Objectives: This study aimed to validate the feasibility and accuracy of a new 6-step basic approach for obstetric ultrasound examination intended for the low-resource setting.

Methods: Standardized stepwise approach was performed prospectively on 100 pregnant women between 18^{+0} and 27^{+6} weeks of gestation; and another 100 pregnant women between 28^{+0} and 36^{+6} weeks of gestation. Findings on the basic standardized approach were compared to the conventional ultrasound examination in the second and third trimester. Six steps focused on different aspects, step 1: fetal presentation; step 2: cardiac activity; step 3: number of fetus(es); step 4: position of placenta; step 5: amniotic fluid; step 6: fetal biometry.

Results: The stepwise approach was successfully performed on all 200 pregnant women. In cases between 18^{+0} and 27^{+6} weeks of gestation, percentage of matched pairs between basic stepwise approach and conventional approach from steps 1 to 5 were 96%, 99%, 100%, 95% and 98%, respectively. Kappa value also showed good consistency. The coefficient of variation for biparietal diameter (BpD), head circumference (HC), abdominal circumference (AC) and femur length (FL) were 1.8%, 1.9%, 3.5% and 2.5%, respectively. In cases between 28^{+0} and 36^{+6} weeks of gestation, percentage of matched pairs between basic stepwise approach and regular approach from step 1 to 5 were 99%, 99%, 100%, 99% and 94%, respectively. Kappa value also showed a good consistency.

Conclusions: The new basic stepwise approach can be performed successfully and accurately between 18^{+0} and 36^{+6} weeks of gestation.

2076943　The Role of Ultrasound in the Lebanese Outreach Setting

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Objectives: To assess the role of introducing ultrasound into the obstetrical outreach setting in Lebanon among a mixed population of mothers of underserved Lebanese and Syrian refugees.

Methods: This was a cross sectional study carried out over a three years period during the medical outreach missions of SANA Medical NGO in North Lebanon. Data were collected by a single obstetrician who obtained full medical and obstetrical histories. The obstetrician examined all patients and performed obstetrical sonography. The sonographic goals were to: 1- ascertain pregnancy dating 2- evaluate fetal well being and screen for congenital malformations 3- measure the amniotic fluid and 4-

determine placental location. Descriptive statistics were performed and sonographic findings were compared between the Lebanese and the Syrian refugees mothers. Outcome delivery data were not available. Data were analyzed using SPSS Version 19. Chi-square test was utilized to compare any differences between mothers of the underserved Lebanese and the Syrian refugees. $P < 0.05$ was considered statistically significant.

Results: There were a total of 669 patients included in the analysis of whom 467 (69.8%) were Lebanese and 202 (30.2%) were Syrian refugees. SANA redated the pregnancies of 124/669 (18.5%). There were 7/669 (1%) fetuses with anomalies and 11/669 (2.6%) pregnancies with amniotic fluid abnormalities. In addition, there were 2/669 (0.3%) pregnancies with a placenta previa and another 2/669 (0.3%) with an in utero fetal demise. There was a statistically significant difference between the Lebanese and Syrian patients in terms of wrong dates (P <0.0001) and the presence of fetal anomalies (P 0.017).

Conclusions: The introduction of ultrasound into the Lebanese outreach settings plays a significant role in properly dating the pregnancies in addition to identifying at risk fetuses and detecting placental abnormalities. In the Lebanese setting, this impact is greater amongst the Syrian refugees. As such, sonographic evaluation in the Lebanese outreach obstetrical setting needs to be more available and more systematic in order to secure a safe outcome for mothers and their offspring.

2095290　Sonography Interval and Diagnosis of Twin-Twin Transfusion Syndrome

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Objectives: To evaluate the relationship between sonographic surveillance for twin-twin transfusion syndrome (TTTS) and gestational age and stage at diagnosis.

Methods: We reviewed monochorionic diamniotic pregnancies with TTTS followed with serial sonography at a single institution from 1997 to 2013. All sonogram images were reviewed by an investigator to confirm Quintero stage. Gestational age and stage were compared in those diagnosed at initial sonogram or at a subsequent sonogram either within or >14 days from a prior exam.

Results: TTTS was diagnosed in 48 pregnancies, 50% at the 1st, 19% at the 2nd, and 31% at or after the 3rd sonogram. Overall, 50% were stage I, 10% stage II, 29% stage III, and 10% stages IV or V at diagnosis. Those diagnosed at initial sonogram developed disease earlier than those diagnosed during a subsequent exam, 21.4 ± 3.6 weeks vs 25.1 ± 4.3 weeks, P=0.001, but there was no difference in TTTS stage at diagnosis, P=0.2. Among those diagnosed during a follow-up sonogram, 29% had isolated oligohydramnios and 17% isolated hydramnios at the sonogram *preceding* diagnosis. Isolated fluid abnormalities were more common if the prior exam was within 14 days than if >14 days, 70% vs. 21%, P=0.01. Stage III was more likely to be

Sonography Interval and Diagnosis of TTTS

| Stage | Diagnosed at Initial Sonogram | | Sonogram Interval ≤ 14 days | | Sonogram Interval > 14 days | |
	n (%)	Gestational Age, weeks	n (%)	Gestational Age, weeks	n (%)	Gestational Age, weeks
I	11 (46)	21.2	3 (30)	24.8	10 (71)	27.3
II	4 (17)	21.1	1 (10)	26.1	0	-
III	6 (25)	20.5	6 (60)	22.3	2 (14)	23.0
IV	1 (4)	25.5	0	-	2 (14)	24.7
V	2 (8)	23.2	0	-	0	-

Results: Thirteen gravida were evaluated. The gestational age ranged from 33w 0d and 38w 0d.

The maternal kidney and liver calculated (SHRR) confirmed none of the women were suspected to have hepatic steatosis.

The fetal liver was imaged in the sagittal plane 50 times with a median pixel intensity of 108.1 and a SD of 18.51. The liver was imaged 36 times in the axial plane (A=115.26) SD=15.13. The fetal kidney was imaged in the sagittal plane 23 times (A=82.1) SD=16.19. The fetal spleen was imaged in the axial plane 21 times (A=112.81) SD=20.56. The fetal lung was imaged in the sagittal plane 25 times(A=124.0) SD=19.37. The fetal adrenal was imaged in the axial plane 13 times (A=78.92) SD=17.08. The Ratio of the liver to the reference organ in the image was calculated and the average Liver/Adrenal ratio was 1.54(SD=0.35); Liver/Lung was 0.86 (SD=0.14); Liver/Spleen was 1.05 (SD=.20); and Liver/Kidney was1.34(SD=1.39)

Conclusions: Pixel intensity fluctuates from image to image in a fetus. Calculating a ratio with a reference organ can compensate for this.In the adult the SHRR uses the R kidney cortex as a reference organ. The increased heterogeneity of the fetal Kidney(large SD) compared to lung and spleen makes the kidney a less sensitive reference organ for detection of changes in fetal liver echogenicity which might signal NAFLD changes in the fetus. We hope to use these measurements as a baseline for comparison when we evaluate women at high risk for NAFLD during pregnancy.

2076941 Feasibility of Visualizing the Cerebellum at the Time of NT Assessment

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Objectives: To assess the feasibility of visualizing and measuring a clear transcerebellar diameter (TCD) at the time of the first trimester scan (FTS) and to assess which factors influence successful visualization.

Methods: Prospective study on 139 gravidas between 11 and 14 weeks undergoing FTS for aneuploidy and structural fetal abnormalities at 2 centers in Lebanon. All scans were carried out transabdominally by 2 experienced sonologists. After the evaluation of the butterfly from an axial plane, the BPD was measured. Utilizing an axial tilt, it was attempted to visualize the posterior fossa and the cerebellum was considered visualized with the TCD measured only if clear anatomy of both cerebellar hemispheres was demonstrated. The relationship of the fetal CRL and BPD to the TCD was established and compared to the normogram established by Egle et al. The influence of maternal BMI, fetal CRL and BPD on successful visualization of the cerebellum was evaluated. Twin gestations, fetuses with an NT >95th centile and fetuses with aneuploidy or a structural abnormality diagnosed in the first trimester were excluded from the analysis. Regression analysis was used to study the reference range of the TCD according to the fetal CRL. $P < 0.05$ was considered statistically significant.

Results: The cerebellum was successfully visualized and measured in 19/139 fetuses (13.7%) with a mean TCD of 10.7 mm. Comparing fetuses in which the cerebellum was not seen (120) to those in which it was seen (19) revealed no statistically significant difference between maternal age or BMI. There was a statistically significant difference in both the CRL and BPD as follows: mean CRL of 68.3 vs 74.9 mm (p < 0.0001) and mean BPD of 22.5 vs 24.4 mm (P < 0.0001) respectively. Our data revealed that the BPD increases with CRL according to the relationship: TCD= 0.181 CRL – 2.8318 with an R^2 of 0.6505 where our TCD tended to be larger than the TCD established by Eagle et al.

Conclusions: Our study attests to the low transabdominal cerebellar visualization rate of only 13.7% at 11-14 weeks. The fetal CRL and BPD are the most influential factors facilitating visualization. As such, the second trimester remains the ideal time for proper evaluation of the fetal cerebellum.

2074928 Determining Fetal Adiposity in Utero Based on Sonographic Measurements of Fetal Buoyancy (Rate of Fetal Rise, RFR)

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Objectives: Accurate identification of pathologically large for gestational age (LGA) or small for gestational age (SGA) fetuses is clinically challenging; sonographic measurements tend to overestimate and underestimate the weights of suspected LGA and SGA fetuses, respectively. We sought to validate a new method for evaluating fetal weight in three groups of gravidae: those with an uncomplicated pregnancy, and those with suspected LGA or SGA.

Methods: 34 gravidae with gestational age over 34 weeks were prospectively enrolled. Routine biometry was performed and two sets of subcutaneous skin thickness were sonographically measured, alongside AFI and placental location and thickness. The fetus was then manually depressed downward and its ascent (rate of fetal rise (RFR)) was recorded in a clip. The rate of fetal rise was then calculated as a measure of frames, distance, and time. Postnatal anthropometry was completed, including PeaPod DEXA scanning in a subset of infants (n 10). Robustness of sonographic measurements to postnatal anthropometric measures were assessed by Pearson's, with linear regression for covariates.

Results: As shown in the table, there was no correlation between the RFR and infant birthweight. However, there were significant correlations between RFR and the neonate's BMI, Ponderal Index, and body fat percentage.

Conclusions: Only 95% of sonographic measurements are within 20% of birthweight. Fetal buoyancy, as measured by the RFR, is a potentially promising new modality for predicting not only birthweight but also clinically relevant adiposity in the neonate.

Pearson's correlation coefficients for rate of fetal rise against measures of neonatal adiposity

Measure of adiposity	Pearson's correlation	Significance
Body mass index	0.356	0.049
Ponderal index	0.363	0.045
Birth weight	0.282	0.124
Fat mass	0.307	0.099
Lean mass	0.338	0.067
Body fat (%)	0.369	0.041

3D RTE images were also created for the 47 malignant tumors. Most malignant tumors 42 cases (89.4%) exhibited Type 3.

Conclusions: In 3D stereoscopic images obtained by Real-time Tissue Elastography with Real-time 3D probe, blue contrast reflects hardness distribution in the tumor. In stereoscopic images composed mainly of blue, the shape and border properties are considered useful in determining whether the tumor is benign or malignant. Sequential changes in hardness distribution, this technique may be used for evaluation of treatment and may be applied to biopsy as a puncture guide by adding hardness information of the tumor by stereoscopic images.

Fetal Echocardiography

Moderator: Reem Abu-Rustum, MD

2076927 Is the Brain-Sparing Effect Described in Fetuses With Congenital Heart Disease Evident in the First Trimester?
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Objectives: The brain sparing effect reported in fetuses with congenital heart disease (CHD) describes compensatory cerebral vasodilatation with redistribution of cerebral blood flow in the face of compromised fetal oxygenation. This protective mechanism may be insufficient to maintain normal brain growth and development. Fetuses with hypoplastic left heart (HLH) and transposition of the great arteries (TGA) have been noted to have a smaller head. As such the aim of this study was to determine whether the brain sparing effect, as reflected by the fetal BPD, is apparent in the first trimester.

Methods: Retrospective study on 820 controls and 32 fetuses known to have CHD who had undergone first trimester screening for aneuploidy and structural fetal abnormalities at 2 centers in Lebanon. All scans were carried out transabdominally by 2 experienced sonologists with the fetal NT, CRL and BPD measured. Maternal age, BMI, gravidity and parity were obtained. The presence of extracardiac anomalies and aneuploidy in fetuses with CHD was recorded. Live born fetuses were evaluated by a pediatric cardiologist and the diagnosis confirmed. The BPD as a function of the fetal CRL of fetuses with CHD was plotted against the established normogram in our population with the fetuses having CHD divided into 3 groups: the group with HLH, the fetus with CoA and finally fetuses with other cardiac anomalies.

Results: A total of 32 fetuses were included in the analysis: 9/32 (28.1%) with HLH, 2/32 (6.3%) with CoA and 21/32 (65.6%) with AV canal, HRH, VSD and other cardiac abnormalities. Karyotype was available on 6/32 (18.8%) fetuses and of those, 5/6 (83.3%) had trisomy 21 and 1/6 (16.6%) had an unbalanced translocation. Extracardiac abnormalities were present in 4/32 (12.5%). Of the 32 fetuses, 13 were live born

(40.6%). Termination of pregnancy was carried out on 14/32 (43.8%). There was spontaneous in utero demise in 2/32 (6.3%) and 3/32 (9.4%) were lost to follow up. The fetal BPD as a function of the CRL revealed no difference between fetuses with CHD and normal fetuses.

Conclusions: The brain sparing effect, exemplified by alterations in the fetal BPD, is not apparent in the first trimester.

2082399 Fetal Myocardial Performance Index During Progression of Labor
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Objectives: The Myocardial Performance Index (MPI) is a Doppler derived myocardial function tool. It has been used in perinatology to evaluate systolic and diastolic dysfunction in fetuses with twin to twin transfusion syndrome and intrauterine growth restriction. The OBJECTIVES: of the study was to investigate the MPI during labor of normal term pregnancies, to establish normative values, and to evaluate change with cervical dilation.

Methods: Women with uncomplicated, term, singleton pregnancies were recruited to this prospective observational study at Thomas Jefferson University Hospital. Exclusion criteria were multiples, fetal anomalies, preterm labor, non-cephalic presentation. Participants underwent an ultrasound examination by one sonographer, during which fetal left and right sided isovolumic contraction time (ICT), isovolumic relaxation time (IRT) and ejection time(ET) were recorded before, during and after contractions. Right and left sided MPI were then calculated using the formula $MPI = (ICT+IRT)/ET$. MPI was measured before, during and after uterine contractions. The MPI was calculated using an average of three measurements of ICT, IRT and ET. Statistical analysis was performed with student t-test, and X^2 as appropriate. A p value of <0.05 was considered statistically significant.

Results: 20 patients were recruited. On average, patients were 29.2 ± 5.7 years old, in their 4th pregnancy, with a BMI of 32.9 ± 5.0 at delivery. The average left MPI during labor in term fetuses was 0.34 ± 0.04. The average right MPI during labor was 0.22 ± 0.07. There was no difference in Left or Right MPI based on contraction timing (p= 0.82, p= 0.80). The coefficient of correlation (R value) between MPI and cervical dilation was 0.15 for Left MPI Index and 0.09 for Right MPI.

Conclusions: Myocardial Performance Index is a non-invasive, easily attainable measure of cardiac function that can be obtained during labor and does not change with labor. The fetal MPI may help define fetal status in labor.

2087673 Fetal Cardiac Function in Pregnancies Complicated by Preterm Birth
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and families. Utilizing 3D ultrasound in its various modalities enables arriving at difficult diagnoses at earlier points in gestation.

2076973 Normogram for The First Trimester Fetal BPD At 11-14 Weeks In An Unselected Lebanese Population

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Objectives: The study's OBJECTIVES: was to establish the normogram for the BPD in an unselected Lebanese population and to compare it to the normogram established by Salomon et al in order to determine if there may be any ethnic variation.

Methods: Prospective study on 820 fetuses with confirmed dating undergoing a first trimester scan at 11 to 14 weeks. The fetal CRL and BPD were measured on all fetuses. Twin gestations, cases with aneuploidy or structural abnormalities and fetuses with an NT > 95th centile were excluded. All fetuses were term live births with a normal neonatal examination at birth. Regression analysis (polynomial second degree) was used to establish the relationship between the fetal BPD and the fetal CRL. P < 0.05 was considered statistically significant.

Results: A total of 820 fetuses were included in the analysis. Mean GA was 13.1 weeks. Mean CRL was 71.1 mm. Mean BPD was 23.4 mm. Mean maternal BMI was 24.95. Our data revealed that the BPD increases with CRL according to the relationship: BPD = -10.698 + (0.719 × CRL) − (0.33 × 10^{-2} × CRL^2) with a p-value of < 0.0001 and an R^2 of 0.56. There is no statistically significant difference between our normogram and that established by Salomon et al.

Conclusions: Our study demonstrates that in an unselected low risk Lebanese population the normogram for the fetal BPD at 11-14 weeks is similar to what has previously been established by Salomon et al with no evidence for any ethnic variation.

2077111 Is Real-Time Elastography Using Manual Compression A Viable Method For Providing A Differential Diagnosis Of Benign And Malignant Thyroid Nodules?

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Objectives: The aim of this systematic review was to assess the effectiveness of real-time ultrasound elastography using manual compression in providing differential diagnosis of benign and malignant thyroid nodules. The review aims to establish whether this imaging technique can be used as an alternative to a FNA biopsy.

Methods: In order to standardise elastography findings and help classify thyroid nodules, various scoring systems have been developed. This review focusses on a 5 point scoring system developed by Ueno and Ito for the assessment of breast lesions, but which is now being used for assessment of thyroid nodules.

A comprehensive search of the literature related to thyroid elastography using the 5 point scoring system was undertaken. Studies relevant to the review were critically analysed and summated in order to answer the review question.

Results: There is unanimous agreement in the general findings between the included studies. These studies show that for the nodules they examined, real-time elastography and assessment using the 5-point scoring system is a highly sensitive (86-97%) and specific (89.5-100%) method for providing a differential diagnosis of benign and malignant thyroid nodules. Meta-analysis suggests an elastography score of 1-3 (based on the Ueno and Ito scoring system) is highly indicative of a benign nodule, and an elastography score of 4-5 (based on the Ueno and Ito

scoring system) is highly indicative of a malignant nodule. In the combined studies, real-time elastography was shown to be unsuitable for nodules that are mostly cystic or those that contain large calcifications.

The results from these studies are largely comparable with those described in the general literature.

Conclusions: Real-time elastography using manual compression has the potential to be a viable method for providing a differential diagnosis of benign and malignant thyroid nodules. However, there is still a lack of comprehensive large scale studies into the technique. Until further studies have been carried out, elastography should be used as an additional tool in the assessment of thyroid nodules, to compliment conventional ultrasound and FNA cytology.

2077183 Effect of Acidemia on Cardiac Function

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Objectives: It is commonly assumed that acute metabolic acidosis has an adverse effect on cardiocirculatory dynamics and in-vitro experiments utilizing cultured myocardial cells have shown that acidemia impairs cardiac function. In-vivo, however, cardiac function is regulated by multiple factors and it is the sum of these factors that determines cardiac function. Because of the differing effects of acidosis on contractile force, vascular tone, and sympathetic discharge, it is difficult to predict what happens in vivo from studies of isolated organs. Our OBJECTIVES: in this study is to evaluate the effect of acidemia on cardiac function in emergency department (ED) patients.

Methods: Study Design: This was an IRB-approved prospective observational study to determine the effect of acidemia on cardiac function in patients being treated for diabetic ketoacidosis (DKA). The acidemia encountered in DKA patients is reversible with treatment allowing for repeatable transthoracic echocardiography (TTE) evaluation of cardiac function at varying pH levels. Patients diagnosed with DKA and found to have an arterial blood pH ≤7.1 were eligible for enrollment. Patients with chest pain, altered mental status, sepsis, acute coronary syndrome, pulmonary or liver disease were excluded. TTE was obtained upon discovery of the acidosis in the ED and repeated after pH normalization (pH = 7.3). Hospital cardiology staff performed the TTE. Measurements included left ventricular (LV) internal diameters at end-systole (LVIDs) and end-diastole (LVIDd), end-systolic volume (ESV), end-diastolic volume (EDV), and LV ejection fraction (LVEF).

Results: Fourteen patients (7 male, 7 female, average age of 34.4) completed the study. 2 patients with normal initial LVEF, LV diameters and valvular function at the time of severe ketoacidosis did not complete the study. ESV and EDV were significantly lower during severe ketoacidosis (P ≤0.02). LVEF was not only normal but trended towards being higher (P =0.079) than at the time of acidosis resolution. LVIDd and LVIDs were not statistically different.

Conclusions: This study is the largest to date evaluating the effect of pure metabolic acidosis on myocardial function in vivo. Severe ketoacidosis did not adversely affect myocardial function as evaluated by TTE.

2076879 Recommendations for Sonographers to Work Safely, Comfortably and Healthfully (JSUM)

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programs, of which observed MSUS demonstration during patient encounters (86.4%) was the most common form. Overall, 52.8% and 63.9% of programs feel that some residents will be competent in diagnostic and interventional MSUS, respectively, upon graduation.

Conclusions: MSUS is a growing component of PM&R residency education. Resident exposure to MSUS is widespread, but implementation of formal curricula lags behind. As more programs integrate MSUS into residency training, further development of competency milestones will likely be needed.

2076630 An Enhanced Ultrasound Technique For Functional Evaluation Of Spermatogenesis

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Objectives: The only quantitative method used today to assess testicular function is Johnsen scoring of testicular histopathology. We propose that the heterogeneity found in testicular ultrasound images correlates with testicular function. To evaluate this heterogeneity we employ a noninvasive process that uses a dithering technique in which the pixels of an ultrasound image are transformed into a binary map. We then apply an algorithm to this binary map to determine Dynamic Range (DR) values. These DR quantities are used to assess levels of heterogeneity in gray scale ultrasound images. The purpose of this paper is to evaluate the correlation of DR with testicular histopathology.

Methods: A retrospective review of all men who underwent testicular biopsy at our institution as part of a fertility evaluation was performed. All patients had ultrasound images taken preoperatively. The average DR for a single testis was obtained by performing the dithering method on five different ultrasound images and then averaged. The histologic specimens were reviewed by a single pathologist using a modified Johnsen criteria (0 to 10, >7 normal and ≤7 impaired spermatogenesis) to assess for the degree of impaired spermatogenesis. Pearson correlation, linear regression and Student's t-test were obtained.

Results: Testicular biopsies were performed on a total of 32 patients. Complete data was available for 55 testes. A statistically significant negative correlation was found between DR and Johnsen scores (R2=0.29, Pearson r=-0.52, p<0.01). Johnsen scores ≤7 are associated with a mean DR=3.51. Whereas Johnsen scores ≥8 were associated with a mean DR=2.51.

Conclusions: Intratesticular DR correlates with impaired spermatogenesis on testis biopsy. Evaluation of testicular ultrasound images through use of a dithering technique provides functional information. Potential exists for this non-invasive technique for real time assessment of testicular function.

2076879 Recommendations for Sonographers to Work Safely, Comfortably and Healthfully (JSUM)

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Objectives: The Japan Society of Ultrasonics in Medicine (JSUM) wrote and published 'Recommendations for equipment and working environment to prevent work-related musculoskeletal disorders

(WRMSD) and eye disorders' to assist Japanese sonographers. These recommendations (guidelines) for the ergonomics of ultrasonography exist in Europe ,America and Australia. Systematic guideline for preventing work-related disorders of sonographers taking into account the situation in Japan is needed.

Methods: The Ultrasound Equipment and Safety Committee (JSUM) produced the committee for ergonomics of ultrasonography in 2010. The committee for ergonomics of ultrasonography is composed of the members stated below. Doctors,sonographers, researchers of diagnostic ultrasound system constructors and researchers of ergonomics in Japan. The committee for ergonomics of ultrasonography carried out the following. ・ A questionnaire about Diagnostic Ultrasound System and working environment for members and specialist training facilities of Japan Society of Ultrasonics in Medicine . ・ Investigated sonographers' physical stress during abdominal and cardiac ultrasonic diagnosis by each joint angle measurement. ・ Examine the equipment for ultrasonography and work environment from an ergonomic standpoint.

Results: ・ One of four Japanese sonographer had diagnosis of the work-related musculoskeletal disorders ・ As for the Japanese sonography, The sonographer inspected it with at risk posture to become the factor of the work-related musculoskeletal disorders. ・ Clarified the specifications of the apparatus and the optimum of the work environment to become the most suitable work posture for Japanese. ●Specifically for Equipment, clarified the desirable the operation panel height and moving range, monitor height, the height of the chair and couch etc.

Conclusions: 'Recommendations for Equipment and working environment to prevent work-related musculoskeletal disorders and eye disorders' were written and published by The Japan Society of Ultrasonics in Medicine (JSUM) to assist Japanese sonographers, manager of sonography's facilities and diagnostic ultrasound system constructors in 2012.

2076966 The Role of 3D Ultrasound in the First Trimester Diagnosis of Spina Bifida

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We present the case of a 22 year old female, gravida 1 para 0, in a consanguineous marriage, referred at 12w6d for an abnormal fetal profile with suspected kyphoscoliosis.

Upon evaluation, there were several findings including a neural tube defect involving the cervical and thoracic spine, kyphoscoliosis, and though the butterfly sign and the intracerbral translucency were seen, an abnormal posterior fossa with a near obliteration of the future cisterna magna was present. The fetal NT was increased: 2.9 mm at a fetal CRL of 71.4 mm. In addition, the NB was present and the DV had a positive a-wave. Cardiac evaluation revealed symmetrical 4 chambers, no tricuspid regurgitation, normal outflow tracts in their respective cross over, a normal 3 vessel view and normal sagittal views of the aortic arch and the venae cavae. The fetal stomach, kidneys, bladder and 3 vessel cord were seen. There was suspected talipes.

The findings were discussed with the family and though initially the diagnosis was not clear to them, the 3D rendered images of the neural tube defect using surface mode, HD*live, m*aximum mode and VCI with TUI helped clarify the anomaly and allowed them to appreciate the extent of the lesion.

Given the extremely early gestational age, this being the earliest case of spina bifida diagnosed at our center, the decision was made to reassess the fetus in 2 weeks. The findings were reconfirmed at 14w5d. The family opted for termination of pregnancy. A postmortem examination was declined, however the findings were ascertained at birth.

Our case attests to the importance of 3D ultrasound in clarifying challenging diagnoses arrived at in the first trimester to both caregivers