TEST

Fetal scalp ph testing

Fetal scalp pH testing measures the acidity of a baby's blood during labour.

WHAT IT MEASURES
Acidity in blood from the baby's scalp

SAMPLE
Capillary blood from the baby's scalp

FASTING NEEDED?
No

HOW LONG IT TAKES
Usually 10 to 20 minutes during labour

RESULTS IN
Minutes, varying by hospital equipment and laboratory service

USED FOR
Diagnosis of possible fetal acidosis during labour

MAIN LIMITATION
Sampling can fail, and the baby's condition can change quickly

Overview

Fetal scalp pH testing, also called fetal scalp blood sampling, is a blood test that may be performed during labour.

It measures the acidity, or pH, of a small blood sample from the baby's scalp. A lower pH can mean acids are building up, which may happen if the baby is not receiving enough oxygen.

The test may add information when continuous fetal heart monitoring, called cardiotocography or CTG, raises concern. CTG records the baby's heart rate and contractions but does not directly measure blood acidity.

The test is not used routinely everywhere. NICE advises against fetal blood sampling in UK maternity care. Some health systems elsewhere still use it under local protocols, while others rely on fetal scalp stimulation, scalp lactate testing or CTG assessment.

Why the test is ordered

The test may be considered when the fetal heart rate pattern is concerning but does not

clearly show whether birth must happen immediately. It provides a snapshot of the baby's acid balance and may suggest that the baby:

The test must not delay an urgent birth when the CTG or overall clinical situation already indicates that immediate action is needed.

- Is coping with labour
- Needs closer monitoring or another sample
- May need birth to be expedited

Who should have the test

This is not a routine screening test. Where offered, it is generally considered only when there is concern about the fetal heart rate during active labour.

The waters must have broken, the cervix must be open enough to reach the baby's scalp safely, and the head must be in a suitable position.

The test may be unsuitable if making a small cut could cause excessive bleeding or transmit an infection. This can include a suspected fetal bleeding disorder and certain maternal infections. Gestational age, the baby's position and how soon birth is expected also matter.

The maternity team should explain why the test is being considered, the alternatives and whether the hospital currently uses it.

How to prepare

You do not need to fast. Food, coffee and ordinary activity do not usually affect the result. Follow any separate instructions given because anaesthesia or surgery may be needed.

You may be asked to lie on your back with your legs supported, as for a vaginal examination. Tell the team if this position is painful, makes you light-headed or is difficult to maintain.

Existing pain relief, including an epidural, can usually continue. The clinician should ask for your consent and explain how the result may affect your care.

What happens during the test

A clinician performs a vaginal examination and passes a viewing instrument through the cervix to see part of the baby's scalp. The area is cleaned, and a tiny cut is made in the skin.

Drops of blood are collected into a narrow tube and tested promptly using a blood gas analyser. Obtaining enough blood can be difficult, so more than one attempt may be needed.

The procedure usually takes 10 to 20 minutes. You may feel pressure or discomfort from the examination and instruments. The tiny scalp wound usually needs no treatment.

Understanding your results

A lower blood pH means greater acidity. During labour, increasing acidity can suggest that the baby is having difficulty maintaining a normal oxygen balance.

A commonly used framework is:

These cut-offs are not universal. Interpretation varies by analyser, local protocol, pregnancy circumstances and the overall clinical picture.

The result is considered alongside the CTG, labour progress, infection or bleeding, medicines used during labour and how soon vaginal birth is likely.

Some hospitals measure lactate instead. Lactate is produced when cells have limited oxygen available. Lactate and pH use different values and must not be compared directly.

- Above 7.25: usually reassuring
- 7.21 to 7.24: usually borderline
- 7.20 or below: usually abnormal

What affects the results

Results are sensitive to sample collection and handling. Important influences include:

Prolonged rapid maternal breathing may alter carbon dioxide levels. Fever, infection, low blood pressure and some medicines can also affect the baby's condition.

Food, coffee, ordinary movement and time of day are not important sources of error.

- Too little blood or clotting before analysis
- Contact with air, amniotic fluid or vaginal fluid
- Delayed testing
- Mixing with maternal blood
- Pressure or swelling at the sampling site

- Rapid changes in the baby's condition after collection

Accuracy and limitations

A properly collected low pH result can identify acid build-up at that moment, but it cannot reliably predict whether the baby will have complications after birth.

Temporary changes, contamination or carbon dioxide build-up may lower pH without indicating ongoing injury. Conversely, a reassuring result can be followed by rapid deterioration, especially if the concerning CTG pattern continues. Monitoring therefore continues after a normal result.

Sampling can fail, and the procedure takes time. It is unsuitable when birth needs to happen urgently.

Scalp lactate testing needs less blood and may be easier to perform, but it has not been shown to produce clearly better outcomes. CTG provides continuous information but may raise concern when the baby is coping. Umbilical cord blood testing after birth can assess acid balance but cannot guide decisions before birth.

Risks and complications

The vaginal examination and instruments may cause discomfort or pressure, particularly during a contraction.

The scalp cut may cause minor bleeding or a small mark. Infection and persistent bleeding are uncommon but are more concerning if the baby has a bleeding disorder or an infection could be transmitted through broken skin.

Repeated attempts can cause several small wounds. The team should stop if a sample cannot be obtained promptly or birth should no longer be delayed.

What happens next

If the result is reassuring and the fetal heart pattern improves, labour may continue with close monitoring. Some local protocols recommend another sample if the abnormal pattern continues.

A borderline result prompts review of the full situation. The team may change your position, treat low blood pressure, reduce medicine causing overly frequent contractions or repeat the

assessment.

An abnormal result, worsening CTG or other urgent concern may lead to expedited birth. This may involve assisted vaginal birth or caesarean birth, depending on cervical dilation, the baby's position and the urgency.

After birth, staff may inspect the sampling site. Tell them promptly about continued scalp bleeding. Once home, seek urgent medical advice for persistent bleeding, spreading redness, swelling or discharge, or if your baby becomes unusually difficult to wake or feed.

Common questions

Can I drink coffee before fetal scalp pH testing?

Yes. Coffee does not usually affect the result, but follow separate instructions related to possible anaesthesia or surgery.

Does the time of day matter?

No. Testing is performed when concern arises during labour.

Can I exercise beforehand?

Ordinary activity does not meaningfully alter the test. During labour, follow the team's advice about movement and monitoring.

Does the test hurt the baby?

It involves a very small scalp cut that usually heals without treatment. Minor bleeding or a small mark can occur.

Why might the test need to be repeated?

The result reflects one moment. If the heart rate remains concerning, the baby's acid balance may change.

Can I refuse the test?

Yes. The clinician should explain why it is recommended, its limitations, the alternatives and how the result would change the plan.

Sources

- National Institute for Health and Care Excellence. Fetal monitoring in labour . NICE guideline NG229 , 2022

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- Royal Australian and New Zealand College of Obstetricians and Gynaecologists. Intrapartum Fetal Surveillance Clinical Guideline , fourth edition , 2019
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