



Center For Advanced Fetal Care Newsletter

Volume 6 Issue 2
Spring of 2015
Tripoli - Lebanon

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The Final Frontier...

...Enticing. Mesmerizing. Tantalizing. The mystifying unknown never fails in luring us... We are driven by the unquenchable desire to explore, discover and control beyond our tangible boundaries whether in medicine, on earth, or in outer space. From the **International Space Station** and its austere plans which set the stage for the portability of ultrasound and the **microgravity** program, to the relentless attempts at **Arctic drilling** in preparation for a trip to **Europa**, to the persistent attempts in looking for **alien** life, to our obstinate dreams in pursuit of **gender equality** and ultimate **world peace**... We thus dedicate this issue to the 'Final Frontier' inspired by **Dr. Scott Dulchavsky's** presentation at the Annual Convention of **AIUM/WFUMB**. We present to you the 'post-LA space index', the latest marker in the efforts to maximize the prenatal detection of challenging cardiac defects. We bring you highlights from the 2nd Bangkok Fetal Echocardiography Symposium, in addition to our usual quarterly features. Finally, we share with you Lebanon's most futuristic educational activity yet: live streaming of **ISUOG's Advanced Doppler** course which transcended all physical boundaries. It gave us immediate access to the brilliant minds of the world's luminaries laying the cornerstone in the ultimate quest for knowledge, advancement and progress. The final frontier with its excitement, hope and promise is within reach. It is time for the **final countdown**...



Peace: The Final Frontier



Europa

The Post-LA Space Index for the Detection of TAPVR

Total anomalous pulmonary venous return (TAPVR) remains a challenging yet critical congenital cardiac defect to detect prenatally. As such Kawazu et al, in their recent paper in **UOG**, address a new marker, the post-LA space index for prenatal detection of TAPVR. In their retrospective study, the authors reviewed 8 cases of isolated TAPVR (5 supracardiac and 3 infracardiac). The post-LA space index was obtained at the level of the 4 chamber view in the end systolic phase drawing a line from the crux of the heart to the center of the descending aorta. Subsequently they obtained the ratio of the distance between the left atrium and the descending aorta/the diameter of the descending aorta along this line in the 8 fetuses with TPVR. This was compared with the ratio in 101 normal fetuses. There was a statistically significant difference between the normal fetuses (mean 1.51) and those with TAPVR (mean 0.71 ± 0.23) for a $p < 0.0001$. In addition, the authors analyzed the receiver-operating characteristics curve. A post-LA space index of 1.27 had a sensitivity of 100% and a specificity of 99% for the prenatal detection of TAPVR. This is a most promising tool to be incorporated into clinical practice whenever a suspicious case for TAPVR is encountered.

'Post-LA space index' as a potential novel marker for the prenatal diagnosis of isolated total anomalous pulmonary venous connection

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Postmortem Micro-CT of Small Fetuses and Hearts

A innovative study was recently published by Lombardi et al in **UOG**. In their study, the authors evaluate the role of contrast-enhanced micro-CT for the postmortem evaluation of 7 fetuses at 7-17 weeks and 14 fetal hearts at 11-22 weeks. An isotropic resolution of 18 (9 or 35 as needed) was utilized. Four pathologist, a fetal cardiologist and a radiologist interpreted the findings. Conventional autopsy/dissection was carried out if the gestational age was ≥ 13 weeks. All anatomical and structural abnormalities documented by the macroscopic examination were successfully identified by micro-CT. In all 7 of 7 fetus at ≤ 13 weeks with no anomalies, micro-CT successfully excluded the presence of anomalies. In the remaining 14, it provided all the information provided by autopsy/dissection, and in half of them additional findings of diagnostic impact were reported. The authors thus conclude that contrast-enhanced micro-CT is a feasible post-mortem technique to use, and that further studies are indicated to evaluate its potential broader use to replace conventional autopsy.

Postmortem microcomputed tomography (micro-CT) of small fetuses and hearts

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KEYWORDS: congenital heart disease, fetal autopsy, fetal necropsy, micro-CT, postmortem, CT, pregnancy, fetal autopsy

Highlights from the Annual Convention of the American Institute of Ultrasound in Medicine Hosting WFUMB Recently Held March 21 - 25, 2015 in Orlando - Florida

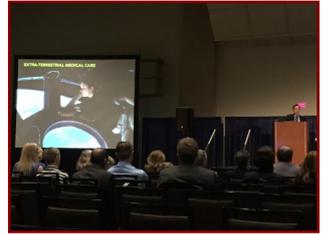
The **AIUM/WFUMB Annual Convention** recently held in Orlando was truly a landmark meeting that expanded our horizons well beyond the conventional boundaries. It featured concurrent French and Spanish sessions which brought such a unique flavor and allowed the exchange of tips and techniques to extend beyond all linguistic barriers.

The meeting commenced with several comprehensive pre-congress courses addressing obstetrical as well as non-obstetrical topics. The pre-congress course entitled 'The Fetus: Top 5-do-not-miss Diagnoses' offered a novel take on some of the most challenging pathologies in prenatal diagnosis. Two most memorable presentations were by Dr. Mastrobattista on abdominal cystic lesions, and by Dr. Abuhamad on fetal echocardiography. In addition, Dr. Ants Toi carried out a wonderful informative hands-on scanning session with a special concentration on fetal neurosonography.

The Opening/Awards Ceremony was outstanding with the opening lecture delivered by Dr. Wesley Lee who received the Williams J. Fry Memorial Lecture Award. And then it was blast off, into extraterrestrial medical care, with Dr. Scott Dulchavsky. Dr. Dulchavsky transferred us to the International Space Station, and the 'final frontier' with all the medical research being performed out there particularly on matters pertaining to human physiology at zero gravity. This would not have been possible had it not been for the portability and totipotentialness of sonography in the evaluation of all organs at the forefront of which is the human eye. His contagious passion, dedicated brilliance and revolutionary vision left such a tremendous impact, with its powerful vibes still reverberating!

Amidst the stimulating discussions throughout the scientific sessions were marvelous lectures on cutting-edge-research. Perhaps one of the most remarkable lectures was given by Dr. Elena Sinkovskaya on fetal cardiac function: pioneering work shedding light on where the future of fetal medicine lies to further unravel the mysteries of the unknown...

Stay tuned to the **AIUM Website** for online access to select convention lectures, case-of-the-day presentations and information pertaining to next year's convention to be held April 2 - 6, 2016 in Las Vegas, Nevada...



Dr. Dulchavsky in the Opening Session



Dr. Mastrobattista in the Pre-Congress

Highlights of the 2nd Bangkok International Fetal Echocardiography Symposium Held on January 14 - 16, 2015. By Mark Sklansky, MD and Alisa Limsuwan, MD

The **2nd Bangkok International Fetal Echocardiography Symposium** was held January 14-16, 2015 at the majestic Shangri-La Hotel, located on Bangkok's famous Chao Phraya River. Both years, this pioneering international fetal echocardiography symposium in Thailand has attracted a truly international group of attendees, composed predominantly of physicians (pediatric cardiologists, maternal-fetal-medicine subspecialists, and trainees), but also including sonographers and representatives from industry. The symposium focused both on improving prenatal detection of congenital heart disease, and on enhancing advanced evaluation of cardiac structure, function and rhythm in high-risk pregnancies.

The conference was directed by Drs. Alisa Limsuwan and Suthep Wanitkun, with organizational support from Drs. Poomiporn Katunyuwong, Patama Promsonthi, and Boonsri Chanrachakul, and featuring international speakers (Dr. Mark Sklansky, pediatric cardiologist at UCLA; Dr. Giuseppe Rizzo, maternal-fetal-medicine specialist from Rome and Dr. Tze Kin Lau, maternal-fetal-medicine specialist from Hong Kong), as well as widely respected pediatric cardiology, maternal-fetal-medicine and pathology experts from Thailand. The symposium provided a comprehensive series of didactic lectures from experts in pathology, pediatric cardiology, maternal-fetal-medicine, and radiology. Woven seamlessly into the didactic schedule were clinically compelling case presentations, a series of hands-on opportunities for registrants to scan actual patients with guidance from Drs. Sklansky and Rizzo, and live scanning by Dr. Sklansky of a fetal patient with heterotaxy.

The symposium's talks began with formal presentations on fetal cardiac pathology, genetics, and physiology, followed by a discussion of first trimester evaluation and the role of nuchal translucency thickness evaluation. Next, speakers presented a series of talks on current guidelines for fetal cardiac screening, and basic and more advanced techniques for fetal cardiac evaluation. Following these background discussions, experts presented a broad series of detailed, clinically oriented lectures on abnormalities of the four-chamber view and outflow tracts. The third and final day of the symposium included formal presentations and case presentations of fetal arrhythmias and of fetal 3D/4D fetal cardiac imaging, an overview of fetal cardiac tumors and, finally, a discussion and summary of take-home pearls for fetal cardiac imaging.

Throughout the conference, registrants enjoyed the incredible beauty and cuisine of the lavish Shangri-La Hotel. Given the tremendous success of this second international symposium, plans are already underway for the 3rd Bangkok International Fetal Echocardiography Symposium. Dates will be announced soon; please contact Dr. Alisa Limsuwan for additional information at alimsuwan@yahoo.com or bkkfetalecho.com.



The Speakers & Organizers



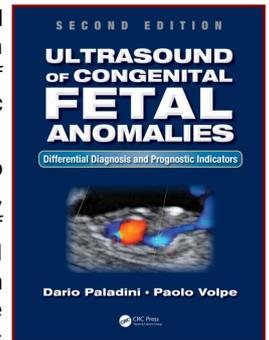
The Delegates

CFAFC Recommends 'Ultrasound of Congenital Fetal Anomalies' by Paladini & Volpe

The second edition of Paladini and Volpe's '**Ultrasound of Congenital Fetal Anomalies**' was recently released by CRC Press and is available both in print and digital formats. The textbook is written in a unique approach with superb diagrams illustrating some of the most complex congenital malformations in the simplest of manners. In addition, the text addresses the various differential diagnoses and presents the prognostic indicators for various conditions by system.

The text is comprised of 3 sections commencing with the first chapter which covers an in depth approach to ultrasound in early gestation. The middle section constitutes of 8 comprehensive chapters, each color coded, covering all systems with summary tables and flow diagrams that pair schematic and sonographic images of some of the most perplexing fetal conditions. The text culminates with 3 chapters addressing chromosomal and non-chromosomal syndromes, the role of ultrasound in fetal infections and the role of ultrasound in multiple gestation. As informative as all the chapters are, perhaps the most compelling is the chapter on the fetal central nervous system which provides an impressive 'visual' summary of the most difficult lesions affecting the developmentally-changing fetal brain. In addition, the cardiac chapter has clear and descriptive summary tables of the most common abnormalities notable on the 4 chamber view and in the evaluation of the outflow tracts.

CFAFC highly recommends this outstanding text to all who are involved in fetal imaging irrespective of their level of expertise. This reference shall prove to be invaluable in daily clinical practice for 'consultations and guidance' instantaneously in the ultrasound unit whenever a challenging fetal malformation is encountered.



THIS AND THAT

Upcoming FMF



The **14th World Congress** of the **FMF** is a few weeks away and is to be held June 21-24, 2015 in Crete, Greece. This year the congress will be held in conjunction with Eurofetus as well as the **IFMSS** (International Fetal Medicine and Surgery Society) where the first 2 days will feature both FMF and IFMSS sessions. For abstract submission, registration and accommodation information, please visit the **FMF Website**.

Upcoming ISUOG



ISUOG's 25th anniversary will be celebrated this fall in Montreal October 11 - 14, 2015. Cutting-edge research will be presented in a most stimulating environment where the leaders in ultrasound will be present to share their latest experiences, tips and pearls. This year there will be a pre-congress course '**Ultrasound in Term and Preterm Labor**' held in conjunction with the **SMFM** in addition to a 'Basic Training' course. Abstract submission is now closed and the final program will post soon. For further details and registration information, visit **ISUOG**.

Upcoming Ian Donald



The **Global Congress** of the **Ian Donald Schools** is to be held in Cagliari, Italy on June 19 - 21, 2015. This will be a joint congress with the **WAPM** and the **Dubrovnik International University**. There will be a rich program given by global leaders in the field. For further details and registration information, please visit the **congress website**.

The Scan



The latest communication tool from the AIUM, '**The Scan**', has recently been launched. The Scan is AIUM's Blog which serves as a platform for the exchange of ideas among all members pertaining to the latest in ultrasound and upcoming activities of the AIUM. The Scan has direct links to many useful sonographic blogs. For any further information, please visit the **AIUM Website**.

CFAFC News



It has been an eventful quarter for **CFAFC** with Reem S. Abu-Rustum participating in the Annual Congress of the **Lebanese Order of Physicians** - Tripoli, the Congress of the **British Jordanian Society**, the Annual Convention of **AIUM/WFUM** and the **Obs-Gyne Congress** in Dubai. She also co-authored '**The Role of Ultrasound in the Lebanese Outreach Setting**' which appeared in the April issue of the Journal of the International Association of Childbirth Education (**ICEA**).

Hot-Off-The-Press from the NEJM April 2015 Issue

ORIGINAL ARTICLE

Cell-free DNA Analysis for Noninvasive Examination of Trisomy

Mary E. Norton, M.D., Bo Jacobsson, M.D., Ph.D., Geeta K. Swamy, M.D., Louise C. Laurent, M.D., Ph.D., Angela C. Ranzini, M.D., Herb Brar, M.D., Mark W. Tomlinson, M.D., Leonardo Pereira, M.D., M.C.R., Jean L. Spitz, M.P.H., Desiree Hollemon, M.S.N., M.P.H., Howard Cuckle, D.Phil., M.B.A., Thomas J. Musci, M.D., and Ronald J. Wapner, M.D.

A recent landmark multicenter prospective study, just published in the **NEJM**, was carried out at 35 international centers with the ultimate goal of comparing standard first trimester screening to cell-free DNA testing (cfDNA) in routine prenatal populations. The study's primary end point was the area under the receiver-operating-characteristic curve for trisomy 21 using cfDNA testing and comparing it to standard first trimester screening. Secondary outcomes were comparing the 2 modalities for the detection of trisomy 18 and 13.

The study enrolled 18955 women who were undergoing first trimester screening utilizing NT and first trimester biochemistry. cfDNA testing was also carried out on all the enrolled women with the patients blinded to its results.

There were a total of 15841 results available for analysis. cfDNA was able to detect 38/38 cases of trisomy 21 at a false positive rate (FPR) of 0.06% versus 30/38 using standard screening at a FPR of 5.4%. The sensitivity for trisomy 18 was 90% for cfDNA versus 80% for standard screening, and for trisomy 13 it was 100% and 50% respectively.

The authors conclude that when carried out in routine prenatal populations, cfDNA had a higher sensitivity, lower FPR and a higher positive predictive value in comparison to standard first trimester screening.



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CFAFC expresses its sincerest appreciation to Drs. Imad Aboujaoude, Alisa Limsuwan, Toufic Naba', Cihat Şen, Mark Sklansky and ISUOG Secretariat for their contributions to this issue, and to Dr. Scott Dulchavsky for the inspiration...

*"All we know is still
infinitely less than
all that remains unknown".*
William Harvey

For any interesting case reports, comments, suggestions or announcements to be included in our newsletter, please send an e-mail to rar@cfafc.org.

ISUOG's Live Streaming in Lebanon...

Defying all geographical limitations, and facilitated by cyberspace, a group of Lebanese Ob/Gyn and Radiology physicians were able to participate in 'Doppler in Clinical Obstetrics', an advanced ISUOG course that was held in London on April 24, via live streaming. This activity was made possible through ISUOG and the ISUOG Ambassador Program, and locally by Hospital Abou Jaoude and SANA Medical NGO. The activity was planned in cooperation with LSOG and with the generous sponsorship of Clearblue and General Medical Equipment.

With the time difference between Lebanon and the UK, the day started locally at 0915. Following registration, introductory remarks were given by Dr. Reem S. Abu-Rustum in which ISUOG, its Ambassador Program and the core membership available to the attendees, and trainee membership available to the residents were covered. She presented SANA Medical NGO with its mission and achievements thus far of having provided prenatal care to over 1000 patients, and its educational commitments of which this is its most futuristic. Subsequently, Dr. Nabil Helou set the stage with key introductory points on the basics of Doppler.

It was then to the UK with the experts: Drs. Bilardo, Crispi, Hecher, Khalil, Lees, Prior and Visser. It proved to be a most unforgettable experience for over 70 total delegates who were able to attend the lectures "live" and post questions to the speakers. Many remained glued to their seats till 2040 local time.

Not only was this advanced course of the highest educational value, but it also served to further solidify ISUOG's global outreach, commitment to education and to bringing the most advanced training to all the probanders in women's health. With the geographical boundaries completely dissolved, this successful endeavor shall hopefully serve as the first among many such future activities. Thank you ISUOG for making this possible and for being the undoubted trend-setter in women's imaging...



ISUOG Live Streaming



Registration



Dr. N. Aboujaoude & Helou



Full House

Upcoming Congresses

| COURSE TITLE | DATES | LOCATION | WEBSITE ADDRESS |
|--|--------------------|---------------------------------------|--|
| 3D/4D Workshop: Practical Application of Volume Ultrasound in Fetal Medicine & Gyn | June 6 - 7, 2015 | London, UK *live-streamed globally | www.isuog.org/Events/ISUOG+Organised+courses/2015_Jun_3D+workshop+practical+app+of+volume+ultrasound.htm |
| European Human Genetics Conference | June 6 - 9, 2015 | Glasgow, UK | www.eshg.org/eshg2015 |
| 31st Fetus as a Patient | June 11 - 13, 2015 | St. Petersburg, Russia | www.etchouches.com/ehome/86745/211262/ |
| 19th International Conference on Prenatal Diagnosis & Therapy | June 12 - 15, 2015 | Washington DC, USA | http://ispdhome.org/2015/ |
| 3rd Global Congress of Ian Donald Schools | June 19 - 21, 2015 | Sardinia, Italy | www.iandonaldschool.org |
| 14th World Congress of the Fetal Medicine Foundation | June 21 - 25, 2015 | Crete, Greece | www.fetalmedicine.org/fmf-world-congress |
| 6th Annual Fetal Echocardiography Normal and Abnormal Hearts | Oct 1 - 3, 2015 | Las Vegas, NV | www.edusymp.com/product/details/806 |
| XXI FIGO World Congress | Oct 4 - 9, 2015 | Vancouver, Canada | http://figo2015.com |
| 25th Annual Congress of ISUOG | Oct 11 - 14, 2015 | Montreal, Canada | www.isuog.org/WorldCongress/2015/ |
| 5th Annual Fetal Echo Symposium at UCLA | Oct 24, 2015 | Los Angeles, CA | www.cme.ucla.edu/courses/event-description?registration_id=96321 |