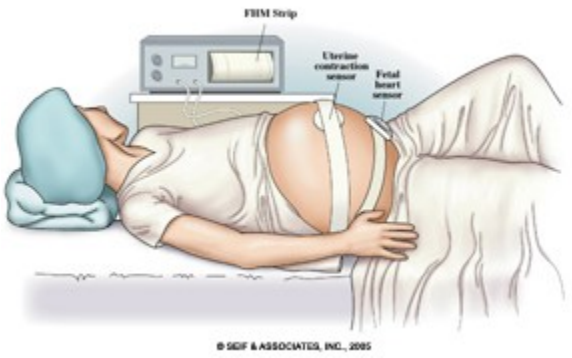
Fetal Monitoring
(How Your Baby Is Doing)

Monitoring your baby (*fetus*) before birth helps your caregiver see problems in advance. Identifying and correcting such problems could prevent serious problems to the fetus, even fetal loss. Caregivers have used such techniques based on measurement of fetal heart rate patterns for a very long time. Also, monitoring techniques determine the risk of fetal problems in pregnancies complicated by the mother's medical problems.



Below are techniques of monitoring your baby before birth.

FETAL MOVEMENT ASSESSMENT

Sometimes, a mother notices her baby moves less before there are problems. Because of this, it is believed that fetal movement checking by the mother (*kick counts*) is a good way to check the baby before birth.

There are different ways of doing this. Two good ways are:

- The woman lies on her side and counts distinct (individual) fetal movements. A feeling of 10 distinct movements in a period of up to 2 hours is considered reassuring. When 10 movements are felt, you may stop counting.
- Women are instructed to count fetal movements for 1 hour, three times per week. The count is good if, after one week, it equals or is over the woman's previously established baseline count. If the count is lower, further checking of your baby is needed.

CONTRACTION STRESS TEST

The patient lies down on her left side. An external monitor is placed on her abdomen over the uterus. This monitor follows the fetal heart rate during and after a contraction of the uterus. If the uterus contracts 3 times for 40 seconds within 10 minutes, no stimulation of the uterus is necessary. If the uterus needs to be stimulated to get contractions, it may be done by stimulating the nipple of the breasts or by using very small and dilute amounts of a drug that starts or improves contractions. This drug is given through the vein (*intravenously*).

Results of the contraction stress test

The CST is based on the fetal heart rate responding to uterine contractions. It relies on the idea that the amount of oxygen your baby is getting will be less when the womb (*uterus*) contracts. During this time, the fetus may not get enough oxygen. This leads to the heart slowing down. Uterine contractions also may start a pattern of up-and-down decelerations caused by umbilical cord compression. The results of the CST can be:

- Negative. This means there is not an abnormal fetal heart rate or dropping of the heart rate (*decelerations*).
- Positive. This means there is an abnormal fetal heart rate (decelerations following a contraction 50% or more of the time).
- Equivocal-suspicious. This means there are intermittent decelerations after a contraction or significant variable decelerations.
- Equivocal-hyperstimulation. This means the fetal heart rate decelerations that occur with a contraction are more often than every 2 minutes and last longer than 90 seconds.
- Unsatisfactory. This means there are fewer than 3 contractions in 10 minutes or the tracing is unreadable.

Reasons not to perform this test include:

- Preterm labor or patients at high risk of preterm labor.

- Rupture of the membranes before 37 weeks (*preterm membrane rupture*).
- History of uterine surgery or classical cesarean delivery.
- The placenta has grown low or covers the opening of the cervix in the uterus (*placenta previa*).

NONSTRESS TEST

The NST is based on the idea that the heart rate of a normal baby will speed up while the baby is moving around. This is an indicator of a normal working pregnancy. Loss of movement is seen commonly while the baby is sleeping or if there are problems in the pregnancy. Smoking may hurt test results.

- With the patient lying on her side, the fetal heart rate is checked with an electrode on the belly.
- The line drawn from a recording instrument (*tracing*) is observed for fetal heart rate accelerations that speed up at least 15 beats per minute above resting, and last 15 seconds. Tracings of 40 minutes or longer may be necessary.
- Sound stimulation of the healthy fetus may speed up a baby's heart. This also means the baby is healthy. Stimulation helps to reduce testing time and helps find problems in the pregnancy if there is any. To do this, an artificial voice box is put on the mother's belly for about 12 seconds. This may be repeated up to 3 times for progressively longer durations.
- Results are categorized as normal (*reactive*) or abnormal (*nonreactive*). Commonly, the NST is considered normal (*reactive*) if there are 2 or more fetal heart rate accelerations as described inside a 20-minute period. This is with or without fetal movement the mother feels. A nonreactive NST is one that does not have enough fetal heart rate accelerations over a 40 minute period.
- Abnormal testing may need further testing.

It should be noted also that:

- The NST can be nonreactive 50% of the time in weeks 24 to 28 of a normal pregnancy.
- The NST can be nonreactive 15% of the time in weeks 28 to 32 of a normal pregnancy.
- Lower fetal heart rate (*decelerations*) may be seen in 50% of NST's. However, if they are consistent (3 in 20 minutes), it increases the risk for Cesarean section.
- Decelerations of the fetal heart rate that last for one minute or longer indicates a very serious problem with the baby. A Cesarean section may be needed right away.

BIOPHYSICAL PROFILE

The BPP contains five parts:

- The nonstress test.
- The baby's breathing.
- The baby's movements.
- The baby's muscle tone.
- Measuring the amount of the amniotic fluid.

Each of the five test parts is assigned a score of either 2 (normal) or 0 (abnormal). A combined score of 8 or 10 is normal, a score of 6 could go either way, and a score of 4 or less is abnormal.

No matter what the final score of the BPP is, if the amniotic fluid volume is 2 centimeters or less, further studies and evaluation of the baby should take place.

MODIFIED BIOPHYSICAL PROFILE

In the late second or third trimester, amniotic fluid can show fetal urine production. A problem with the working of the placenta may result in less fetal urination. This leads to less amniotic fluid, which the baby floats in within the womb. Determining the amount of amniotic fluid can be used to evaluate long-term uteroplacental function. This test is called the "modified BPP."

The modified BPP combines the nonstress test (with the option of acoustic stimulation), with the amniotic fluid index (AFI). AFI is an indicator of long-term placental function. Acoustic stimulation is a loud noise sounded

over the abdomen into the uterus to stimulate or wake up the fetus. The loud noise is applied for 1 to 2 seconds, 3 to 4 times, to speed up the baby's heart rate. An AFI greater than 5 cm generally is considered to represent an adequate volume of amniotic fluid. Thus, the modified BPP is considered:

- Normal if the NST is reactive and the AFI is more than 5 cm
- Abnormal if either the NST is nonreactive or the AFI is 5 cm or less.

UMBILICAL ARTERY DOPPLER VELOCIMETRY

- Doppler ultrasonography is a monitoring procedure that is noninvasive. It can be done with an abdominal or vaginal ultrasound. It is a test that uses sound waves that tell the caregiver about the amount and speed of blood flow in the umbilical cord, as well as the speed and amount of blood flow from the mother to the baby through the umbilical arteries. It also evaluates the condition of the baby in high risk pregnancies.
- Doppler velocimetry is used mainly in IUGR (*intrauterine growth restriction*) pregnancies. When used in this manner, decisions on how to treat the pregnancy should be done with consideration of the findings of the other tests of fetal well-being.

CONCLUSION

There are several very serious problems that cannot be predicted or found with any of the fetal monitoring procedures. These problems include:

- Separation (*abruption*) of the placenta.
- When the fetus chokes on the umbilical cord (*umbilical cord accident*).

Your caregiver will help you understand the test and what it means for you and your baby. It is your responsibility to obtain the results of your test.

Document Released: 12/08/2003 Document Re-Released: 01/09/2011
ExitCare® Patient Information ©2011 ExitCare, LLC.