



Center For Advanced Fetal Care Newsletter

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The 'Apps' of Our Lives...



In the advanced fast paced information age we are living in today, it is becoming increasingly more challenging to deal with all the various aspects of modern daily life, as well as our lives as physicians...The world is increasingly more demanding and stressful, where in order to adapt and survive, we are all resorting to the digital, to assist us in coping and surviving by compartmentalizing: an inherent, subconscious adaptive mechanism whereby the various aspects of our complicated lives are dealt with in a prioritized manner. Today, those compartments can be represented by various 'Apps', dealing with the most minuscule to the most demanding of our daily tasks, having taken on a physical existence and form on our hand-held devices. Our lives seem to be organized by each of our individual 'Apps': they dictate how we communicate, stay up to date, learn and create...And with a simple click, the chosen long-have-been dormant 'App' comes to life with all that has been compartmentalized within it now taking center stage. And in our world of medicine, this is having tremendous implications in the form of affordable, globally available learning modules, instructional how-to guides, digital books and hand-held bedside applications that facilitate transfer of data and images for diagnostic purposes, as well as on-the-spot calculations of various medical indexes at the point-of-care irrespective of where that may be...

As a result, we dedicate this issue to the 'Apps' of our lives, and specifically those applicable to ultrasound as it is taking its solid steps into becoming a pillar for all health care workers, irrespective of their area of specialty or level of expertise. As technology evolves and we further advance, adaptation becomes a necessity. We, as physicians, must evaluate our individual settings, look into incorporating ultrasound into our medical school curricula, establish national guidelines and committees in the areas of the world where they are lacking in order to ensure proper standards and adherence to these guidelines. We, as obstetricians, owe it to our residents and our inexperienced colleagues, to make this knowledge available to them in a structured manner so that they may maximize the potential of their office machines, as the 'future' is fast becoming 'today'. And for all those matters, this issue, in addition to its standard content, brings you basic guidelines to scanning in the second trimester. It also introduces you to invaluable 'Apps' that are available to you (for free download or at very affordable prices) to be used with portable smart phones and tablets, that with a click, open up limitless compartmentalized information and imagery...These 'Apps' help teach basics in ultrasound and provide user-friendly bedside calculators for fetal biometry and Doppler velocimetry, in addition to sharing knowledge and skill. We hope that by bringing to life the 'compartmentalized' we may further contribute to the dissemination of knowledge in one of the most exciting areas of medicine today: ultrasound...

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Briefing from the First WCUME



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With the tremendous advances in portable medical technology, ultrasound is fast becoming "the stethoscope of the future", a term so perfectly coined by the First World Congress of Ultrasound in Medical Education recently held in Columbia, South Carolina. This was a most successful enlightening congress that brought together experts from all over the world to share their unique experiences in ultrasound. The utility of ultrasound facilitated by today's affordable, battery rechargeable hand-held devices has infiltrated every level of medicine: from teaching anatomy and physiology to medical and healthcare students, to assisting in all bed-side and point-of-care needle-guided procedures such as thoracentesis, central line placement, and even in assessing the extent of injury post trauma upon the arrival of paramedics. And it further extends out into the limitless beyond, aboard galactic space stations...In obstetrics, its greatest impact lies in the underdeveloped world, in the areas with the highest rates of maternal morbidity and mortality, where today, there are armies of passionately driven health care providers, dedicating endless time and energy, traveling to remote areas of the world where they are making available this 'window into the womb' with the ultimate goal of impacting the unacceptable rates of maternal morbidity and mortality. There were more than 50 educational sessions and 30 workshops involving training and hands-on scanning. This was a joint venture between the University of South Carolina, WINFOCUS as well as SUSME (Society of Ultrasound in Medical Education). Membership in SUSME is currently free of charge and makes available many learning modules in ultrasound in all disciplines. To join SUSME, visit www.susme.org. Plans are now underway for the second World Congress and we will keep you updated as to its locale, abstract submission deadlines and dates...

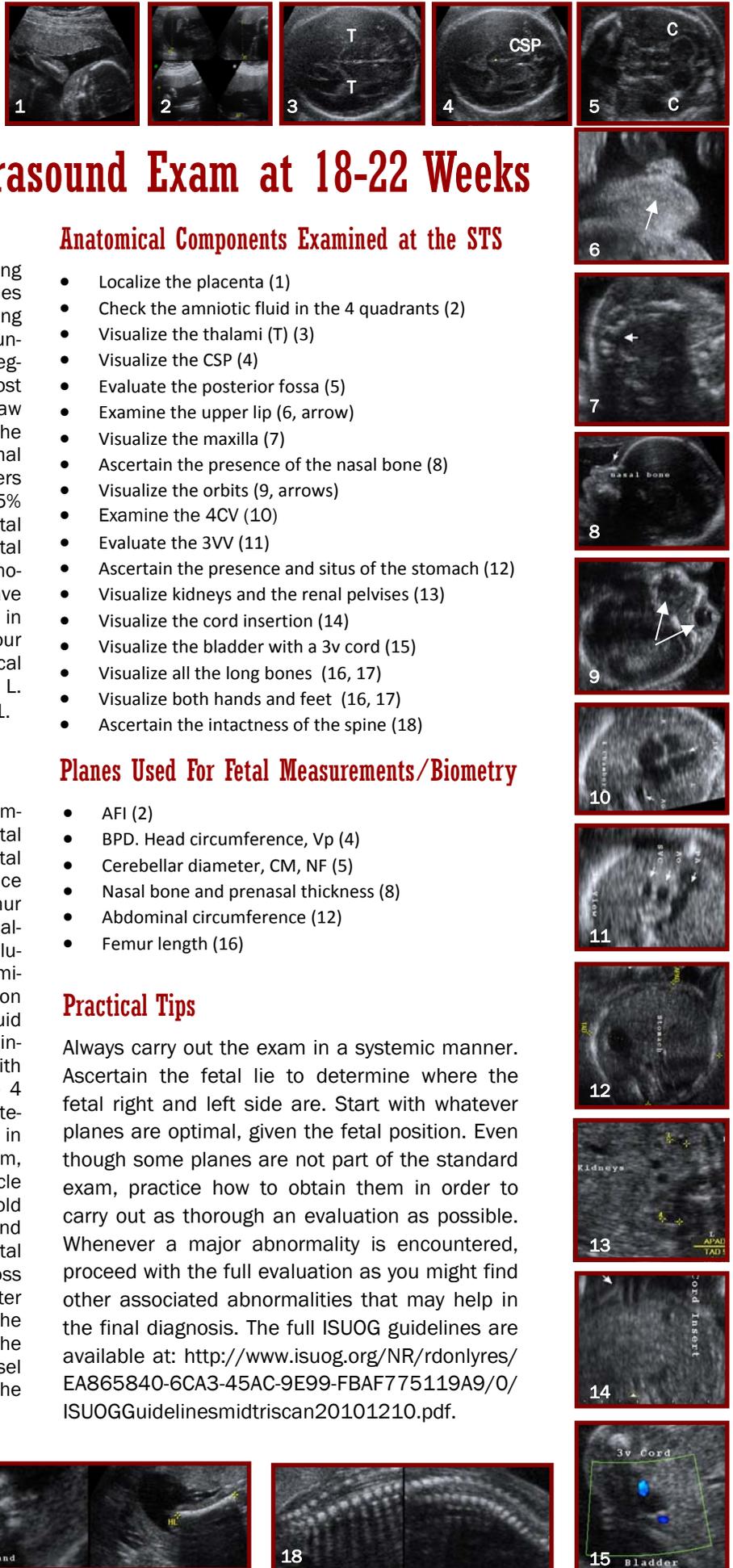
Practical Guidelines to Assist in Performing a Mid-Trimester Fetal Ultrasound Exam at 18-22 Weeks

Introduction

Congenital abnormalities continue to be the leading cause of perinatal mortality in developing countries affecting 3-5% of all pregnancies, and accounting for 1/3 perinatal deaths. The majority are of unknown causes where the only risk factor is pregnancy. As a result, prenatal ultrasound is the most effective means for screening and diagnosis (Rosaw 2000). In spite of the tremendous advances in the field, our detection rates continue to be suboptimal with reported detection rates at tertiary care centers ranging from 34.8% (Radius Trial 1993) to 55% (Eurofetus Study Group 1999). In addition, fetal growth abnormalities, are a major cause of fetal morbidity and mortality and are amenable to sonographic identification. Several organizations have set guidelines to performing a mid-trimester scan in order to standardize the exam and enhance our prenatal detection rates. Recently, ISUOG's Clinical Standards Committee under the direction of Dr. L. Salomon, has issued their new guidelines in 2011.

Outline of Current Recommendations

The ISUOG guidelines call attention to 2 main components of the exam. The first is to evaluate fetal growth and well-being by obtaining the biparietal diameter (BPD) and/or the head circumference (HC), abdominal circumference (AC) and femur length (FL). Estimated fetal weight can then be calculated. In addition fetal movement is also evaluated. The second part of the exam is a full anatomical survey starting with placental position in relation to the internal os, cord insertion and amniotic fluid index. In addition, it includes assessing for the intactness of the spine (sagittal and axial views with evaluation for the intracranial banana sign), the 4 extremities (counting fingers and toes is not an integral part), the skull shape (ruling out a lemon sign in spina bifida), thalami, cavum septum pellucidum, falx cerebri, posterior horn of the lateral ventricle (Vp), cerebellum, cisterna magna (CM), nuchal fold (NF), neck, orbits, upper lip, maxilla, nasal bone and chest (no diaphragmatic hernia). As to the fetal heart, 4 chamber view and the outflow tract cross over must be evaluated (refer to CFAFC's Winter 2011 newsletter for guidelines on evaluating the fetal heart). Finally, abdominal organ situs, the stomach, cord insertion, kidneys, bladder, 3 vessel cord, normal appearance to the bowel as well as the genitalia must be ascertained.



Anatomical Components Examined at the STS

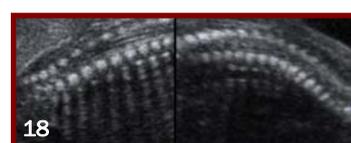
- Localize the placenta (1)
- Check the amniotic fluid in the 4 quadrants (2)
- Visualize the thalami (T) (3)
- Visualize the CSP (4)
- Evaluate the posterior fossa (5)
- Examine the upper lip (6, arrow)
- Visualize the maxilla (7)
- Ascertain the presence of the nasal bone (8)
- Visualize the orbits (9, arrows)
- Examine the 4CV (10)
- Evaluate the 3VV (11)
- Ascertain the presence and situs of the stomach (12)
- Visualize kidneys and the renal pelvises (13)
- Visualize the cord insertion (14)
- Visualize the bladder with a 3v cord (15)
- Visualize all the long bones (16, 17)
- Visualize both hands and feet (16, 17)
- Ascertain the intactness of the spine (18)

Planes Used For Fetal Measurements/Biometry

- AFI (2)
- BPD. Head circumference, Vp (4)
- Cerebellar diameter, CM, NF (5)
- Nasal bone and prenasal thickness (8)
- Abdominal circumference (12)
- Femur length (16)

Practical Tips

Always carry out the exam in a systemic manner. Ascertain the fetal lie to determine where the fetal right and left side are. Start with whatever planes are optimal, given the fetal position. Even though some planes are not part of the standard exam, practice how to obtain them in order to carry out as thorough an evaluation as possible. Whenever a major abnormality is encountered, proceed with the full evaluation as you might find other associated abnormalities that may help in the final diagnosis. The full ISUOG guidelines are available at: <http://www.isuog.org/NR/rdonlyres/EA865840-6CA3-45AC-9E99-FBAF775119A9/0/ISUOGGuidelinesmidtriscan20101210.pdf>.

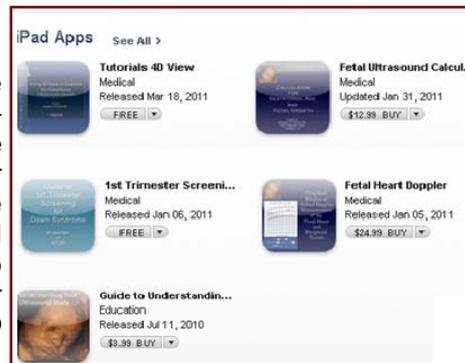


CFAFC's Sonographic 'App' Recommendations Available for Download onto Your iPhone/iPad

Created By: Gregory R. DeVore, MD. Fetal Diagnostic Center, Pasadena, California.

Available at the Apple iTunes App Store. Price Range: Free to \$24.99

With the rapid evolution of ultrasound portability and today's technology, comes the newest most useful applications for the iPhone and iPad, for patients as well as clinicians, developed by a world leader in medical education, Dr. Gregory R. DeVore. The iPhone applications provide a pocket calculator for fetal biometry as well as Doppler measurements. These may be used at the bedside or at any patient point of care (also available for the iPad). In addition, there is an iPad-specific application on fetal heart Doppler. Patients may be directed to two educational applications: "Guide to Understanding Your Ultrasound Examination" as well as an 'App' on first trimester screening. Most recently in March, a free tutorial for sonologists on how to use 4D View was added, which is of utmost utility to those venturing into 3D/4D ultrasound.



THIS AND THAT

10th World Congress of the Fetal Medicine Foundation Malta June 26-30, 2011



This year, the 10th World Congress of the Fetal Medicine Foundation will be held in Malta June 26-30. The congress will combine the Eurofetus meeting integrated into the first two days, as well as the Eurogentest meeting on the last day. Further details and preliminary program may be found at the FMF website at: www.fetalmedicine.com/fmf/courses-congress/conferences/.

Hot-Off-The-Press

Vaginal Progesterone Reduces the Risk of Preterm Birth in Women with a Sonographic Short Cervix by Hassan et al. *Ultrasound Obstetrics & Gynecology*

A recent landmark study is available as open access to all at: <http://onlinelibrary.wiley.com/doi/10.1002/uog.9017/pdf>. This multicenter, randomized, double-blinded, placebo controlled trial addresses one of the most significant contributors to neonatal morbidity and mortality: prematurity. The study enrolled women at 19-23w6d of gestation with a sonographically short cervix (10-20mm). The women were randomized to receive either vaginal progesterone gel or placebo from the point of enrollment up until 36w6d, or the occurrence of rupture of membranes and/or delivery. The primary endpoint was birth prior to 33 weeks. The study demonstrated a 45% reduction in the rate of preterm birth in women receiving vaginal progesterone, as well as a reduction in neonatal respiratory distress syndrome, events contributing to neonatal morbidity and mortality, and neonatal birth weight less than 1500 grams. This calls for global evaluation of the utility of screening for cervical length at the time of the mid-trimester scan to assess for feasibility and cost effectiveness. Nonetheless, a prerequisite is proper training and certification of providers measuring cervical length. Training and certification are available free of charge through the Fetal Medicine Foundation at www.fetalmedicine.com.



Cervical Length

Hot-Off-The-Press

The Thymic-Thoracic-Ratio in Fetal Heart Defects by Chaoui et al. *Ultrasound Obstetrics & Gynecology*

Given the association of a hypoplastic thymus with congenital heart defects (CHD) specifically del.22q (DiGeorge syndrome), Chaoui et al's recent study establishes the normogram for the ratio of the antero-posterior (AP) diameter of the fetal thymus at the level of the 3 vessel trachea view (Figure 1) to that of the AP diameter of the fetal chest in normal fetuses and those with CHD and a known normal karyotype (Figure 2). The thymic/thoracic (TT) ratio remains unchanged for fetuses between 15 and 39 gestational weeks with a mean of 0.44 in both normal fetuses as well as those with CHD but a normal karyotype. On the contrary, in 95% of fetuses with del.22q, this ratio is significantly less with a mean of 0.25 ($p < 0.001$). This simple to obtain ratio is of great clinical applicability to be used in fetuses with CHD as it helps identify a subgroup of fetuses at high risk for del.22q in order to properly counsel the family and offer targeted prenatal molecular diagnosis. Full article at: *Ultrasound Obstet Gynecol* 2011; 37: 397-403.

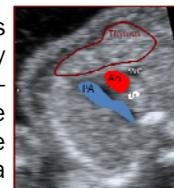


Figure 1

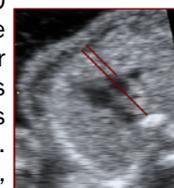
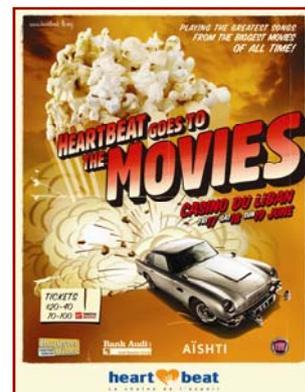


Figure 2

Heartbeat's Annual Gala Dinner & Concert

Heartbeat's annual gala dinner is planned for May 28 and this year's concert is planned for June 17-19. Talented physicians and surgeons will shed their scrubs and take on their alter-identities as musicians, with the selfsame goal of combating heart disease. The venue is the Casino Du Liban. Ticket information is available at 09859999. All proceeds will go to Lebanon's Heartbeat (www.heartbeat-lb.com) whose aim is to enable every child born with a congenital heart defect to get the necessary life saving treatment.





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CFAFC would like to thank Drs. DeVore, Tannous and Lebanon's Heartbeat for their contributions to this issue.



For any interesting case reports, comments, suggestions or announcements regarding upcoming conferences, please send an e-mail to rar@cfafc.org.

Second Trimester Diagnosis of Arthrogyposis

Reem S. Abu-Rustum, MD and Roland Tannous, MD

Arthrogyposis refers to multiple joint contractures affecting 1/3000 live births. The underlying cause may be secondary to an abnormality of muscle tissue, nerve function or connective tissue. In addition, various mechanical limitations to fetal movement may result in joint contractures.

A 32 yo G3 P2002 with no past history, a normal first trimester scan (Figure 1) with an NT of 2.2 mm and a normal first trimester anatomical survey, presented for her second trimester scan at 22w2d complaining of no fetal movement. On detailed second trimester scan, there was appropriate fetal growth and a normal amniotic fluid index. Of note was a fetus in a fixed position, throughout the duration of the exam, with multiple joint contractures. The hands were clenched and legs extended (Figure 2, arrows). In addition, there was partial agenesis of the cerebellar vermis (Figure 3, arrow). The findings were discussed with the family and re-evaluation was carried out at 22w6d. The fetus was still in the same position, and the findings unchanged (Figure 4, arrow). After extensive counseling, the family elected termination of pregnancy. An amniocentesis was performed immediately prior to the termination. Post mortem findings confirmed the prenatal diagnosis (Figure 5). The karyotype was 46 XY.

Our case attests to the importance of the second trimester scan, to complement a first trimester scan with the latter's gestational-age based limitations that may preclude the diagnosis of certain highly morbid fetal conditions.



Figure 1



Figure 2

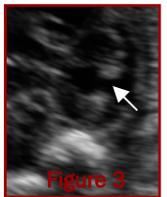


Figure 3



Figure 4



Figure 5

Upcoming Congresses

| COURSE TITLE | DATES | LOCATION | WEBSITE ADDRESS |
|---|-----------------------|-------------------------|--|
| Preeclampsia from Bench to Bedside | May 27, 2011 | Verona, Italy | www.soluzioniverona.it/preeclampsia2011/ |
| Advances in 3D/4D Ultrasound | June 3-5, 2011 | Cleveland, Ohio, USA | www.iame.com/conferences/td9/ |
| Perinatal Medicine 2011 | June 15-17, 2011 | Harrogate, UK | www.perinatalmedicine2011.ukevents.org |
| 10th World Congress in Fetal Medicine | June 26-30, 2011 | Portomaso, Malta | www.fetalmedicine.com |
| 21th World Congress of the International Society of Ultrasound in Obstetrics and Gynecology | September 18-22, 2011 | Los Angeles, California | www.isuog.org/WorldCongress/2011/ |
| Obstetrical Ultrasound in the High Risk Patient | October 14-16, 2011 | Las Vegas, Nevada | https://iame.com/conferences/hr12/ |
| 67th Annual Meeting of the American Society of Reproductive Medicine | October 15-19, 2011 | Orlando, Florida | www.asrm.org/annualmeeting.aspx |
| Second Annual Fetal Echocardiography: Normal and Abnormal Hearts | October 28-29, 2011 | Las Vegas, Nevada | www.edusymp.com/meetingview.asp?productid=4283 |
| Ultrasound Meets Magnetic Resonance at the Louvre | October 28-29, 2011 | Paris, France | www.ultrasound2011.org/index.aspx |
| National Conference on Ob/Gyn Ultrasound | November 4-6, 2011 | Chicago, Illinois | https://iame.com/conferences/ob14/ |