

PELVIC ULTRASOUND



DAY 1

Monday 03 June

- 08.00 Registration, refreshment and exhibition
- 08.50 Welcome, *Ippokratis Sarris, Director and Consultant in Reproductive Medicine, King's Fertility*
- 09.00 Image optimisation, ultrasound artefacts and safety, *Neil Pugh, Medical Physicist, University Hospital of Wales*
- 09.45 Transvaginal scanning: Anatomy, physiology and technique, *Nazar Amso, Emeritus Professor, Obstetrics and Gynaecology, Cardiff University*
- 10.30 Refreshment and exhibition
- 11.00 Interactive Lecture 1 – Image optimisation and machine controls, *Neil Pugh, Medical Physicist, University Hospital of Wales*
- 12.30 Lunch and exhibition
- 14.00 Interactive Lecture 2 – Orientation & measurements, *Nazar Amso, Emeritus Professor, Obstetrics and Gynaecology, Cardiff University*
- 15.30 Refreshment and exhibition
- 16.00 Diagnostic ultrasound, *Geeta Nargund, Medical Director, CREATE Fertility*
- 17.00 Close of Day 1

DAY 2

Tuesday 04 June

- 08.00 Registration, refreshment and exhibition
- 08.50 Welcome, *Ippokratis Sarris, Director and Consultant in Reproductive Medicine, King's Fertility*
- 09.00 *Pelvic pathology*, *Shyamaly Sur, Consultant Obstetrician and Gynaecologist, Queen Charlotte's Hospital, London*
- 09.45 Ultrasound guided procedures in fertility treatments, *Harish Bhandari, Consultant Gynaecologist and Sub-specialist in Reproductive Medicine, Leeds Fertility, Leeds Teaching Hospitals NHS Trust, Leeds*
- 10.30 Refreshment and exhibition
- 11.00 Follicle tracking/endometrium measuring, *Mostafa Metwally, Consultant Gynaecologist and Subspecialist in Reproductive Medicine and Surgery, Sheffield Teaching Hospitals and Chair, BFS Training Committee*
- 11.45 Early pregnancy scanning, *Tommy Tang, Consultant Gynaecologist, Regional Fertility Centre, Belfast*
- 12.30 Lunch and exhibition
- 13.30 3D ultrasound, *Kannamannadiar Jayaprakasan, Subspecialist and Hon. Associate Professor in Reproductive Medicine & Surgery, Royal Derby Hospital, Derby & University of Nottingham*
- 14.15 HyCoSy / hysterosonography, *Gidon Lieberman, Consultant Obstetrician and Gynaecologist and Sub-specialist in Reproductive Medicine and Surgery, Whittington Health*
- 15.00 Refreshment and exhibition
- 15.30 Applications of doppler, *Stuart Campbell, Consultant & Director of Ultrasound, CREATE Fertility*
- 16.30 Close of Day 2



Neil Pugh, Medical Physicist, University Hospital of Wales

Neil Pugh graduated from the University of Wales College Swansea with a degree in physics, and took up his first post as a medical physicist in Manchester. Whilst there, he completed a part time M.Sc. in Medical Physics at Leeds University. He returned to South Wales in 1985, working for 3 years in nuclear medicine before switching to the Doppler ultrasound department. During his time in Doppler ultrasound, he completed a PhD thesis investigating the effects of contrast media on the peripheral circulation. In 2001, he was appointed to the post of Consultant Medical Physicist and Head of Ultrasound Physics in the Medical Physics and Clinical Engineering directorate, with responsibility for vascular ultrasound and quality assurance. He holds an Honorary Professor post in Engineering at Cardiff University, where he runs modules in Medical Ultrasound and Foundation Science on undergraduate & PGC/PGD/ MSc courses. He heads an active research group containing several PhD students, along with personal research interests in ultrasound in the diagnosis of vascular disease and ultrasound vascularity assessment in gynaecology and fertility, both of which have resulted in many publications.

Image optimisation, ultrasound artefacts and safety

Key Learning Points:

1. To give a basic understanding of the physical principles underlying the formation of an ultrasound image and how to improve the image.
2. Common ultrasound artefacts and how to overcome these artefacts will be discussed.
3. At the end of the lecture, the trainee should understand the following: • The factors which lead to an optimal image • How the basic controls can be used to manipulate the ultrasound image • How to improve image quality • How to use ultrasound safely • Common B-mode artefacts and, where possible, how to overcome them

The topics covered in this lecture will include:

• What does image quality depend on? • Factors influencing image resolution • Factors influencing signal strength

Importance of the following on signal strength: Acoustic power / Gain / TGC / Focus

Importance of the following on resolution: Frequency / Focus

The importance of the following B-mode artefacts: Resolution artefacts / Reverberation / Refraction / Shadowing Enhancement / Other artefacts

Nazar Amso, Emeritus Professor, Obstetrics and Gynaecology, Cardiff University

Nazar Amso is an Emeritus Professor in Obstetrics and Gynaecology, Head of the Academic Department of Obstetrics and Gynaecology, School of Medicine, Cardiff University (2001-2002 and 2010-2013) and Senior Consultant in Gynaecology and Reproductive Medicine since April 1998. He qualified from the College of Medicine, University of Baghdad, Iraq in 1974, MRCOG in 1985 and PhD in reproductive medicine, London University in 1996. Nazar's clinical interests include gynaecological ultrasound, reproductive surgery and minimally invasive techniques. He was the Director of Cardiff University Ultrasound Masters programme (2004-2016). His research interests included reproductive medicine, minimally invasive treatments, gynaecological ultrasound and the role of simulation in ultrasound education. He was the founding President of the British Society for Gynaecological Imaging (2007-2016).



Transvaginal scanning: Anatomy, physiology and technique

Key Learning Points:

1. Key machine skills
2. Key patient-related skills
3. Systematic approach to transvaginal scanning

In this presentation, the speaker will emphasize on key skills, describing the key anatomical landmarks and their respective changes during the menstrual cycle.

The presentation will also demonstrate basic image orientation and optimisation skills, and a systematic approach to examining the cervix, uterus and adnexa. At the end of the presentation delegates should be able to implement these skills during the afternoon workshop and later in their own practice.

Geeta Nargund, *Medical Director, CREATE Fertility*

Founder and Medical Director, CREATE Fertility and Lead Consultant for Reproductive Medicine services at St George's Hospital, London.

Affiliations: President, International Society for Mild Approaches in Assisted Reproduction (ISMAAR).

Board Member of the British Red Cross. Board of the charity- London Emergencies Trust. Director, Walking Egg Foundation, a Belgian Charity. Member of the Guild of Health Writers, UK. Founder and CEO, CREATE Health Foundation.

Awards: "Woman of the Year Award for Charity and Community work" by RED magazine in December 2013. "RBS Chairman's Award", as the Asian Woman of the Year at the Asian Women of Achievement awards ceremony, 2014. Woman of the Year at the 60th Women of Year Anniversary Lunch by Women of the Year, 2015. Inspirational Woman Award at the 9th Inspiration Awards, 2015. STEM (Science, Technology, Engineering and Mathematics) Heroes by the Daily Telegraph in 2015. Top 10 most influential Asian women in the UK by the Asian Sunday Newspaper to mark International Women's Day, 2016. "Doctor of the Year" by the British Association of Physicians of Indian Origin in November 2017.

Publications: Professor Nargund has published several peer-reviewed scientific papers including abstracts and also several book chapters in the field of reproductive medicine and advanced ultrasound technology. Special interests: She is a regular blogger on Huffington Post on Health and Lifestyle. She introduced Fertility Education in London Secondary Schools. Campaigner for the welfare and safety of women in IVF.

Shyamaly Sur, Consultant Obstetrician and Gynaecologist, Queen Charlotte's Hospital, London

Shyamaly is a consultant obstetrician and gynaecologist and subspecialist in reproductive medicine with a special interest in early pregnancy at Queen Charlotte's Hospital, London. She graduated from Pembroke College, at the University of Cambridge and went on to train in the field of O&G within the Oxford Deanery. She also subspecialised in reproductive medicine in Nottingham, having completed her PhD there, investigating the pre-conceptual and first trimester predictors of pregnancy outcome in the IVF population. Her research interests lie within the field of early pregnancy and reproductive medicine, specifically the use of 3D USS and power Doppler to characterise pelvic pathology and first trimester measures of embryonic growth in relation to singleton and twin pregnancies as well as miscarriage which she has published in.



Pelvic pathology

Key Learning Points:

1. The use of transvaginal ultrasound, 3D ultrasound and saline ultrasonography in the diagnosis of pelvic pathology
2. During this interactive session, delegates will be introduced to the features of common benign endometrial, myometrial, tubal and ovarian pathology.
3. To enable delegates to recognise pathology at pelvic ultrasound.

Harish Bhandari, Consultant Gynaecologist and Sub-specialist in Reproductive Medicine, Leeds Fertility, Leeds Teaching Hospitals NHS Trust, Leeds

Mr Harish Bhandari is a full-time NHS Consultant Gynaecologist and Sub-specialist Reproductive Medicine in Leeds. He was awarded the Doctorate of Medicine (MD) by University of Warwick for his research work evaluating the effects of obesogenic environment on peri-implantation endometrium. He has special interests in recurrent miscarriage, recurrent implantation failure, reproductive immunology and endometrial research.

Ultrasound guided procedures in fertility treatments

Learning Point:

To learn the various ultrasound-guided procedures undertaken as a part of assisted reproductive technology treatment

Ultrasound is an important tool for undertaking assisted reproductive technology (ART) related procedures and this presentation would provide an overview of these procedures.

Trans-vaginal ultrasound guided approach is the gold standard technique for oocyte retrieval, which can be safely undertaken under sedation. Trans-abdominal ultrasound guided embryo transfer procedure appears to be associated with better pregnancy outcomes when compared to clinical-touch technique. Persistent simple ovarian cysts which fail to resolve spontaneously or with hormonal manipulation can be aspirated under ultrasound-guidance (trans-vaginal or trans-abdominal) prior to ART.

We will discuss if significant hydrosalpinx which becomes apparent during controlled ovarian stimulation should be aspirated during oocyte retrieval. Trans-vaginal ultrasound-guided methotrexate injection, complemented with systemic methotrexate has been found to be safe and effective for the management of clinically difficult ectopic pregnancies (interstitial and caesarean scar), which are more likely to be associated with ART.

Tommy Tang, Consultant Gynaecologist, Regional Fertility Centre, Belfast

Dr Thomas Tang graduated from the University of Aberdeen and did most of his specialist training in the Yorkshire region. He was awarded a postgraduate degree of Doctor of Medicine by the University of Leeds in 2007; his research focused on fertility care for women with Polycystic Ovary Syndrome.

He became a Consultant Gynaecologist and Specialist in Reproductive Medicine in 2010 and joined the team in the Regional Fertility Centre, Belfast in 2012. He is also interested on postgraduate education and is currently an associate editor in the RCOG journal 'The Obstetrician and Gynaecologist'.

Early pregnancy scanning

Recognise USS features of early intrauterine pregnancy

Diagnosis of ectopic pregnancies

Usefulness and limitations of serum hCG levels

Early pregnancy scanning in reproductive medicine settings is often different from scanning in early pregnancy units caring for women who conceive spontaneously.



Firstly, gestational age for assisted conception is fairly accurate; women are often offered very early pregnancy scan typically after 6 week's gestation, therefore it is important to recognise ultrasound features of early intra- uterine pregnancy.

Secondly, multiple pregnancy in fertility treatments are far more common than in natural conceptions, as a result high order pregnancy and heterotopic pregnancy should always be considered as a possible diagnosis in early pregnancy scanning.

Finally, ectopic pregnancy is not uncommon in assisted conception and yet most patients are relatively asymptomatic at their first scan. A high index of suspicion is needed when intra-uterine pregnancy cannot be identified; understanding the usefulness and limitation of serum hCG levels can also aid the diagnosis.

Kannamannadiar Jayaprakasan, Subspecialist and Hon. Associate Professor in Reproductive Medicine & Surgery, Royal Derby Hospital, Derby & University of Nottingham

Mr. Jayaprakasan, sub-specialist and Hon. Associate Professor in Reproductive Medicine and Surgery, is working as Fertility Unit Lead at Royal Derby Hospital, Derby and as IVF consultant at CARE fertility, Nottingham. His PhD from University of Nottingham was on standardizing the ultrasound methods of ovarian reserve assessment with particular focus on 3D ultrasound markers. He has published over 80 peer reviewed papers on fertility and ultrasound topics and has edited three textbooks including "Ultrasound in Subfertility – Routine applications & Diagnostic challenges" and "Clinical management of pregnancies following ART". He currently serves as expert adviser for NICE centre for guidelines, member of RCOG's scientific advisory committee and StratOG module editor.

3D Ultrasound

Learning points:

How to do a 3D scan

Clinical application of 3D ultrasound in a fertility unit

Evidence base on the use of 3D ultrasound

Ultrasound is absolutely essential for day to day clinical practice in a fertility unit. Conventional 2D ultrasound provides us with two-dimensional images of three-dimensional structures, which appear as real- time cross- sectional slices through the organ/structures being examined. The views can be restricted at times due to limited scan planes. In contrast, 3D ultrasound techniques rely upon production of a composite of multiple two-dimensional scan images. Computing software within the 3D ultrasound machine is then used to fill in the gaps between these images to produce a 3D image volume. The acquired 3D ultrasound volume can then be displayed in simultaneous multiplanar view, which can then be post-processed to improve spatial orientation and image interpretation. 3D ultrasound, especially its unique coronal plane view, is the modality of choice in diagnosing uterine anomalies and may help in improving diagnosis and making appropriate management plans in certain other clinical scenarios. However, other than its application in the assessment and differentiation of uterine anomalies there is limited evidence that 3D ultrasound results in clinically-relevant benefit or negates the need for further investigation.