OB 2\textsuperscript{nd} & 3\textsuperscript{rd} Trimester Follow-up & Limited Protocols

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**Last Reviewed:** September 2019  
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**NOTE:** All elements of this protocol should be acquired for all follow-up & limited orders and indications, unless otherwise directly guided by a radiologist.

- BPP orders should be treated as all other follow-up & limited indications and require all elements below.

**General:**

**Cardiac activity:** M-mode tracing for all; \textit{CINE} of HR at discretion of technologist (unless BPP, then required)

→ Note any abnormal heart rate or rhythm

→ If HR $<$120, $>$ 160: At least 2 M-mode images to confirm persistence

→ On worksheet, document both HR measures and average

**Presentation:**

→ For multiple gestations, document chorionicity and amnionicity

**Fluid:**

- At $<$ 24 weeks: qualitative (normal, high, low)

- ADD semi-quantitative when:

  (1) Subjectively abnormal
- If oligohydramnios, include measurement of deepest pocket

(2) AFI specifically requested

(3) Known chromosomal or anatomic abnormality, especially, abdominal wall defect, kidney, bladder, stomach/intestines/esophagus, spinal cord or intracranial

- At >= 24 weeks: semi-quantitative on all

**DETAILS on semi-quantitative:**
- Singleton: Amniotic fluid index (AFI = calculated based on 4 quadrants)
- Multiples: Maximum/deepest vertical pocket (MVP/DVP) in each

Contact the radiologist for NEW oligohydramnios, defined as:
- AFI <= 5 cm (singleton)
- Single deepest vertical pocket <= 2 cm (singleton + multiples)

**Placenta:** location, appearance, relationship to internal os (still images acceptable unless r/o abruption, abdominal trauma, abnormality detected, or other at tech discretion)

→ Origin of cord *shown in 2 planes*, required on all follow-up studies.

→ Images should be in **greyscale and color**
  - *Add CINE if abnormality detected* (unless only eccentric origin)
  - Document cord origin for all cases as one of the following:
    - Normal = central
    - Abnormal/other:
      - Eccentric (but > 2 cm from the edge)
      - Marginal (<= 2 cm from the edge)
      - Velamentous
      - Other (with description)

→ *It is critical to document to presence or absence of previa on all OB US*
  - Show at least 1 still image of most inferiorly extending part of the placenta, with label; include the internal os (if possible, depending on placental position)
  - *Add CINE if abnormal*
→ Add TV if: suspect accreta, evaluating previa

→ Accepted verbiage:
  - Low-lying: 0-2 cm from internal os (note that “marginal” no longer used)
  - Previa: covering internal os (does not matter how much)

-Add **CINE** through placenta in 2 planes IF:
  → Indication is “rule out abruption” or “abdominal trauma”
  → Abnormality is detected
  → Technologist discretion

**Umbilical cord:** document number of vessels on all; placental origin on all; fetal insertion is optional on follow-up studies

  → 2 *umbilical arteries around bladder is required for all cases*, *shown with color*
    → Cross-sectional view of cord optional
  
  → Placental origin is required on all follow-up examination (see above).

  → Fetal insertion is optional unless reason for follow-up, previously abnormal, not previously documented and/or umbilical artery Doppler is being performed

→ When to do umbilical artery Doppler:

  1. Requested
  2. IUGR (sonographic estimated fetal weight < 10%) or worrisome change in weight in fetus at > = 24 weeks
  3. New oligohydramnios
  4. Optional: Cord abnormality – discuss with radiologist prior to performing

  *See end of document for S/D Ratio Reference Ranges*

→ What to provide: 6 total spectral tracings = 3 of each umbilical artery
- Each umbilical artery should be sampled at the fetal insertion, the mid-cord, and the placental origin (when possible)

- Additional tracings can be acquired as necessary

- Range of S/D ratios for each site (not average)

- Comment on absent or reversed diastolic flow

**Cervix:** document length if possible

→ Provide image with and without color

→ If appears shortened (specifically, 16-28 weeks: <30 mm) or abnormal on routine TA: Empty bladder and do TV (see end of document for best technique)

  → If TV contraindicated or declined: translabial/transperineal imaging (with empty bladder) should be performed for accurate length

  → If concerning findings at 28-32 weeks, discuss with radiologist regarding need for TV

**If ordered to assess for cervical length or pre-term labor:** TV (with empty bladder) regardless of transabdominal length unless otherwise specified**

**EFW/Dating (fetal measurements required only if requested in order):** after 14 weeks 0 days, perform biometry = measure HC, BPD, AC, FL

→ This should be an average of 2 to 3 measures for each

NOTE #1: Acquire a different image of the fetal part for the 2nd/3rd measurement (unfreeze and re-acquire). **AVOID re-measuring on the same image.**

NOTE #2: OK for 1st set of BPD and HC (different parameters) to be on the same image. However, 2nd/3rd set of BPD and HC measurements need to be on a newly acquired 2nd/3rd image.

→ If there is a >10 day discrepancy between HC and BPD, measure occipital-frontal distance (OFD)

  --> This will allow the radiologist to calculate “corrected BPD”

  [For your information: Corrected BPD = square root of (BPD x OFD / 1.265)]

**NOTE for late dating (i.e., end of 1st trimester or early 2nd trimester)**

- LMP/dates <= 13w6d → CRL
  - If CRL >=84mm → add biometry (and provide separate AUA)
- LMP/dates >=14w0d → biometry
  - If Biometry <=13w6d → add CRL (and provide separate AUA)

**FURTHER DETAILS (as per 1st Trimester OB US protocol)**

- **At LMP/provided dating <= 13 weeks 6 days:** measure CRL
  - Embryo should be magnified and in neutral position
    - Use *average of 3* discrete measures if all adequate, otherwise choose best
  - Provide AUA based on CRL

**BUT IF CRL >= 84 mm, ADD** biometry (BPD + HC + AC + FL)

- Biometry: at least 2 measurements of each
  - Use average if all adequate, otherwise choose best
  - Provide 2 separate AUA: Do NOT average CRL and Biometry
    - (1) AUA for CRL
    - (2) AUA for Biometry

- **At LMP/provided dating >= 14 weeks 0 days = 2nd trimester US:** do biometry as per 2nd/3rd trimester US protocol
  - Biometry: at least 2 measurements of each
    - Use average if all adequate, otherwise choose best
  - Provide AUA based on biometry

**BUT IF Biometry <= 13 weeks 6 days, ADD** CRL

- Provide 2 separate AUA: Do NOT average CRL and Biometry
  - (1) AUA for CRL
  - (2) AUA for Biometry

**Limited Fetal Anatomy (for all indications, including orders for BPP):**

- Document heart, stomach, renal region & bladder (*including* color to show 2 umbilical arteries)
- Document any requested specific anatomy

**Biophysical Profile (BPP), if requested:**

- Each section is scored 0 or 2 for a total of 8 points possible
- If BPP is less than 8 out of 8, radiologist should be notified
-Entire "limited/follow-up" protocol (above) should be performed when BPP is ordered, unless otherwise directly advised by radiologist

COMPONENTS, to get points:

- Fetal breathing: At least 1 episode continuing for ≥30 seconds within the 30-minute BPP
- Fetal movement: At least 3 discrete body or limb movements
- Fetal tone: At least 1 or more episodes of active extensions and return to flexion
- Amniotic fluid volume: At least one 2 x 2 cm pocket of fluid

Provide at least 3 CINE for all BPP examinations:

1. Cardiac motion (in addition to M-mode tracing)
2. Breathing
3. Movement and Tone

More CINE images can be provided at the discretion of the technologist.

Maternal anatomy

-Evaluate uterus and adnexa/ovaries

-Do not need to include kidneys unless there is specific indication in order

Best technique for measuring cervical length

-If request is for cervical length in addition to anatomy, use TV technique unless otherwise specified by ordering clinician (or discussed with radiologist).

-If cervical length is abnormal on transabdominal exam, add TV to evaluate. Discuss with radiologist if unsure.

For most accuracy:

1. Empty maternal bladder
- Full/partially full bladder = falsely elongates cervix

2. Zoom-in: cervix should take up 75% of image
   - Entire canal should be seen on 1 image

3. Be careful with transducer pressure: anterior thickness of cervix should be same as posterior thickness
   - Anterior echogenicity should be same as posterior echogenicity
   - Too much pressure = falsely elongates cervix

4. Ensure measurement is from internal os (not membrane) to external os (not vaginal wall)
   - Take 3 measurements

5. When curved: do NOT trace, use 2 (or more) LINEAR measurements
   - Report shortest measurement with best technique

6. If shortened and patient is in triage/L & D, assess for funneling: apply gentle fundal pressure for 15 seconds and observe for funneling. This should not be done for routine outpatients.

7. Always provide an image with color to document presence/absence of overlying umbilical vessels

**UMBILICAL ARTERY DOPPLER – S/D RATIO TABLE**
- Normal is < 95%-tile
- These values correspond to mid-cord measurements