

**Learning Curve and Factors Influencing the Feasibility of Performing Fetal Echocardiography  
at the Time of the First Trimester Scan**

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**Objective:** To assess the learning curve and factors influencing the feasibility of carrying out a complete fetal cardiac evaluation at the time of the first trimester scan (FTS).

**Methods:** Prospective study on 104 gravidas presenting for FTS at 11w6d-13w6d. Maternal body mass index (BMI), fetal crown-rump length (CRL), and 8 cardiac parameters were evaluated: 4 chamber view (4CV), tricuspid regurgitation (TR), outflow tracts cross over (CO), bifurcating pulmonary artery (BPA), 3 vessel view (3VV), aortic arch (AoA), superior and inferior venae cavae in sagittal views (VC) and Dopplers of the ductus venosus (DV). All exams were carried out transabdominally by a single sonologist certified by the Fetal Medicine Foundation. The average time from the first to the last cardiac image obtained was calculated.

**Results:** 103 fetuses were evaluated. Median CRL was 72.1 mm (range 53.9-85.8 mm). Median BMI was 23 (range 17.7-32.3). The 4CV and TR were obtained on 100%, CO on 90%, BPA on 81%, 3VV on 55%, AoA on 76%, VC on 65% and DV on 99%. A complete exam was feasible in 55% of cases: in 15% of the first 52 and 94% of the last 51 cases. Of the 8 parameters, 59.5% were seen in case 1-21, 75% in case 22-52 and 98.6% in the last 51 cases ( $P=0.0001$ ). Average time spent on the cardiac exam increased among the 3 groups: 4.37, 7.13 and 9.3 minutes respectively ( $p=0.032$ ). There was no statistically significant influence of CRL ( $p=0.899$ ) or BMI ( $p=0.752$ ). The gained sonographer experience and duration of the exam were the most significant factors.

**Conclusion:** Fetal cardiac evaluation is feasible in the first trimester. At least 52 exams are needed for a significant improvement in the ability to carry out a complete exam. The 3VV and VC are the most challenging views to obtain. Gained sonographer experience and allocation of time seem to be the most influential factors affecting the completeness of the exam.

## Evaluation of Ultrasound Training in Obstetrics & Gynecology Residency Programs in Lebanon

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**Objective:** To evaluate ultrasound training in Obstetrics & Gynecology (Ob/Gyn) residency programs in Lebanon regarding quality of training and the residents' own evaluation of their sonographic capabilities. In addition, the need for establishing and incorporating a standardized approach to ultrasound training was assessed.

**Materials and Methods:** Questionnaires were e-mailed to all residents (n=74) of the seven Ob/Gyn residency programs in Lebanon. The questionnaires inquired about the year in training, exposure to ultrasound in medical school and the type of sonographic training being offered. Residents were asked about the adequacy of sonographic training by rating their capabilities in evaluating 21 obstetrical and gynecological criteria using a 5 level Likert scale. In addition, they were asked whether a more structured sonographic training is needed. The data were analyzed using descriptive statistical approach, t-test and ANOVA test of means.

**Results:** The response rate was 53/74 (72 %). One program, with 3 residents, did not participate. The residents were first-year 12 (23%), second-year 11 (21%), third-year 11 (21%), and fourth-year 18 (34%), representing 47-100% of the total residents in each of the participating programs. Three residents (6%) felt that their sonographic training was adequate and 52/53 (98%) felt that they needed further training in ultrasound before graduating and would benefit from a standardized process of ultrasound training. The majority, 45/53 (85%), were planning a fellowship. The areas of greatest confidence were in determining fetal viability (73%), pregnancy location (61.8%) and placental localization (53.8%). The areas of greatest weakness were first trimester nuchal translucency measurement (19.8%), Doppler studies (8%) and 3D/4D ultrasound (2%). Around 1/4 of the residents (24.5%) had a technicality score (TS) above the average (< 50%). The TS was not related to gender (p=0.328) and was similar comparing first with second-year residents and third with fourth-year residents. However, the TS was significantly higher comparing third and fourth-year residents with those in the first two years of training (p=0.004).

**Conclusion:** There is a lack of structured training in Ob/Gyn ultrasound in Lebanon's residency programs where only 6% of residents feel that they are receiving adequate training and 98% believe that they need more training prior to graduating. Nonetheless, the areas in which the residents feel that they have the most skill are those directly impacting maternal morbidity and mortality. This calls for incorporating a standardized approach to theoretical and practical obstetrical and gynecological training in ultrasound in Lebanon's Ob/Gyn residency programs.