

## **FETAL ULTRASOUND** **BIOPHYSICAL PROFILE (BPP)**

### **Patient Prep (recommended):**

Patients are recommended to drink 32 ounces of water 2 hours prior to exam time. The water should be finished 1 hour prior to exam time. The patient should have a full bladder for exam.

### **Survey:**

Perform a real-time limited survey of the fetus that is 14 weeks or greater.

1. Evaluate maternal uterus.
2. Evaluate cervical length.
3. Evaluate the fetus for position.
4. Evaluate fetal cardiac activity and heart rate.
5. Evaluate placenta for grade, echogenicity, attachment to uterine wall, location and relationship to internal cervical os.
6. Evaluate amniotic fluid level.

Use Doppler or color flow to distinguish vessels and on any abnormalities.



Multiple pregnancies require that a survey is performed for placental number, gestational sac number, presence or absence of an interposed membrane, compare amniotic volume, umbilical cords and fetal genitalia (when visualized). Each fetus will have the required documentation.

### **Image Documentation:**

Each image must be labeled with the patient's full name, medical record number, accession number, initials of the imaging technologist, organ/area identification and scanning plane.

If an image of a structure is not well seen, take an image of the structure and annotate the purpose of the image (i.e. right ovary not well seen).

### **For dating purposes:**

If an EDD (Estimated Date of Delivery) has been determined from a prior ultrasound this is to be used for dating. If the patient has not had a prior ultrasound but the LMP (Last Menstrual Period) is known for sure use this date. If the EDD and LMP are not available dating will be based on the measurements from this ultrasound.

All follow up ultrasounds will use the established EDD from the first ultrasound for dating. This will show growth of fetus between ultrasounds.

NOTE: After obtaining the required images of the patient can void for comfort if there is adequate amniotic fluid for good visualization for the remainder of the exam. If the patient gets lightheaded allow them to lie on their side or sit up.

## General Procedure description:

### **UTERUS**

1. Representative images of the uterus in the longitudinal axis demonstrating midline (inferior, mid, fundal), right of midline and left of midline.
2. Representative images of the uterus in the transverse plane demonstration inferior, mid and fundal.
3. Any abnormality of uterus documented in longitudinal and transverse axis with measurements. A color flow image of abnormality if appropriate.

### **PLACENTA**

1. Longitudinal axis images of the placenta to include both edges and mid region.
2. Evaluate the cord insertion into the placenta.
3. Evaluate the placenta grade, echogenicity, attachment to uterine wall, location and relationship to internal cervical os.
4. Transverse axis images of the placenta.

### **AMNIOTIC FLUID INDEX (AFI)**

1. When the fetus is at 18 weeks gestation provide an AFI.
2. In the longitudinal axis measure the amniotic fluid in all four quadrants of the uterus with the anterior-posterior (AP) approach. There should not be any fetal body parts or umbilical cord in these measurements. These measurements will be added together to calculate the AFI.
3. When the fetus is at 14 weeks gestation in the longitudinal axis measure the Maximum Vertical Pocket of amniotic fluid. This may be one of the measurements from the four quadrant measurements. This measurement will be used to diagnose the range that the amniotic fluid level falls in.
4. The normal range for the Maximum Vertical Pocket is 20mm – 80mm. Below 20mm would be Oligohydramnios and above 80mm would be Polyhydramnios.
5. Provide the information on the worksheet from the charts provided based on fetal age.

### **Gender**

1. When requested by ordering physician, medically indicated and with multiple gestations document the gender on the image when seen. When providing images to the patient do not document the gender on the image if you are not absolutely positive what the gender is.

### **UMBILICAL CORD**

1. Image the umbilical cord in the transaxial view to visualize that there is a 3 vessel cord (2 arteries and 1 vein).
2. If a 3 vessel cord cannot be identified. Provide a transverse image of the umbilical arteries adjacent to the bladder if possible.
3. Image insertion of umbilical cord into fetus abdomen with spectral color flow.
4. Image insertion of umbilical cord into placenta with spectral color flow.

## **UMBILICAL CORD DOPPLER**

1. Perform when requested from ordering physician.
2. When obtaining umbilical cord Doppler images obtain two velocity measurement in loop free area of the umbilical cord. These should be obtained at the straightest segments away from both the fetus and placenta insertion sites. If no straight segments areas can be found, use a segment closer to the fetus instead of the placenta. No angle correct should be utilized. Need resistive Index (RI) and S/D ratio (systolic velocity/diastolic velocity).

## **CARDIAC ACTIVITY**

1. Evaluate and image in the transverse axis for a four-chamber heart. Label image right or left side so situs can be determined.
2. Evaluate and image heart rate and rhythm utilizing M Mode. Record this tracing and calculate the heart rate. Note any Brady, tachycardia or erratic heart beats.
3. Cine loop (clip store) needs to be utilized to confirm or exclude cardiac activity.
4. Doppler or color flow should only be utilized on a fetal heart when an abnormality is suspected or to confirm no cardiac activity.

## **BIOPHYSICAL PROFILE (BPP)**

1. Fetal Breathing Movements: At least 1 episode of breathing for  $\geq 30$  seconds in 30 minutes. Cine loop (clip store) needs to be utilized to confirm breathing movement.
2. Gross Body Movement: At least 3 discrete body or limb movements in 30 minutes (episodes of continuous movement are considered a single movement). Cine loop (clip store) needs to be utilized to confirm gross body movement.
3. Fetal Tone: At least 1 episode of active extension with return to flexion of fetal limb(s) or trunk in 30 minutes. Opening and closing of hand is considered normal tone.
4. Qualitative AFV: One pocket of amniotic fluid that measures  $\geq 2$  cm in the vertical plane.

During a biophysical profile exam the fetus will either score a 2 or 0 for the requirements listed. If the fetus meets the requirements listed a score of 2 will be given. If the fetus does not meet the requirements listed a score of 0 will be given.

The fetus needs to be observed for 30 minutes before a score of 0 can be assigned.

Provide images of the calculation package.

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