

TRA-MINW

OB 2nd & 3rd Trimester Follow-up & Limited Protocols

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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; 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

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(2) AFI specifically requested

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

-At \geq 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 \leq 5 cm (singleton)

-Single deepest vertical pocket \leq 2cm (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 (\leq 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:

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-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: 4 total spectral tracings = 2 of each umbilical artery

-Each umbilical artery should be sampled at **both fetal insertion and placental origin**

-NOTE: If unable to get adequate tracings for both umbilical arteries or there is a 2-vessel cord, provide additional 3rd spectral tracing of the one that is visible

-Additional tracings can be acquired as necessary

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-Range of S/D ratios (*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)

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

-At LMP/provided dating \leq 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 \geq 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 \geq 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 \leq 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:

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- 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

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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

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| Gestation (wk) | Percentile | | | | | | | | |
|----------------|------------|------|------|------|------|------|------|------|--------|
| | 2.5th | 5th | 10th | 25th | 50th | 75th | 90th | 95th | 97.5th |
| 19 | 2.73 | 2.93 | 3.19 | 3.67 | 4.28 | 5.00 | 5.75 | 6.26 | 6.73 |
| 20 | 2.63 | 2.83 | 3.07 | 3.53 | 4.11 | 4.80 | 5.51 | 5.99 | 6.43 |
| 21 | 2.51 | 2.70 | 2.93 | 3.36 | 3.91 | 4.55 | 5.22 | 5.67 | 6.09 |
| 22 | 2.43 | 2.60 | 2.83 | 3.24 | 3.77 | 4.38 | 5.03 | 5.45 | 5.85 |
| 23 | 2.34 | 2.51 | 2.72 | 3.11 | 3.62 | 4.21 | 4.82 | 5.22 | 5.61 |
| 24 | 2.25 | 2.41 | 2.62 | 2.99 | 3.48 | 4.04 | 4.63 | 5.02 | 5.38 |
| 25 | 2.17 | 2.33 | 2.52 | 2.88 | 3.35 | 3.89 | 4.45 | 4.83 | 5.18 |
| 26 | 2.09 | 2.24 | 2.43 | 2.78 | 3.23 | 3.75 | 4.30 | 4.66 | 5.00 |
| 27 | 2.02 | 2.17 | 2.35 | 2.69 | 3.12 | 3.63 | 4.15 | 4.50 | 4.83 |
| 28 | 1.95 | 2.09 | 2.27 | 2.60 | 3.02 | 3.51 | 4.02 | 4.36 | 4.67 |
| 29 | 1.89 | 2.03 | 2.20 | 2.52 | 2.92 | 3.40 | 3.89 | 4.22 | 4.53 |
| 30 | 1.83 | 1.96 | 2.13 | 2.44 | 2.83 | 3.30 | 3.78 | 4.10 | 4.40 |
| 31 | 1.77 | 1.90 | 2.06 | 2.36 | 2.75 | 3.20 | 3.67 | 3.98 | 4.27 |
| 32 | 1.71 | 1.84 | 2.00 | 2.29 | 2.67 | 3.11 | 3.57 | 3.87 | 4.16 |
| 33 | 1.66 | 1.79 | 1.94 | 2.23 | 2.60 | 3.03 | 3.48 | 3.77 | 4.06 |
| 34 | 1.61 | 1.73 | 1.88 | 2.16 | 2.53 | 2.95 | 3.39 | 3.68 | 3.96 |
| 35 | 1.57 | 1.68 | 1.83 | 2.11 | 2.46 | 2.87 | 3.30 | 3.59 | 3.86 |
| 36 | 1.52 | 1.64 | 1.78 | 2.05 | 2.40 | 2.80 | 3.23 | 3.51 | 3.78 |
| 37 | 1.48 | 1.59 | 1.73 | 2.00 | 2.34 | 2.74 | 3.15 | 3.43 | 3.69 |
| 38 | 1.44 | 1.55 | 1.69 | 1.95 | 2.28 | 2.67 | 3.08 | 3.36 | 3.62 |
| 39 | 1.40 | 1.51 | 1.64 | 1.90 | 2.23 | 2.61 | 3.02 | 3.29 | 3.54 |
| 40 | 1.36 | 1.47 | 1.60 | 1.85 | 2.18 | 2.56 | 2.96 | 3.22 | 3.48 |
| 41 | 1.33 | 1.43 | 1.56 | 1.81 | 2.13 | 2.50 | 2.90 | 3.16 | 3.41 |

From Acharya G, Wilgaard T, Bernsten GKR, et al: Reference ranges for serial measurements of umbilical artery Doppler indices in the second half of pregnancy. Am J Obstet Gynecol 192:937, 2005