

ANTEPARTUM FETAL SURVEILLANCE

The goal of antepartum fetal surveillance is the reduction of fetal demise or progressive morbidity in populations at high risk for these complications.

Daily fetal movement assessment is encouraged in all viable pregnancies beginning at 28 weeks of gestation.

A. Indications, Frequency, and Timing for Antepartum Fetal Surveillance Testing:

- For most indications, antepartum fetal surveillance in the outpatient setting is performed at baseline as twice weekly with alternating NSTs and BPPs.
 - However, some indications have alternate testing. See Table A
 - Frequency and timing can be altered either more or less frequently based on stability of maternal/fetal condition after consultation with maternal fetal medicine
- In most instances, testing is initiated at **32 wks** of gestation.
 - Exceptions which may warrant earlier testing include **FGR and pre-eclampsia** - Initiated at time of diagnosis in a potentially viable pregnancy
 - **History of unexplained third trimester fetal demise** - Initiated 2 weeks prior to gestational age of previous demise or at 32 weeks, whichever is earlier
 - Some indications warrant later onset testing, see bottom section of Table A.
- Other uncommon indications for early fetal surveillance may exist. These should be considered on a case-by-case basis in consultation with a Maternal-Fetal Medicine specialist.
- Isolated episodic decreased fetal movement in an otherwise low risk patient may be evaluated by a single (one time) NST or a BPP

Table A: Summarized Indications and Usually Recommended Testing Frequency

Indication	Frequency	Test
Decreased fetal movement (one-time indication if symptoms resolve)	Episodic	BPP or NST
All following indications: Twice weekly testing with alternating BPP and NST		
Monochorionic diamniotic twins		
Chronic hypertension requiring antihypertensive therapy		
Gestational age ≥41 wks		
Preeclampsia (initiate at diagnosis)		
Gestational Hypertension (initiate at diagnosis)		
A2 gestational diabetes mellitus		
Pregestational diabetes mellitus		
Systemic lupus erythematosus/antiphospholipid syndrome		
Renal disease with creatinine >1.4		
Thyroid disease with poor control		
Polysubstance abuse		
Previous unexplained 3 rd trimester fetal demise		
Fetal growth restriction (initiate at diagnosis per FGR protocol)		
Sickle cell anemia		

Polyhydramnios (DVP >8cm and/or AFI >24 cm) (see Amniotic Fluid Disorders Protocol)
Oligohydramnios with DVP <2 cm or AFI <5 cm (initiate at diagnosis)
Intrahepatic cholestasis of pregnancy (initiate at diagnosis)
Trisomy 21 per maternal counseling
Maternal pulmonary disease with hypoxia or cyanosis (frequency may be individualized)
Placental abruption and/or unexplained third trimester bleeding
Red blood cell alloimmunization
Certain specific fetal anomalies (ie CDH, gastroschisis, etc)
Twin to twin transfusion syndrome (may initiate prior to 32 weeks)
All following indications: Twice weekly testing with BPPs
Monochorionic diamniotic twins
All following indications: Weekly testing with BPP
Initiate at 32 weeks Maternal cyanotic heart disease Chronic hypertension, well controlled without anti-HTN therapy
Initiate at 34 weeks Obesity with BMI ≥ 40 Advanced maternal age 35 or older
Initiate at 36 weeks Abnormal serum markers, PAPP-A ≤ 0.4 , AFP ≥ 2.5 or inhibin ≥ 2 Dichorionic twins without other associated complications
Initiate at 37 weeks BMI 35-39.9

Abbreviation definitions:

BPP = BPP sans NST unless NST is needed because BPP sans NST is 6/8

BPP with NST = BPP and NST together at each testing event

Episodic = one time only

The following may be indications for inpatient monitoring:

- Fetal growth restriction with absent or reversed end diastolic flow
- Monoamniotic twins (individualized following MFM consultation)
- Preeclampsia with severe features
- Select women with preeclampsia without severe features
- Oligohydramnios with DVP <2 cm and/or AFI <5 cm
- Vasa previa
- Chronic hypertension with poor control

For uniformity in care, testing is recommended as above. However, individual variation may be necessary because of appropriate application of medical judgement – rationale is to be documented as outlined. The following may be indications for ANFS with frequency and timing of initiation individualized according to the disease process and stability:

- Triplet gestation (or even higher order multiples)
- Monoamniotic twins (may be candidates for inpatient monitoring)
- Fetal anomalies or aneuploidy
- Sickle cell anemia with complications (initiate at diagnosis, frequency individualized)
- Other hemoglobinopathies

- Vasa previa (may be candidates for inpatient monitoring)

C. Testing Modalities

Patient Positioning for NST, BPP and Doppler Testing:

All patients undergoing NST, BPP and or Doppler testing are to be positioned with **left lateral positioning** (towel roll under the right buttock) so as to reduce the possibility of maternal great vessel compression (with resulting reduction of uteroplacental blood flow)

NST:

- Reactive non-stress test (≥ 32 0/7 weeks):
 - The presence of two or more accelerations in a 20 minute time window (15 bpm peak above baseline FHR with a total acceleration duration of > 15 second with or without fetal movement)
- Reactive non-stress test (<32 0/7 weeks):
 - the presence of two or more accelerations in a 20 minute time window (10 bpm peak above baseline FHR with a total acceleration duration of > 10 second with or without fetal movement)

Biophysical Profile (BPP):

- The standard testing interval is up to 30 minutes.
- Unless specified in **special circumstances**, the NST component of the BPP is omitted provided the remaining parameters are all scored as 2 points (“BPP 8/8 sans NST”)

BPP scoring scale		
BPP component	Criteria	Possible points
Fetal breathing movement (FBM)	≥ 1 episode of rhythmic fetal breathing lasting ≥ 30 seconds	2 points
Fetal movement (FM)	≥ 3 discrete body movements and/or limb movements	2 points
Fetal tone (FT)	≥ 1 episode of flexion and extension of a fetal extremity or opening and closing of a fetal hand	2 points
Amniotic fluid volume (AF)	2 x 2 cm pocket of fluid*	2 points
NST	Reactive	2 points

*Multiple gestations – Use deepest vertical pocket modification (DVP >2.0 cm = 2 points)

Score of 8/8 (sans NST) or 10/10 (if NST included) = Reassuring

Score of 6/8 (sans NST) → Necessitates NST evaluation in a timely fashion

Score of 6/10 (NST included) = Equivocal

Necessitates further evaluation of fetal wellbeing

Score of 4 or less = Nonreassuring

Consider delivery depending on the gestational age and maternal/fetal condition

If not delivered, continued evaluation of fetal status is necessary

Deepest Vertical Pocket (DVP) in Multiple Gestation:

Measurement consists of deepest single vertical pocket of amniotic fluid in each amniotic sac

DVP < 2.0 cm = Oligohydramnios (necessitates additional evaluation)
DVP ≥ 8.0 cm = Polyhydramnios (necessitates additional evaluation)

D. Which Test to Perform? (See Table B for Summary of Recommendations):

Choice of testing modality:

Many tests of fetal well-being are available and none is universally superior to the others. Our approach in the application of fetal surveillance is to implement appropriate testing modalities in a cost-effective manner while minimizing complications secondary to false positive results and the possibility of iatrogenic prematurity.

- Daily fetal movement assessment- All patients undergoing antenatal testing should be encouraged to monitor fetal movement (**See Attachment A**)
- Doppler velocimetry- Not routinely used in the majority of patients (Please see FGR Doppler Protocol for specific indications)

Special circumstances (See also Table B):

- Women with pregestational diabetes mellitus and gestational diabetes mellitus requiring medical treatment are tested twice per week
 - Alternate BPP and NST so testing is performed optimally every 3-4 days
 - Specific modification in patients with longstanding disease, maternal vascular morbidity or poor compliance may necessitate individual modification of testing regimen
- Fetal Care patients with fetal anomalies- Twice weekly testing with alternating BPP and NST
- Oligohydramnios or Polyhydramnios
 - Refer to Amniotic Fluid Disorders Protocol for specific management

Fetal growth restriction (FGR):

FGR management is specialized and situation dependent. Please refer to FGR protocol for specific management. Standard testing for FGR diagnosis consists of alternating BPP and NST testing minimally twice per week with Doppler testing as per protocol and/or case dependent.

E. Test Interpretation and Follow Up

BPP:

- Value of 6/8 necessitates NST performance
 - BPP score inclusive of reactive NST of 8/10 = Continue current surveillance timing
 - BPP score inclusive of nonreactive NST of 6/10 = MD review with specific follow up plan
- Value of ≤ 4/10 is indicative of the need for ongoing fetal monitoring and expedited MFM consultation for recommendations regarding delivery or specifically directed care as clinically appropriate.

NST:

- Nonreactive NST necessitates performance of BPP (BPP with NST)
 - Score of 8/10 = Continue current surveillance
 - Score of 6/10 = MD review with specific follow up plan
- Nonreactive NST with immediately nonreassuring fetal heart activity pattern necessitates timely follow up as clinically indicated.

Fetal Growth:

- In general, patients undergoing antenatal fetal surveillance should concurrently be monitored for fetal growth abnormalities. We recommend that follow-up fetal growth surveys be completed at 4 week intervals in patients undergoing testing for the duration of their pregnancy.

F. Guideline Deviations:

Outpatient testing will be performed for the above indications in the above manner. Deviations from testing regimen are to be documented and handled in the following fashion:

- Testing ordered for non-listed indications or for non-recommended frequency require a faculty (attending) MD note with indication, rationale and duration of testing to be performed
 - Faxed with paper orders from Non-EMR provider office
 - Placed in EPIC for applicable patients
- Since testing is ordered on patients at increased risk for adverse events, non-faculty MD providers (health department clinics, fellows, residents, or mid-level providers) wishing to order testing outside of practice guideline need one of the following to order variation in guideline testing:
 - Approval by MFM ultrasound faculty or fellow
 - Approval by MFM OB clinic preceptor
 - Approval by MFM faculty or fellow on duty in hospital (504-6099)
 - Attending (non-MFM) MD preceptor) or practice faculty physician consultant (health department clinics, mid-level provider clinics, etc)
- MFM faculty may find it necessary to modify testing regimen for individual care of a given patient (substitution of NST for episodic BPP event, recommend testing on a more frequent basis than guideline specifies, etc). If this occurs, MFM faculty (or fellow in conjunction with faculty) is to outline modified regimen and basis of plan modification.

Patients with variant scheduling without the above documentation will receive the testing on the initial date of testing. Testing report will be sent to provider with instructions to review the indication and specify testing as appropriate. Patients will be instructed to contact their provider office or clinic for clarification of testing regimen. **Subsequent dates of testing will not be performed without provider follow up and affirmation as outlined above.** Repeated scheduling of unclear or non-justified variations in care will be handled by having the patient evaluated that day by the ordering provider or covering colleague so testing plan may be clarified for the best timely care of the patient.

G. Inpatient recommendations:

- Default to daily NSTs and twice weekly BPPs
- Recommend continued monitoring of fetal movement

UC HEALTH MATERNAL-FETAL MEDICINE

Fetal Movement Monitoring Chart

Date	Time Started	Kicks/Movements	Time Completed

- Instructions:
- 1) Lie on left side in a quiet room at the same time every day
 - 2) Write down the time you are starting
 - 3) Make a mark for every movement, kick or roll
 - 4) Write down the time when you feel the 10th movement
 - 5) Call your doctor or provider or contact labor and delivery (513-584-3999) if:
 - a. You haven't marked 10 movements in 1 hours
 - b. The movement is decreased in frequency compared to previous days