

PATIENT EDUCATION



The American College of
Obstetricians and Gynecologists
WOMEN'S HEALTH CARE PHYSICIANS

Special Tests for Monitoring Fetal Well-Being

Special tests may be used to check the well-being of the **fetus** during pregnancy. These tests can help reassure you and your health care professional that all is going well. If problems arise, tests can help alert your health care professional that special care is needed.

This pamphlet explains

- why special tests may be needed
- when during pregnancy special tests are performed
- types of special tests
- how the tests are done and what the results mean

Why Special Tests May Be Needed

Special testing during pregnancy most often is done when there is an increased risk of pregnancy complications or **stillbirth**. These tests usually are done for women with high-risk pregnancies. High-risk pregnancies include those in which a woman has had a previous pregnancy with complications or has a pre-existing health condition, such as heart disease, high blood pressure, or **diabetes mellitus**.

A woman's pregnancy can become high risk if certain problems arise during the prenatal period. Some examples of these problems include the following:

- Fetal growth problems
- **Rh sensitization**
- High blood pressure that occurs during pregnancy

Testing also may be started if

- there is decreased movement of the fetus
- your pregnancy goes past 42 weeks (**postterm pregnancy**)
- you have a **multiple pregnancy** with certain complications

A negative test result means that no problems have been found. A positive test result, however, does not necessarily mean that there is a problem. If you have a positive test result, you most likely will have additional tests to find out whether a problem exists.

No test is 100% reliable. Test results may show that there is no problem when one actually exists. This is called a false-negative result. Test results also may show that there is a problem when one does not exist. This is called a false-positive result. It is important to

understand the risks associated with both false-positive results and false-negative results when undergoing these tests.

When Tests Are Performed

Special testing usually is started between 32 weeks and 34 weeks of pregnancy. Testing may be started earlier if problems are particularly serious or there are multiple risk factors.

How often the tests are done depends on the condition that prompted the testing, whether the condition remains stable, and results of the testing. Some tests are repeated weekly. In certain situations, such as diabetes in the mother, postterm pregnancy, fetal growth problems, or some chronic health conditions, tests may be done twice weekly.

Types of Special Tests

The tests used to monitor fetal health include fetal movement counts, nonstress test, biophysical profile, contraction stress test, and *Doppler ultrasound exam* of the umbilical artery.

Fetal Movement Counts

Fetal movement counting (also called “kick counts”) is a test that you can do at home. Your health care professional will tell you how often to do it and when to notify him or her.

Why It Is Done. If you have felt fetal movement less often than what you think is normal, your health care professional may ask you to keep track of the fetus’s movements. When you can feel the same level of movement compared with your previous perceptions of fetal movement, it can be a sign that the fetus is doing well.

How It Is Done. There are different ways kick counts can be done. Your health care professional will give you instructions. One way to do kick counts is to lie on your side and note how long it takes to feel 10 movements. If it takes fewer than 2 hours, the result is considered normal. Once you have felt 10 movements, you can stop counting for that day. This test may be repeated daily.

What the Results May Mean. When you first start doing kick counts, you most likely will receive instructions about when to call your health care professional depending on certain results. If you do not feel enough movement, it does not necessarily mean that there is a problem. It could simply mean that the fetus is sleeping. Additional tests may be needed to find out more information.

Nonstress Test

The nonstress test measures the fetal heart rate in response to fetal movement over a period of time. The term “nonstress” means that during the test, nothing is done to place stress on the fetus.

Why It Is Done. The fetal heart normally beats faster (called an *acceleration*) when the fetus moves. During a nonstress test, the fetal heart rate is recorded. Your health care professional then notes the number of accelerations that occurred during the test period.

How It Is Done. This test may be done in the health care professional’s office or in a hospital. The test is done while you are reclining or lying down and usually takes at least 20 minutes. A belt with a sensor that measures the fetal heart rate is placed around your abdomen. The fetal heart rate is recorded by a machine.

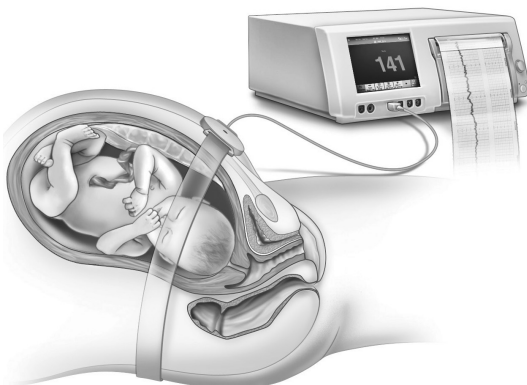
What the Results May Mean. If two or more accelerations occur within a 20-minute period, the result is considered reactive or “reassuring.” A reactive result means that for now, it does not appear that there are any problems. Reactive results are slightly different if the *gestational age* is less than 32 weeks. Sometimes, the fetus may be asleep and will not move two times in 20 minutes. If this happens, the test may last 40 more minutes, or the fetus may be stimulated to move with sound projected over the mother’s abdomen.

A nonreactive result is one in which not enough accelerations are detected in a 40-minute period. It can mean several things. It may mean that the fetus was asleep during the test. It can occur if the woman has taken certain medications. A nonreactive result also can mean that the fetus is not getting enough *oxygen*. A biophysical profile or contraction stress test may be needed to give more information.

Biophysical Profile

A biophysical profile (BPP) may be done when results of other tests are nonreassuring. It uses a scoring system to evaluate fetal well-being.

Electronic Fetal Heart Rate Monitoring



Electronic monitoring of the fetal heart rate is done during the nonstress test, biophysical profile, modified biophysical profile, and contraction stress test.

Why It Is Done. A BPP helps assess fetal well-being in these five areas:

1. Fetal heart rate
2. Fetal breathing movements
3. Fetal body movements
4. Fetal muscle tone
5. Amount of *amniotic fluid*

Each of the five areas is given a score of 0 or 2 points, for a possible total of 10 points.

How It Is Done. A BPP involves monitoring the fetal heart rate (the same way it is done in a nonstress test) as well as an *ultrasound exam*. During an ultrasound exam, a device called a *transducer* is rolled gently over your abdomen while you are reclining or lying down. The transducer creates sound waves that bounce off of the internal structures of the body. The transducer receives these echoes, which are converted into images displayed on a computer screen for the technician to view.

What the Results May Mean. A score of 8–10 is reassuring. A score of 6 is equivocal (neither reassuring nor nonreassuring). If you have an equivocal score, depending on how far along you are in your pregnancy, you may have another BPP within the next 12–24 hours, or it may be decided to deliver the baby. A score of 4 or less means that further testing is needed. Sometimes, it means that the baby should be delivered early or right away.

No matter what the score is, not enough amniotic fluid means that more frequent testing should be done or delivery may need to be considered.

Modified Biophysical Profile

The modified BPP combines a nonstress test with an amniotic fluid assessment that is performed using ultrasound. It is less cumbersome but can be just as useful as the BPP in predicting fetal well-being.

Why It Is Done. This test is done for the same reasons that a BPP is done.

How It Is Done. The fetal heart rate is monitored in the same way it is done for the nonstress test. Ultrasound is used to measure how much amniotic fluid there is in four areas of your *uterus*.

What the Results May Mean. If the nonstress test results are nonreactive, it could mean that the fetus is having trouble getting enough oxygen. Results of the amniotic fluid measurement give an idea of how well the *placenta* is working. If the amniotic fluid level is low, it could mean that there is a problem with blood flow in the placenta. A full BPP or contraction stress test may be needed to confirm results.

Contraction Stress Test

The contraction stress test helps your health care professional see how the fetal heart rate reacts when the uterus contracts.

Why It Is Done. The contraction stress test sometimes is used if other test results are positive or unclear.

Frequently Asked Questions

1. Are these tests safe?

Most of these tests are noninvasive (no medical equipment has to enter your body). They pose no risks for the fetus or the woman. Sometimes, an ultrasound exam may be done through the vagina, but this is a safe procedure when done by a trained technician or health care professional.

2. Will the tests hurt?

For most women, these tests are painless. Some women may feel slight discomfort from staying in certain positions for a while or from the contractions that are produced during a CST.

3. In what order will they happen?

There is no set order for the tests. Likewise, no test has been proved to be better than another. Your health care professional will follow the best order for your situation.

4. Why would the same test have to be repeated?

If your results are unclear or show a potential problem, tests are repeated regularly to make sure

the fetus continues to do well for the rest of the pregnancy. Repeat tests can show your health care professional if results were accurate. Additional care may be necessary. Repeat tests help to make sure that unnecessary steps are not taken.

5. Why might my baby be delivered early?

Sometimes the baby has a better chance of being healthy when delivered before your due date. With some high-risk problems, the benefits of early birth outweigh those of continuing the pregnancy.

Some women will have a *cesarean birth* if they have to give birth early. In some cases, labor may be started with drugs or other means. The fetal heart rate and your contractions will be monitored during labor.

How It Is Done. In this test, belts with sensors that detect the fetal heart rate and uterine contractions are placed across your abdomen. To make your uterus contract mildly, you may be asked to rub your nipples through your clothing or you may be given *oxytocin*. Your uterus may contract on its own, especially if the test is done late in pregnancy.

If the fetal heart rate does not decrease after a contraction, the result is normal (negative). A decrease in heart rate after most contractions is a positive result (the results are concerning to the professional). Results also can be equivocal (the results are not clear) or unsatisfactory (there were not enough contractions to produce a meaningful result).

For some women, this test may increase the risk of some complications. The contractions could cause labor to start if you are at risk of *preterm* delivery (although this is rare). However, in some situations, the benefits of having this test may outweigh the risks involved.

What the Results May Mean. If results are positive or unclear, your health care professional will use results of previous tests, your condition, and the contraction stress test result to decide on the next steps. More testing may be needed. In some situations, the baby may need to be delivered right away.

Doppler Ultrasound Exam of Umbilical Artery

Doppler ultrasound is used to check the blood flow in the umbilical artery, a blood vessel located in the *umbilical cord*.

Why It Is Done. Doppler ultrasound is used with other tests when the fetus shows signs of not growing well. Repeated tests may be done along with other special tests to determine the best time for delivery of the fetus.

How It Is Done. You will be reclining or lying down for this test. A transducer is rolled gently over your abdomen to project sound waves. An image of the artery that is being examined is shown on a computer screen.

What the Results May Mean. A normal test result is one that shows normal blood flow in the umbilical artery. If the test shows problems with the blood flow in the placenta, it can mean that there is a decrease in the amount of oxygen being delivered to the fetus.

Finally...

If your health care professional thinks you need special testing during your pregnancy, you may have a lot of questions (see box). Although no test is 100% accurate, testing may help reassure you and your health care professional that all is going well with your pregnancy. If test results indicate a problem, more testing may be done or you may need special care. In some situations, your baby may need to be delivered right away. Even if test results are normal, weekly or twice-weekly testing may be needed for the rest of your pregnancy.

Glossary

Acceleration: An increase in the heart rate of a fetus.

Amniotic Fluid: Fluid in the sac that holds the fetus.

Cesarean Birth: Birth of a fetus from the uterus through an incision made in the woman's abdomen.

Diabetes Mellitus: A condition in which the levels of sugar in the blood are too high.

Doppler Ultrasound Exam: A type of ultrasound in which sound waves can tell how fast an object is moving. Doppler ultrasound can be used to find the heartbeat of a fetus or how fast blood is moving through a vein or artery.

Fetus: The stage of human development beyond 8 completed weeks after fertilization.

Gestational Age: How far along a woman is in her pregnancy, usually reported in weeks and days.

Multiple Pregnancy: A pregnancy where there are two or more fetuses.

Oxygen: An element that we breathe in to sustain life.

Oxytocin: A hormone made in the body that can cause contractions of the uterus and release of milk from the breast.

Placenta: An organ that provides nutrients to and takes waste away from the fetus.

Postterm Pregnancy: A pregnancy that extends beyond 42 weeks.

Preterm: Less than 37 weeks of pregnancy.

Rh Sensitization: The presence of Rh antibodies in the bloodstream of an Rh-negative person. This happens when an Rh-negative person's blood comes into contact with Rh-positive blood.

Stillbirth: Birth of a dead fetus.

Transducer: A device that sends out sound waves and translates the echoes into electrical signals.

Ultrasound Exam: A test in which sound waves are used to examine inner parts of the body. During pregnancy, ultrasound can be used to check the fetus.

Umbilical Cord: A cord-like structure containing blood vessels. It connects the fetus to the placenta.

Uterus: A muscular organ in the female pelvis. During pregnancy, this organ holds and nourishes the fetus.

This information was designed as an educational aid to patients and sets forth current information and opinions related to women's health. It is not intended as a statement of the standard of care, nor does it comprise all proper treatments or methods of care. It is not a substitute for a treating clinician's independent professional judgment. Please check for updates at www.acog.org to ensure accuracy.

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This is EP098 in ACOG's Patient Education Pamphlet Series.

ISSN 1074-8601

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