrations and supervised practical workshops.

2. **Demonstrations:** using models/phantoms for demonstration of normal 3rd trimester pregnancy anatomy/technique and generation of optimum ultrasound images.

3. **Practical workshops:** students will be guided in supervised scanning sessions using models/phantoms to highlight anatomy, technique and good practice with practice educators and members of the teaching faculty.

PRACTICAL WORKSHOPS:

Midwives are circulated in workshops for purposes of demonstration of good practice under the supervision of expert tutors. Small group tutorials allow midwives to appreciate cross-sectional normal 3rd trimester ultrasound anatomy on models and 3rd trimester pregnancy phantoms with emphasis on good technique and safe practice. There is also emphasis on report writing skills, importance of second and higher opinion, clinical governance and effective communications skills.

The following ultrasound company provide support for practical workshops:

- Sonosite

TIMETABLE: STAGE 1 SEMINAR
LECTURE PLAN: DAY 1

8.00	Introduction to the Course	Dr. Hussain
8.30	Physics of Ultrasound	Dr. Hussain
9.15	Ultrasound Equipment	Dr. Hussain
9.45	Coffee	
10.15	Basic 3rd trimester Ultrasound: • Normal ultrasound anatomy • Ultrasound findings for growth-retardation (HC/AC Ratio and Oligohydramnios) • Key ultrasound measurements	Dr. Hussain Dr. Wing
12.15	Ultrasound Techniques: • Transbadominal ultrasound • Fetal Biometry measurements • Liquor Volume measurements ***Lectures and demonstrations using healthy volunteers/phantom***	Dr. Hussain Dr. Wing
13.00	Lunch	
14.00	Practical Workshops ***Healthy Volunteers and Phantoms***	Dr. Wing Dr. Eedarapall Dr. Hussain Dr. Wing Dr. Sohail Dr. Dwendi Mr. Foster
16.00	Tea break	
16.20	Ultrasound Quality Assurance/Safety Training protocol Guidelines	Dr.Hussain Dr. Wing
17.30	*Discussion/Feedback*	Faculty

TEACHING FACULTY:

Dr. 'Budgie' Hussain *(Course Leader/Director of Ultrasound Studies, CUS, Bournemouth)*

Dr. Padma Eedarapall (*Course Supervisor*/*Consultant Obstetrician and Gynaecologist, Royal Bournemouth Hospital)*

Dr. Rachna Dwendi (*Consultant Obstetrician and Gynaecologist, Royal Bournemouth Hospital)*

Dr. Trevor Wing *(Specialist in Obstetrics and Gynaecology Ultrasound, Harley Street, London)*

Dr. Amara Sohail (*Consultant Obstetrician and Gynaecologist, Basingstoke & North Hampshire Hospital Trust)*

Mr. Warren Foster (*Superintendent Sonographer, Lymington Hospital, Lymington)*

COURSE SYLLABUS: SEMINAR STAGE 1

1. Introduction	Familiarisation with course contents. Structure of the course and its delivery.
2. Physics	Nature of ultrasound. Propagation of ultrasound through tissues, Ultrasound transducers. Echo instrumentation. Principal of imaging. Storage and display of images.
3. Equipment	Optimisation of ultrasound images. Ultrasound scanners and their applications. Types of transducers. Design and construction. Recording devices and their function. Selection of equipment
4. Quality Assurance	Definition of QA parameters. QA in hospitals. QA tests. Accuracy of scanners.
5. Safety	Evaluation of safety procedure. Safety Issues. Hazards of ultrasound. Safety tests and guidelines. .
6. Ultrasound Techniques	Trans-abdominal scanning. Potential and limitations. Safe practice
7. 3rd Trimester Ultrasound Anatomy	Identification of key fetal biometry landmarks. 3rd trimester pregnancy anatomy. Key fetal gestational age measurements. Liquor volume (largest pool and 4-quadrant pool measurement.
8. Growth Related Abnormality	HC/AC Ratio discrepancies; Oligohydramnios
9. Conduct of Ultrasound Examination	Consent/chaperone, confidentiality, infection control/Effective communication with patients and clients.
10. Organisation and Management of Ultrasound Service	Established and management of growth clinics
11. Training Issues	Clinical training. Supervision. Clinical assessment. Logbooks, case studies and assessment of clinical proficiency.

STAGE 2

SUPERVISED ULTRASOUND TRAINING

STAGE 2 COMPETENCY PROFILE

Students have to complete the following competency profile:

- A record of clinical practice with documented 50 cases

  (a total of 75% to be supervised and 25% unsupervised)
- 5 out of 50 cases should demonstrate growth related abnormality
- Complete 1 case study (1250 words) of growth related abnormality
- Complete 1 assignment in Science and Instrumentation (1500 words)
- Complete an OSE exam

STAGE 3
(COMPETENCY ASSESSMENT)

AIM:

- The assessment of ultrasound competency in the 3rd trimester pregnancy fetal biometry and liquor volume measurements

INTENDED LEARNING OUTCOMES:

Having completed this unit, the midwife is expected to demonstrate:

1. Knowledge and understanding of ultrasound anatomy of the 3rd trimester pregnancy;

2. Competent use of ultrasound equipment and instrumentation to produce optimum diagnostic images of 3rd trimester fetal biometry and liquor volume measurements;

3. Demonstrate the ability to interpret the ultrasound findings and communicate the results accurately and reliably;

4. Demonstrate professional management of patients and communication skills;

5. Show professional responsibility and awareness of scope of practice in line with the published guidelines;

6. Knowledge and understanding of quality assurance and safety issues.

ASSESSMENT PROCEDURE:

1. The learning outcomes (1-2) will be assessed through ONE written case study (fetal biometry) 1250 words.

2. The learning outcomes 2-6 will be assessed in:

- a record of Clinical Practice (50 patients) (Pass/Fail)
- a competency assessment (Pass/Fail);
- a OSE (Objective Structured Examination) in Science and Instrumentation (Pass/fail);

3. The learning outcomes 2 and 6 will be further assessed through the Science and Instrumentation assignment (1500 words)

The student will:

- conduct ultrasound examinations (max of 3 patients) to the satisfaction of the assessor in a clinical situation organised by the practice educator and approved by the course leader;

- demonstrate a satisfactory level of clinical competency in the visualisation of 3rd trimester pregnancy and carry out competent assessment of fetal biometry and liquor volume;

- demonstrate an ability to manipulate machines controls to produce an optimum images;

- demonstrate an ability to take accurate gestational age measurements of the 3rd trimester pregnancy;

- demonstrate an ability to take accurate measurement of the liquor volume;

- demonstrate an ability to record and retrieve ultrasound images;

- able to collate, analyse data and act appropriately on findings;

- provide a verbal or a written report to the assessor on the ultrasound examinations;

- demonstrate professional and communications skills;

- demonstrate accurate management of patients;

- demonstrate awareness and knowledge of safety and quality assurance issues.

TEACHING, LEARNING STRATEGIES & METHODS

Learning support

- Practice educator
- Learning resources (computer room and indicative textbooks/access to journals)
- Access to the course leader by email/telemedicine link and the CUS website

Admission criteria

- Practicing healthcare professionals with evidence of satisfactory supervised clinical training site

Evaluation of quality & standards in learning & teaching

- CUS/AECC
- COR

Mechanisms for review and evaluation

- CUS, AECC
- COR

Responsibilities for monitoring and evaluation

- Course Coordinators
- Student Representatives

Mechanisms for gaining student feedback

- Course level student questionnaires
- Dissatisfaction with any aspect of the course allows student to lodge a formal complaint via the Director of CUS and in line with the AECC complaint procedure

Staff Development Priorities

- Academic staff undertake activities related to research, teaching, learning, student support and guidance
- Annual staff appraisals match development to needs

Course Logistics

Students will be expected to provide clinical placements, practice educators and admin support for the successful completion of training.

CUS, AECC will provide education and training support and monitor student's progress.

INDICATIVE KEY LEARNING RESOURCES
Recommended Text:

Chudleigh, T. and Thilaganathan, B., 2005. *Obstetric Ultrasound: How, Why and When.* 3rd ed. Edinburgh: Churchill Livingstone.

Journals:

Ultrasound in Obstetrics & Gynaecology
http://www.isuog.org/Journal/

Guidelines:

BMUS Recommended Charts for assessment of fetal age and size
http://www.bmus.org/policies-guides/pg-fetalmeas.asp

BMUS Safety Guidelines http://www.bmus.org/policies-guides/pg-safetystatements.asp

European Federation of Societies for Ultrasound in Medicine and Biology (EFSUMB) http://www.efsumb.org/intro/home.asp

Students will have access to the course leader and course administrator for up-to-date information on the course, notices, course handbooks, unit guides, recommended journal articles and details on deadlines for submission of assessments. Contact details of the course leader and administrator responsible for case-study assignments will be posted.