TEST

Cytologic evaluation

Cytologic evaluation examines individual cells for changes linked to cancer, infection, or inflammation.

WHAT IT MEASURES
Cell changes suggesting cancer, infection, inflammation, or other conditions

SAMPLE
Cells from a swab, fluid, scraping, brushing, or needle

FASTING NEEDED?
Sometimes, when sedation or another procedure requires it

HOW LONG IT TAKES
Minutes; longer when collected during another procedure

RESULTS IN
Several days, with timing varying by laboratory and extra tests

USED FOR
Screening, diagnosis, and monitoring

MAIN LIMITATION
A small sample can miss abnormal cells

Overview

Cytologic evaluation, often called cytology, is the examination of individual cells under a microscope. A laboratory specialist looks at their size, shape, internal structures, and arrangement.

Cells may be collected from the body's surface, from a fluid, or through a thin needle. Examples include cervical screening samples, urine, sputum coughed up from the lungs, fluid around an organ, and cells taken from a lump.

Cytology may identify cells that appear normal, inflamed, infected, precancerous, or cancerous. It can sometimes suggest a particular type of cancer. However, cytology usually provides less information than a biopsy, which removes a piece of tissue and shows how cells are arranged within it.

"Cytologic evaluation" describes a broad group of tests rather than one standard procedure. Preparation, collection, reporting, and accuracy differ according to the body site and reason for testing.

Why the test is ordered

Cytology may be ordered to:

A cytology result can help decide whether you need imaging, repeat sampling, a biopsy, or routine follow-up. It is rarely interpreted on its own. Your symptoms, examination findings, imaging, and other laboratory results also matter.

- Screen for abnormal cells before symptoms develop, as in cervical screening
- Investigate a lump, unusual bleeding, persistent cough, or abnormal imaging result
- Examine fluid that has collected around the lungs, heart, or abdominal organs
- Look for cancer cells in urine, sputum, or another body fluid
- Help identify infection or inflammation
- Monitor a previously treated condition

Who should have the test

Whether cytology is appropriate depends on the body area being examined and the clinical question.

Some people have cytology as part of an established screening program, particularly cervical screening. Eligibility and timing vary by age, previous results, local guidance, and whether human papillomavirus testing is used.

Diagnostic cytology may be considered when there is a lump, an unexplained fluid collection, an abnormal scan, or symptoms that need further investigation. Urine or sputum cytology is useful only in selected situations and is not a general screening test for everyone.

A clinician requesting the test should explain which sample is needed and what the result may or may not show.

How to prepare

Preparation is based mainly on how the cells will be collected.

Most urine, sputum, swab, and surface-scraping samples do not require fasting. You may need to follow instructions about when to collect the sample, how to clean the area, or which container to use.

For cervical cytology, you may be asked to avoid vaginal medicines, creams, lubricants, or sex

for a short period before collection. Instructions differ between services. Tell the clinic if you are menstruating, pregnant, or could be pregnant.

If cells will be collected by fine-needle aspiration or during an endoscopy, bronchoscopy, or other procedure, you may need to stop eating beforehand. Do not stop blood thinners or other medicines unless the procedure team specifically tells you to do so.

Tell the team about allergies, medicines, pregnancy, bleeding problems, and previous surgery or treatment in the area being sampled.

What happens during the test

The collection method depends on the sample.

A swab, brush, or small scraping tool may collect cells from a surface such as the cervix, mouth, or skin. This usually takes a few minutes. You may feel pressure or brief discomfort.

Urine, sputum, or another naturally produced sample may be collected into a sterile container. Some tests require more than one sample because abnormal cells may not appear every time.

A fine-needle aspiration uses a thin needle to remove cells from a lump or organ. Ultrasound or another imaging method may guide the needle. Local anaesthetic may be used, although this is not always necessary.

Fluid around the lungs, abdomen, or another organ may be collected through a separate medical procedure. The collection procedure has its own preparation and risks.

In the laboratory, cells are placed on slides or concentrated into a small sample. They are stained with dyes so that their structures are easier to see. Extra stains, molecular tests, or review by another specialist may be needed.

Understanding your results

The wording of a cytology report varies by body site and reporting system. There is no universal normal range.

Common descriptions include:

An atypical result does not by itself mean cancer. Infection, inflammation, treatment effects, and normal repair can make cells look unusual.

A negative result means abnormal cells were not found in that sample. It cannot always rule out disease, especially if the sample was small or did not come from the affected area.

Interpretation varies by laboratory, age, sex, pregnancy status, medicines, previous treatment, sample type, and clinical context.

- Negative or benign: No cancerous or precancerous cells were identified
- Inflammatory or reactive: Cells look changed because of irritation, infection, injury, or healing
- Atypical: Some cells are unusual, but the cause is uncertain
- Suspicious: Changes raise concern, but the sample is not definitive
- Positive or malignant: Cancer cells were identified
- Unsatisfactory or inadequate: There were not enough well-preserved cells to interpret reliably

What affects the results

Cytology depends heavily on collecting representative, well-preserved cells. A result can be misleading even when the laboratory performs the examination correctly.

Important influences include:

Tell the requesting clinician about recent procedures and cancer treatment. These details help the laboratory interpret unusual cells correctly.

- Sampling location: The tool or needle may not reach the abnormal area
- Too few cells: A thin or poorly collected sample may be inadequate
- Blood or inflammation: These can hide the cells that need to be examined
- Sample delay or damage: Cells may break down if collection, storage, or transport instructions are not followed
- Recent procedures: Surgery, catheter use, biopsy, radiation, or instrumentation can make cells appear reactive
- Medicines and treatment: Chemotherapy, radiation, immune treatments, and some local medicines can alter cell appearance
- Hormonal changes: Pregnancy, menopause, and menstrual timing can affect some cervical and vaginal samples
- Dilution: Very dilute urine or fluid may contain too few cells
- Sample quality: Saliva instead of deep sputum may not represent the lungs

Accuracy and limitations

Accuracy differs greatly between cervical cytology, urine cytology, sputum cytology, fluid analysis, and needle aspiration. There is no single reliable percentage for cytologic evaluation as a whole.

The test can miss a condition when abnormal cells are not shed, are present only in small numbers, or are not collected. A negative result is therefore less reassuring when symptoms, imaging, or examination findings remain concerning.

Cytology can also suggest disease when none is present. Infection, inflammation, injury, or treatment effects may resemble precancerous or cancerous changes. Specialist review and additional testing can help clarify an uncertain result.

Some cytology tests detect aggressive or advanced cellular changes better than subtle or early ones. For example, urine cytology is generally better at finding high-grade urinary cancers than low-grade tumours.

A biopsy may be the better test when the diagnosis requires information about tissue structure or whether abnormal cells have invaded surrounding tissue. Human papillomavirus testing may be used with or instead of cervical cytology in some screening programs.

Risks and complications

Providing urine, sputum, or another naturally produced sample has little physical risk.

A swab or scraping may cause brief discomfort or light spotting. A fine-needle aspiration can cause soreness, bruising, or minor bleeding.

Procedures used to obtain deeper fluid or tissue have additional risks based on the body site. The procedure team should explain these before collection.

After an invasive collection, seek emergency care for trouble breathing, uncontrolled bleeding, fainting that does not quickly improve, or rapidly increasing swelling. Contact the procedure team promptly about fever, worsening pain, redness, drainage, or bleeding that continues. Mild soreness or a small bruise can usually be discussed during routine follow-up.

What happens next

A benign or negative result may require no further action, routine screening, or follow-up of the symptoms that led to testing.

An inadequate sample often needs to be repeated. This does not mean that abnormal cells were found; it means the laboratory could not assess the sample reliably.

Atypical or suspicious findings may lead to repeat cytology, infection testing, imaging, endoscopy, or biopsy. A positive result usually requires further evaluation to confirm the diagnosis, identify the exact cell type, or determine the extent of disease.

Ask when and how you will receive the result. If the expected date passes, contact the service that arranged the test rather than assuming that no news means a normal result.

Common questions

Can I drink coffee before cytology?

Usually, yes. Coffee does not affect most swab, urine, or sputum cytology tests. Do not drink it if you have been told to fast for sedation or another collection procedure.

Does the time of day matter?

Sometimes. Certain urine or sputum collections have specific timing instructions. Follow the container label or laboratory instructions rather than choosing a time yourself.

Can I exercise beforehand?

Ordinary exercise usually does not change cell appearance. Avoid strenuous activity if the procedure team advised it or if you are having an invasive collection with sedation.

Can cervical cytology be done during my period?

It may be possible, but heavier bleeding can hide cervical cells and make the sample inadequate. Contact the screening service for instructions if you expect to be menstruating.

Does an abnormal result mean cancer?

No. Atypical or reactive cells can result from infection, inflammation, hormonal changes, injury, or treatment. The exact report wording and any recommended follow-up are important.

Why might I need a biopsy after cytology?

Cytology examines loose or extracted cells. A biopsy shows how cells are arranged in tissue and may confirm whether abnormal cells have invaded nearby structures.

Sources

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