OBJECTIVE
This guideline provides a consistent approach to fetal surveillance and utilization of various methods of antenatal testing and surveillance.

GUIDELINES
Antenatal testing will generally begin @ 32 weeks and consist of twice weekly NST testing and weekly Amniotic Fluid Index.
Note: There are times when a weekly BPP is offered (antenatal testing starting before 32 weeks, holiday schedule, consistent non-reactive NST due to maternal medications, e.g. Beta blocker, methadone etc.)

DEFINITIONS
Antepartum testing: Assessments that may include the use of maternal self-monitoring, electronic fetal monitoring, vibroacoustic stimulation, and/or ultrasound to assess various indicators of fetal well-being.
Fetal Movement Assessment (fetal kick counts): Fetal assessment via recording of fetal movement by the mother.
Amniotic Fluid Index (AFI): A semi-quantitative technique use to evaluate amniotic fluid volume
Biophysical Profile (BPP): The combined observation of four separate fetal biophysical variables (fetal breathing movements, fetal body movement, fetal tone, amniotic fluid index) obtained via ultrasound and a fifth component of fetal reactivity evaluated via a non-stress test using electronic fetal monitoring.
Non-stress Test (NST): The non-stress test is an antepartum surveillance test for evaluation of the fetal heart rate pattern in the absence of regular uterine contractions to determine fetal oxygenation, neurologic and cardiac function.
Vibroacoustic Stimulation (VAS): A non-invasive method of evoking a reactive NST in fetuses found to be in a low activity state via a device that emits vibration and sound.

INDICATIONS
Any patient who has a fetus with an increased risk of fetal morbidity/mortality will have antenatal testing and enhanced fetal surveillance. **Note: List is suggestive, not all inclusive.

- Maternal Conditions
  1. Diabetes
  2. AMA
  3. Chronic hypertension
  4. Renal disease
  5. Cardiac disease
  6. History of clinically significant thrombophilia or risk of placental thrombosis, venous thrombosis event or current thrombosis concern
  7. Pulmonary disease (including active asthma)
  8. Medications:
     i. Active illicit drug use
     ii. Opioid use – **only if growth restricted
iii. Note: Consider weekly BPP if consistent non-reactive NST due to maternal medications, e.g. Beta blocker, methadone etc.

- Fetal Complications
  1. Anomalies (gastroschisis, congenital diaphragmatic hernia, spina bifida, hydrops, etc)
  2. Multiple gestations
    - Dichorionic/Diamniotic – test only if fetal weight or amniotic fluid discordance >20%
    - Monochorionic/ Diamniotic – Begin testing at 34 weeks
      - IF fetal weight or amniotic fluid discordance >20%, initiate antenatal testing (twice weekly NST, weekly AFI) at 32 weeks
  3. IUGR (<10th percentile)
  4. Gestation beyond 41 weeks

- Pregnancy Complications
  1. Mild PIH/Preeclampsia
  2. Oligohydramnios (AFI <7)
  3. Prior IUFD >26 weeks (start testing either one week prior to demise gestational age or at 32 weeks, whichever is first)
I. Methods of Fetal Surveillance
   A. Fetal Movement Assessment (fetal kick counts)
      See Appendix A for Kick Count Patient Instruction Sheet

   B. Non Stress Test (NST)
      Criteria for interpretation of NST
      **Reactive:** The occurrence of two or more accelerations, each rising to \( \geq 15 \text{bpm} \) above the baseline FHR and lasting for a period of \( \geq 15 \text{ seconds} \), achieved within a 20-minute time frame (< 32 weeks: 10 bpm for 10 seconds).

      **Non-reactive:** Failure to meet reactive criteria; less than 2 accelerations or accelerations less than 15 bpm peak amplitude or accelerations less than 15 seconds duration in 20 minutes; baseline rate may
be outside or within the normal range.

Procedure:
1. Gather needed equipment including an electronic fetal monitor, external transducers (ultrasound; tocodynamometer), activate the patient on the OBTV monitoring system
2. Explain procedure of test and reinforce provider’s rationale for the test as needed. Provide NST handout as needed. (See Appendix B)
3. Position the patient in right or left lateral recumbent or semi-fowler’s position to maximize uterine blood flow (supine position decreases uteroplacental blood flow).
4. Note - The NST is based on the absence/presence of accelerations and not the absence/presence of fetal movement. Therefore you do NOT need to give a patient a button to designate movement.
5. Obtain Blood pressure, Heart Rate, temperature. Review maternal medications. Document status of vaginal bleeding, leaking of fluid or contractions.
6. Document additional patient assessments as indicated by patient condition. Blood pressure is re-taken if the initial finding is different from the patient baseline blood pressure.
7. Apply the external transducers. The tocodynamometer is applied to record any spontaneous contractions the patient may have; this information may be important should periodic fetal heart rate changes be present. Note: Differentiate maternal from fetal heart rate by simultaneously assessing maternal heart rate while observing/counting fetal heart rate.
8. Obtain a good quality fetal monitor strip with no interruptions in fetal heart rate tracing if possible.
9. If no reactivity by 10-20 minutes, proceed to VAS (below) and continue the test for 20 more minutes. If no VAS performed, monitor for 40 minutes maximum.
10. If NST nonreactive, patient will be scheduled for a Biophysical Profile (BPP) that day. Notify attending MFM of non-reactive NST and follow up initiated.
11. Take the patient off the monitor when the test is complete.
12. Review labor precautions as needed with patient. (See Appendix C)
13. Review the NST with additional providers as needed prior to patient discharge.
15. Place all monitoring strips in the appropriate location for review by attending MFM.

C. Vibroacoustic Stimulation (VAS)
VAS may be used to obtain reactive NSTs in fetuses who are found to be in a low activity state. Reactivity evoked by VAS is as reliable as that occurring spontaneously. Small variable decelerations occurring immediately after VAS are quite common and non-pathologic.

Procedure:
1. After at least 10-20 minutes of non-reactivity stimulate the fetus through the maternal abdomen near the fetal head. Note: Stimulate only after a baseline fetal heart rate obtained. Do not stimulate during a contraction or heart rate deceleration. (Menihan, C., Kopel, E. Electronic Fetal Monitoring: Concepts and Applications. Second Edition. 2008. Pg. 72-73.)
2. Stimulate for 1 second and wait 1 minute
3. If the fetus remains non-reactive, acoustic stimulation may be repeated at 1-minute intervals up to three times, progressively increasing the stimuli time to 3 seconds.
4. Document VAS in OBTV and impression progress note
5. Failure to become reactive requires further evaluation (BPP)

D. Biophysical Profile (BPP)

A biophysical profile is the combined observation of five separate biophysical variables: movement, tone, reactivity, breathing, and amniotic fluid volume (Manning, Morrison, Lange, & Harman, 1985).

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>NORMAL (Score = 2)</th>
<th>ABNORMAL (Score = 0)</th>
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<tbody>
<tr>
<td>a) Fetal Breathing Movements (FBM)</td>
<td>1 episode of FBMs (or hiccoughs) of 30 seconds duration</td>
<td>&lt; 30 seconds of sustained FBMs</td>
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<td>b) Fetal Movements (FM)</td>
<td>3 discrete body/limb movements (simultaneous limb and trunk movements are counted as a single movement)</td>
<td>&lt; 2 episodes of FMs</td>
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<tr>
<td>c) Fetal Tone</td>
<td>1 episode of active extension with rapid return to flexion of fetal limb(s), trunk, or hand</td>
<td>Either slow extension with return to partial flexion or movement of limb in full extension or absent fetal movement</td>
</tr>
<tr>
<td>d) Reactive Fetal Heart Rate (FHR)</td>
<td>2 accelerations of 15 bpm peak amplitude lasting 15 seconds at the baseline within 20 minutes</td>
<td>&lt; 2 accelerations or accelerations &lt; 15 bpm peak amplitude or accelerations &lt; 15 seconds duration in 20 minutes</td>
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REFERENCES


Obstetrics Guidelines


Appendix A

KICK COUNTS

Kick Counts:

What Are Kick Counts?
Counting your baby’s movements or “kick counts” is a way of monitoring your baby’s activity. Doing kick counts is one way to monitor how your baby is doing. They are simple to do.

When Do I Count?
Plan to do kick counts each day at a time you know the baby is usually active. This may be after a meal or perhaps in the evening around bedtime. By choosing a time when the baby is usually active, doing kick counts will not take long at all. You know better than anyone else when your baby is active, and you can decide the best and most convenient time to count the baby’s movements.
Each day, count eight movements and record the beginning and ending times of the counting periods. Or, you may decide to count all movements during a set length of time each day (for example, one-half hour). Whichever you choose, you should do the same thing each day.

**How Do I Count Kicks?**
You will need the following:
- A clock or watch
- A lounge chair, bed or couch
- A recording sheet and pencil

Lie on your side for the counting period. Place one or both hands on your stomach over the baby. Count each time the baby moves on his own, such as kicks, rolls, punches, turns or stretches. Do not count hiccups or movements the baby makes if you push against him/her.

**How Do I Know The Counts Are Okay?**
Having at least eight movements in two hours is best. It is important to contact your doctor at once if you have less than eight, regardless of the time of day or night. A low kick count may be a sign that the baby is having problems, so your doctor/midwife will want to see you.

**How Do I Record My Counts?**
On the back of this sheet is a place to write the date and the beginning and ending times of the counting periods, and the number of kicks. Also, record any special comments about the counting period (if the baby has hiccups or if you fall asleep). Be sure to bring the record with you to each clinic visit. It will become an important part of the information about your baby during the prenatal period.

If your baby does not move eight times in two hours, or if you have any questions or concerns, call your doctor/midwife any time during the day or night. You may also call Triage in the Meriter Birthing Center at (608) 417-6228.

### Fetal Movement Count Recording

<table>
<thead>
<tr>
<th>Date</th>
<th>Starting Time</th>
<th>Ending Time</th>
<th>Number of Movements</th>
<th>Remarks</th>
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You have been scheduled to have a non-stress test (NST). The purpose of this test is to check the health of your placenta, which supplies oxygen and nutrients to your baby. When your baby moves we expect to see its heart rate increase, which will be observed and recorded by the fetal monitor.

During the non-stress test you will lie down in bed or sit in a recliner. Two belts will be placed around your abdomen, and attached to two separate recording devices. One device will monitor and record if you are having any uterine contractions. The second device will continuously record your baby’s heart rate. Your nurse will explain how the fetal monitor works and where on the monitor to look for the recording of both uterine contractions and the baby’s heart rate.
Once the recording device is on your abdomen the monitor will begin recording. Ideally, your baby should increase its heart rate 15 beats per minute above its resting heart rate for at least 15 seconds. This needs to occur twice in 20 minutes. If your baby does this, the test is read by the doctor as reactive. Sometimes the test may take longer than 20 minutes. Babies have natural sleep cycles so the test may be extended for 40 minutes to allow the baby to wake up from its nap and begin moving.

If after 40 minutes the baby does not meet the recommendations, another test (Biophysical Profile or BPP) will be performed. This provides additional information about the health of your baby. An ultrasound machine will be used to take a closer look at your baby. The ultrasound machine will watch for movements and breathing. If this test is required, it may take up to an additional 30 minutes.

The ultrasound machine may also be used to measure the amount of fluid around the baby. This measurement is called an amniotic fluid index or an AFI.

There is no way to predict if your NST will be reactive or if you will need additional testing. If your baby requires the additional test (BPP), don’t be concerned. Sometimes your NST is scheduled at a time of day when your baby is typically not active.

Here are a few suggestions to help your test time go more smoothly:

1. Eat your breakfast, lunch or snack as usual or bring it with you if your appointment is scheduled during your usual meal time.
2. If you are a smoker, you are encouraged not to smoke for at least 60 minutes before the test. Smoking reduces the amount of oxygen available to your baby and makes it more difficult for the baby to increase its heart rate.
3. If you are testing your blood sugars or blood pressure at home, bring your records with you.
4. Attempt to make your appointment time when your baby is usually active.

Appendix C

Labor: When To Call Your Provider and/or Come To the Hospital

The information provided is to help you understand the differences between true labor, false labor and preterm labor. In addition, conditions that require immediate medical evaluation in the hospital are listed.

When You Require Immediate Evaluation - come to the hospital

- Bag of waters (membranes) breaks. Even if contractions are not present, you will need to be evaluated in the hospital. A “gush” of fluid or a steady trickle that you can’t control are both signs that your water has broken. Fluid may be clear, yellow, green or pink tinged.
- Constant, severe abdominal pain.
- Bright red vaginal bleeding, like a period.
- Constant rectal pressure.
• Decreased baby movement or less than eight movements in two hours.
• Continued or severe headache.
• Blurred vision or spots before your eyes.
• Chills or fever.
• Fainting spell or loss of consciousness.
• Severe or continued nausea and/or vomiting.

**True Labor – come to the hospital for evaluation**
- Contractions occur at regular times.
- With your first delivery, when contractions are 5 minutes apart or closer for 1 hour.
- If you have had a baby before, when contractions are 6-8 minutes apart for 1 hour.
- Time between contractions becomes shorter.
- Discomfort increases; difficulty walking or talking through contractions.
- Contractions are stronger when walking and do not subside when resting.
- Bloody discharge (show) from your vagina.
- Rectal pressure; feeling as if you need to have a bowel movement.

**Timing Contractions:**
1. How often (frequency) – **time in minutes** from the beginning of one contraction to the beginning of the next contraction.
2. How long (duration) – **time in seconds** the length of the contraction from beginning to end.

**False Labor – call provider or Triage with questions**
- Contractions may be regular or irregular (come and go) but do not get stronger.
- Contractions subside or are less frequent when resting.
- Time between the contractions remains the same or contractions become further apart.
- No cervical change when examined by a doctor or nurse.

**Preterm Labor – come to the hospital for evaluation**
(Labor that begins more than 3 weeks before your due date)
- Menstrual-like cramps, stomach feels like it's “balling up”.
- Pelvic pressure.
- Low backache.
- A new vaginal discharge or any increase in vaginal discharge, especially if red or pink.
- Pains/cramps every 10 minutes or less that do not subside with rest, drinking fluids or after emptying your bladder.

If you are coming to the hospital to be evaluated, please call Birthing Center Triage (608) 417-6228 so that we can be prepared for your arrival and provide you with directions or answer any questions.

If you have any questions after you leave the hospital, you may call Birthing Center Triage at (608) 417-6228, or you may call your primary OB provider.