

# OB FOLLOW UP ULTRASOUND PROTOCOL (UOBF)

## THIS EXAM WILL INCLUDE:

- Biometry
- Cervix before 24 weeks
- AFI after 24 weeks
- Fetal position
- Completion of fetal anatomy previously not seen
- Protocol also to be used for multiple gestations. See additional images needed below.

**\*\* Requisitions should be read carefully to ensure the proper exam is performed.**

**\*\* See separate protocols for OB Basic and Detailed Anatomy and OB Limited exams.**

**\*\* See specialized protocol for TTTS (Twin to Twin Transfusion Syndrome) and TAPS (Twin Anemia Polycythemia Sequence) when requested with mono-di and mono-mono pregnancies.**

**\*\* See minimum additional images for FL or HL measuring <2%. If indicated, a referral will be made to MFM for further evaluation and full skeletal dysplasia survey**

**\*\*If anatomy was cleared before 17 weeks 0 days, all anatomy images need to be repeated. If it was cleared on or after 17 weeks 0 days, it does not need to be repeated.**

**\*\* If it has been greater than 3 weeks since last biometry was done, new biometry will be obtained unless it clearly states not to. OB Limited Protocol to be used if this is the case.**

**\*\*If a patient has not been seen within our system and is referred to us for a limited exam or follow up growth, the provider must indicate where the anatomy study was done and be clear that we do not need to repeat it.**

**DATING: Refer to dates used on previous ultrasounds or Working EDD listed in EPIC.**

## IMAGES TO OBTAIN

### MATERNAL STRUCTURES:

#### **UTERUS: Only if indicated**

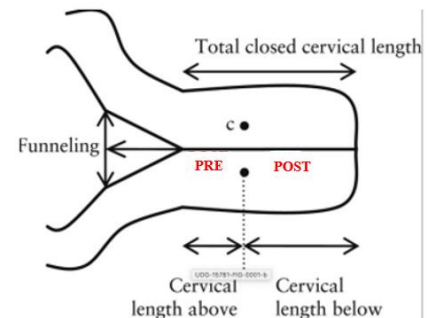
- Follow up fibroids if previously seen.
- New or incidental findings should also be imaged.

#### **ADNEXA AND OVARIES: Only if indicated**

- Follow up cysts or masses if previously seen.
- New or incidental findings should also be imaged.

## CERVICAL LENGTH AND STATUS:

- To be measured on all pregnancies less than 24 weeks gestational age. Normal cervical length is greater than 3.0 cm before 24 weeks.
- For pregnancies less than 24 weeks, if the cervix appears shortened, funneled, or if a cervical length is specifically requested, a transvaginal (or translabial) ultrasound should be performed, and the following should be documented.
  - Total cervical length
  - Closed length of cervix
  - Open length if funneling is present (NOT funneling width). Greater than 50% open length of cervix is associated with higher risk of preterm delivery.
  - Document whether the cervix is dynamic. If dynamic, report shortest closed cervical length.
- Transvaginal ultrasound is not needed to evaluate the cervix after 24 weeks. If you find a short or dilated cervix transabdominally during an ultrasound exam, contact the referring provider and inform them of the findings. If the referring provider cannot be contacted, call triage nurse or L&D.
- For cerclage evaluation: Take 2D images, as well as cine sweeps, of the cervix showing suture in transverse and sagittal. Measure the total cervical length AND closed cervical length from stitch to external os. Do not apply fundal pressure or Valsalva with patients that have a cerclage.



## PLACENTA:

- Placental position in sagittal and transverse.
- Relation to the internal os. If there appears to be a low-lying placenta, take measurements of distance from inferior margin of placenta (and from the sinus if present) to the internal os. A low-lying placenta is considered to be within 2 cm of the cervical os, or 1.1cm from the placental sinus.
- Relation to the internal os. If there is a previa or low-lying placenta take measurements of distance from inferior margin of placenta to the internal os.
- Show thickness and echo texture and comment if abnormal.
- If clinically indicated: placental masses, accessory or succenturiate lobes with location of connecting vascular supply to the primary placenta
- Cine of any abnormality.
- If accreta is suspected, see additional images needed at the end of protocol.

**FETAL POSITION:**

- Document fetal position

**FETAL HEART RATE:**

- Measure fetal heart rate M-Mode. Normal range is 110 – 170 bpm. If the fetal heart rate is above or below, refer to Urgent OB Contact List to contact charge nurse or L&D. If at outpatient clinics, contact the referring provider or on call OB staff for further instructions.

**AMNIOTIC FLUID VOLUME:**

- Amniotic fluid volume evaluation before 24 weeks should be done subjectively.
- Calculate AFI after 24 weeks, or if appears abnormal before 24 weeks, using four quadrant measurements.
- For multiple gestations (twins, triplets, etc) measure the MVP. If Mono/mono gestation, use four quadrant measurements.
- Fluid pockets measured should be greater than 1cm in width.

**AFI LEVELS (FOUR QUADRANTS)**

<5cm	Oligohydramnios
5-8 cm	Borderline Low
8-20cm	Normal
20-24cm	Borderline High
>24cm	Polyhydramnios

**SINGLE MVP AMNIOTIC FLUID LEVELS**

<2cm	Oligohydramnios
2-8cm	Normal
>8cm	Polyhydramnios

**FETAL BIOMETRY: Measure each of the following at least two times**

1. **BPD** –measured on an axial plane that traverses the thalami and cavum septum pellucidum.
2. **HC** – include in image with BPD.
3. **AC** - Transverse image through the upper abdomen at the level of the fetal stomach, umbilical vein, and portal sinus.
4. **Femur** - See additional image requirements at end of protocol if HL or FL measure <2% .

# **FETAL ANATOMY**

## **HEAD:**

- Lateral ventricles with measurements (normal < 10mm).

## **HEART:**

- 4 chamber view
- Lt ventricular outflow tract, 5 chamber view, which shows the relationship of the Aorta to the ventricular septum.
- Right ventricular outflow tract, showing branching of the PA.

**STOMACH:** Transverse view

**BLADDER:** Transverse view

## **KIDNEYS:**

- Sagittal kidneys with measurements, labeled Right and Left
- Transverse picture of kidneys at the level of renal pelvis.
- Measure any pelviectasis if present in a transverse view (APRPD anterior-posterior renal pelvic diameter) and follow the UTD Classification System.

**Normal:** 16-27weeks 6 days APRPD <4mm

>=28weeks APRPD <7mm

**A1:** 16-27weeks APRDP 4 to <7mm with central calyceal dilation

>=28weeks APRDP 7 to <10mm central calyceal dilation

**A2-3:** 16-27 weeks APRDP >=7mm

>=28weeks APRPD >=10mm

### **Exceptions:**

- Peripheral calyceal dilation without meeting criteria is upgraded to A2-3
- Abnormal echogenic renal parenchyma is upgraded to A2-3
- Ureter dilation without meeting criteria is upgraded to A2-3

**See Macro for Urinary Tract dilation.**

**COMPLETION OF ANY ANATOMY NOT WELL SEEN ON PRIOR EXAMS.**

**\*IF ABNORMALITIES ARE SEEN, INCLUDE ADDITIONAL 2D IMAGES, CINE SWEEPS, 3D IMAGING AND COLOR DOPPLER IMAGES AS NEEDED.**

**\*IMAGES THAT DO NOT NEED TO BE DOCUMENTED ON FOLLOW UP EXAMS IF PREVIOUSLY CLEARED:**

- |                                  |  |
|----------------------------------|--|
| • Extremities                    | • Diaphragm  |
| • Spine                          | • Posterior fossa, cerebellum, CSP, choroid plexus |
| • Orbits, profile, nose & lips,  | • Situs  |
| • Cord insertion/Cord origin/3VC |  |

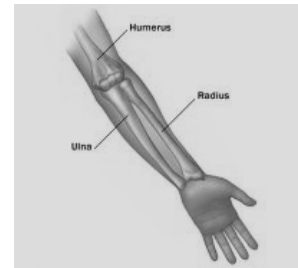
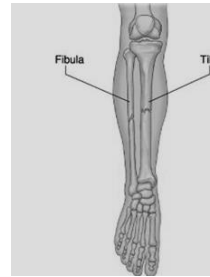
# ADDITIONAL IMAGES TO BE OBTAINED AS NEEDED

## LONG BONES (FL or HL) MEASURING <2%

### 1. MEASURE BILATERAL LONG BONES-

Note whether long bones and skull show proper mineralization, curvatures, or fractures:

- Femur
- Tibia
- Fibula
- Humerus
- Radius
- Ulna



### 2. CHEST CIRCUMFERENCE

### 3. SAGITTAL AND CORONAL VIEWS OF CHEST

showing chest size in relation to abdomen.



*Bell shaped chest*

### 4. DETAILED ANATOMY IMAGE REQUIREMENTS IF ONLY A BASIC WAS ORDERD

## MULTIPLE GESTATIONS - Twins, Triplets, etc.

SEE SPECIALIZED PROTOCOL FOR TTTS (TWIN TO TWIN TRANSFUSION SYNDROME) AND TAPS (TWIN ANEMIA POLYCYTHEMIA SEQUENCE)

**Uterus:** Sagittal and transverse cine sweeps to show orientation of fetuses.

**Position:** Document each fetus' position within in the uterus as well as presentation

- On each uterus image label the location of fetuses with A, B etc.
- Include description of fetus location in Presentation section of Viewpoint report.

**Membrane / Chronicity and Amnionicity Assessment:**

- Document the free-floating membrane between each fetus and ensure membrane is not adhered to fetus.
- Demonstrate membrane completely separating each fetus
- Document the thickness of membrane.
- Look for twin peak sign (diamniotic) or T-sign (monoamniotic)

**Placenta:**

- Document both placentas and determine if there are separate or shared placentas present. Show twin peak sign between placentas if visualized.
- Describe the location of each placenta

**Amniotic Fluid:**

- Amniotic fluid volume evaluation for multiples. Measure the deepest pocket (MVP) for each. In mono/mono pregnancies use 4 quadrants for AFI assessment.

## UMBILICAL ARTERY DOPPLER: Done at 24 weeks or greater for FGR.

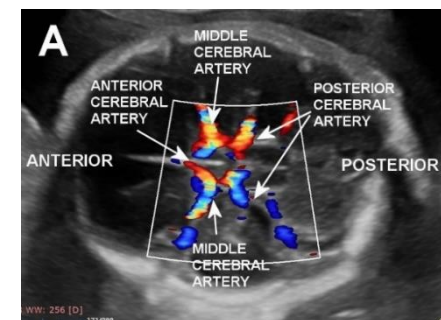
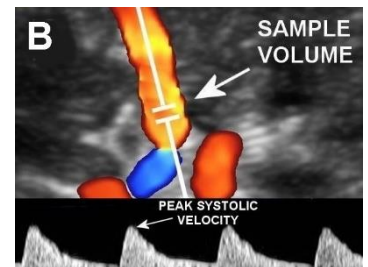
- Perform UA Doppler as requested, or if either of the following is determined-
  - AC is <10% or if EFW is <10%

### FOR MULTIPLES –

- Di-Di Twins: UA Doppler should be obtained for BOTH twins when one is FGR
  - Mono-Di or Mono-Mono Twins: UA Doppler should be obtained for BOTH twins when one is FGR or as requested.
- Technique:
    - 3 spectral doppler samples of the umbilical artery are taken at the middle section of the umbilical cord.
    - The sample with the highest S/D ratio is documented in the OB report.
    - Avoid being close to the fetus or placental cord insertions.
    - For multiples, if necessary, the cord can be traced from fetal cord insertion to ensure the proper fetal cord is documented in cases where it is challenging to determine which cord corresponds to a certain fetus. In this case, it should be clearly stated on the report that the doppler was obtain at the fetal end to accurately compare to prior and future measurements.
    - If a dramatic difference is seen in S/D ratios between exams, BOTH umbilical arteries should be sampled and compared. There are cases where one artery has normal flow, and the other is abnormal. Describe this in the report if this is the case.
  - An Umbilical Artery S/D ratio of > 95th percentile is considered abnormal.
  - If absent end diastolic flow (or reversed diastolic flow) is seen, this needs to be reported urgently via a phone call to the clinical team before the patient leaves. The patient may be admitted.
  - Absent diastolic flow does not mean that the S/D is = 1 (same with reversed diastolic flow.) Report these as “Absent diastolic flow or Reversed diastolic flow”.

**MIDDLE CEREBRAL ARTERY DOPPLER:** MCA dopplers may be ordered after 26 weeks to assess for TAPS (Twin Anemia Polycythemia Sequence) in MCDA twins. Increased peak systolic velocity in the MCA can be suggestive of developing fetal anemia. MCA dopplers will not be performed as part of the routine TTTS surveillance unless specifically requested by provider.

- Technique:
  - Be careful not to apply too much pressure to the fetal head as this can affect intracranial pressure on the vessels. This can lead to false readings.
  - MCA peak systolic velocity should be taken at a zero-degree angle
  - Only the most anterior MCA should be used for obtaining velocity.
  - MCA should course directly toward the transducer with no angulation of vessel to the side.
  - Visualize the entire length of the MCA and enlarge the area of the MCA so that it occupies 50% or more of the screen.
  - Place spectral doppler cursor just outside its origin.
  - Measurement should be taken at least 3 times.
  - Using the highest of the 3 sample velocities taken.
  - The risk of anemia is highest in fetuses with a pre-transfusion peak systolic velocity of 1.5 times the median or higher.



**FETAL HYDROPS ASSESSMENT:** (Defined by two of the following)

1. Ascites,
2. Integumentary edema
3. Pericardial effusion
4. Pleural effusion
5. Placentomegaly

**SEE SEPARATE SPECIALIZED PROTOCOLS FOR:**

- Multiple Gestation Complications – TTTS/TAPS
- Placenta Accreta Assessment
- Chest Anomalies:
  - Congenital Diaphragmatic Hernia (CDH)
  - CPAM (Congenital Pulmonary Airway Malformation)
  - Pulmonary Sequestration
- Gastroschisis/Omphalocele Anomalies
- Skeletal Dysplasia
- Fetal Arrhythmia

## OB FOLLOW UP IMAGE LIST

IMAGE	MODE
<b>GENERAL</b>	
Presentation	2D
FHR	M-mode
AFI >24wks	2D+
Cervix <24wks	2D+
Placenta Sag -recheck if low lying or previa	2D
Placenta Trans	2D
Plac Edge/CVX -recheck if low lying or previa	2D+
Eval any fibroids or ovarian cysts seen on prior	2D+
<b>HEAD</b>	
BPD/HC x 3	2D+
Lateral Ventricle w/ measurement	2D+
<b>HEART if able</b>	
4CH	2D
LVOT	2D
RVOT	2D
<b>ABDOMEN</b>	
AC x3	2D+ x3
Stomach	2D
Kidneys Trans	2D
Rt Kidney Sag w/ measurement	2D+
Lt Kidney Sag w/ measurement	2D+
Bladder	2D
<b>ADDITIONAL IMAGES IF NEEDED</b>	
<i>UMBILICAL ARTERY IF EFW OR AC &lt;10%</i>	<i>Spectral</i>
<i>ALL LONG BONES IF FL &lt;2%</i>	
<i>SKELETAL DYSPLASIS PROTOCOL IF FL &lt;1%</i>	
<i>REPEAT ANY PREVIOUSLY SEEN ABNORMALITY</i>	
<i>IF NEW FINDING SEEN, ADD DETAILED ANATOMY VIEWS IF NOT DONE PREVIOUSLY</i>	
<i>Falx</i> <i>Vermis</i> <i>Nasal Bone w/ measurement</i> <i>Maxilla /Mandible</i> <i>Lungs</i> <i>Ductal Arch</i> <i>Aortic Arch</i> <i>IVC/SVC</i>	



## OB FOLLOW UP PROTOCOL HISTORY

	Date	Changes made	By whom
Updated			Becky Marion
Updated	5/1/2022	-Format Change -Added UA, MCA, Percreta sections	Renee Betit Fitzgerald
Approved	5/5/2022		Manjiri Dighe
		Added to Doppler section - -Do both twins if either is ordered -Ok to follow cord from abdomen to ensure correct fetus in multiples -Sample both arteries if big discrepancy between exams	
Change	9/29/2022	UA dopplers for Di-Di Twins only to be done on FGR twin. Mono-di/Mono-Mono will remain both twins	Manjiri Dighe and Edith Cheng
Added	10/25/2022	Placenta Accreta Protocol Checklist 1-10	Renee Betit Fitz
Added	10/25/2023	Agreed on AFI level chart	Manjiri Dighe Edith Cheng Renee B Fitz
Changed	5/5/2023	Cerclage image was incorrect. Pre and Post labels revised. Removed Placenta Accreta section – see specialized protocol	OB Protocol meeting 4/27/23 Dighe, Cheng, Ma, Hitti, Shaun, Renee, Dalene
Added	5/5/2023	Intro statements for TTTS protocol and skeletal dysplasia protocols	
Added	5/23/2023	If anatomy was cleared on or after 17 weeks 0 days, it does not need to be repeated.	Manjiri Dighe
Added	4/16/2024	Image lists	Renee Betit Fitzgerald
Change	7/25/2024	Added 1.1cm for cut off of low lying from placental sinus  Di-Di Twins: UA Doppler should be obtained for BOTH twins when one is FGR  Workflow change: Due to time restraints, patients will be referred to MFM for full survey and workup if long bones are incidentally seen on routine imaging. Minimum images to still obtain are: Bilateral long bones, chest circumference, sagittal image of chest. Detailed anatomy views if a basic was ordered	Combined Protocol Meeting MFM/RAD Attendees: M. Dighe, E. Cheng, J. Hitti, M. Richley, S Bornemeier, B. Marion, R. Betit Fitzgerald