TEST

Urinalysis

A urinalysis checks urine for chemicals, cells, and other signs of health problems.

WHAT IT MEASURES
Urine chemicals, cells, crystals, and microorganisms

SAMPLE
Urine

FASTING NEEDED?
No

HOW LONG IT TAKES
Usually five to ten minutes

RESULTS IN
Often same day; timing differs by laboratory

USED FOR
Screening, diagnosis, and monitoring

MAIN LIMITATION
Contamination and medicines can produce misleading results

Overview

A urinalysis is a group of tests performed on a urine sample. It can provide information about the urinary system and may also show changes linked with conditions elsewhere in the body.

A complete urinalysis may include three parts:

"Casts" are tiny tube-shaped particles formed in the kidneys. Their meaning depends on the type and the rest of your results.

Urinalysis is not the same as a urine culture. A culture attempts to grow bacteria or yeast from urine and usually takes longer. It can help identify which microorganism is present and which antibiotics like amoxicillin or doxycycline may work.

- Visual examination: checks the urine's colour and clarity
- Dipstick testing: uses a treated strip to check chemicals in the urine
- Microscopy: examines the sample under a microscope for cells, crystals, casts, and microorganisms

Why the test is ordered

Urinalysis can help investigate urinary symptoms such as pain or burning when passing urine, needing to urinate often, lower abdominal discomfort, or blood-coloured urine.

It may also be ordered to look for signs of:

The test may be included in pregnancy care, before some procedures, or during monitoring for kidney disease and certain long-term conditions. Testing without symptoms is useful only in selected situations, so an unexpected result does not automatically mean treatment is needed.

- A urinary tract infection
- Kidney inflammation or damage
- Kidney stones
- Diabetes or very high blood sugar
- Liver or bile-flow problems
- Dehydration

Who should have the test

You may be offered urinalysis if you have urinary symptoms, visible blood in your urine, unexplained swelling, or findings from another test that need investigation.

It may also be appropriate if you:

Routine testing practices differ. A urinalysis may not be useful for every person who feels well, because harmless or temporary abnormalities are common.

- Are being monitored for kidney or urinary disease
- Are pregnant and having routine prenatal testing
- Take a medicine that may affect kidney function
- Are preparing for certain operations or urinary procedures
- Need follow-up after a previous abnormal urine result

How to prepare

You usually do not need to fast. You can generally eat, drink, and take your usual medicines unless you have been given different instructions for another test being done at the same

time.

Tell the healthcare professional arranging the test about prescription medicines, non-prescription medicines, supplements, and recent antibiotics. Do not stop a medicine unless you have been specifically advised to do so.

A clean-catch, midstream sample is often requested. If possible, wash your hands and clean around the urinary opening using the materials provided. Begin urinating into the toilet, then collect urine in the container without touching its inside. Finish urinating into the toilet.

Tell the laboratory or clinic if you are menstruating or have vaginal bleeding or discharge. These can contaminate the sample. If the test is not urgent, you may be asked to collect it at another time.

What happens during the test

You will receive a labelled, sterile container and instructions about where to collect the sample. A small amount of urine is usually enough, although the required amount differs between laboratories.

The sample should be returned promptly. If it will be collected at home, follow the storage and delivery instructions carefully. Urine changes as it stands, especially at room temperature.

In some situations, urine is collected through a catheter, which is a thin tube passed into the bladder. This is not usually needed for a routine urinalysis. It may be used when you cannot provide a sample or when a less contaminated specimen is essential.

Understanding your results

Results should be interpreted together rather than one item at a time. Reference ranges and interpretation vary by laboratory, age, sex, pregnancy status, medicines, and clinical context.

Common parts of a urinalysis include:

Microscopy may report red and white blood cells, epithelial cells, bacteria, yeast, crystals, or casts. Some findings can come from contamination rather than disease.

A result marked "abnormal" is not a diagnosis. Its importance depends on symptoms, how the sample was collected, and whether the finding continues on repeat testing.

- Specific gravity: estimates how concentrated or diluted the urine is
- pH: shows how acidic or alkaline the urine is

- Protein: may appear temporarily, but persistent protein can need kidney testing
- Glucose: can occur when blood sugar is high or because of certain medicines
- Ketones: may appear during fasting, vomiting, low-carbohydrate eating, or diabetes
- Blood: may reflect red blood cells, free haemoglobin, or muscle protein
- Leukocyte esterase: suggests the presence of white blood cells
- Nitrite: can indicate certain bacteria, but many infections produce no nitrite
- Bilirubin and urobilinogen: may provide information about the liver, bile ducts, or red blood cell breakdown

What affects the results

Urinalysis is particularly sensitive to collection and handling. A misleading result can occur even when the laboratory performs the test correctly.

Drinking a large amount of fluid can dilute urine and make some substances harder to detect. Dehydration can concentrate the sample and make small amounts appear more significant.

Recent vigorous exercise can temporarily cause blood or protein in urine. Fever and acute illness can also produce short-lived protein.

Menstrual blood, vaginal discharge, skin cells, semen, toilet water, or cleaning products may enter the container. Collecting the first urine stream rather than a midstream sample can increase contamination.

Delays before testing can allow bacteria to multiply, cells to break down, and the urine's pH to change. Light exposure can also alter some chemicals.

Medicines can affect results. For example, vitamin C may interfere with some dipstick reactions. Phenazopyridine, used for urinary discomfort, can turn urine orange and interfere with colour-based testing. Antibiotics may reduce detectable bacteria. Sodium-glucose cotransporter-2, or SGLT2, medicines intentionally increase glucose in urine.

Pregnancy, age, kidney function, diet, fasting, and recent catheter use can also change findings. Foods and medicines may alter urine colour without changing the underlying chemistry.

Accuracy and limitations

Urinalysis is useful for finding clues, but it cannot confirm or exclude every condition.

A negative nitrite result does not rule out a urinary tract infection. Some bacteria do not produce nitrite, and urine may not have remained in the bladder long enough for nitrite to form. White blood cells may support infection, but they can also occur with inflammation or contamination.

A dipstick may report blood when there are no intact red blood cells. This can happen when haemoglobin or muscle protein is present. Microscopy helps clarify the result, although bleeding can be intermittent and may be missed in a single sample.

Standard protein dipsticks mainly detect albumin, one type of protein. They can miss smaller amounts and some other proteins. A urine albumin-to-creatinine ratio is usually better for measuring low-level albumin loss.

Urine glucose is not a reliable stand-alone test for diabetes. Blood glucose or HbA1c testing is better for assessing blood sugar. If infection needs confirmation or antibiotic selection, a urine culture is more informative than urinalysis alone.

Risks and complications

Providing urine naturally has no direct medical risk. Some people find collection awkward or may spill the sample.

Catheter collection can cause brief discomfort and, less commonly, bleeding or infection. These risks relate to catheter insertion, not to laboratory testing of the urine.

What happens next

A normal result may require no further action. If a finding is unexpected but you feel well, the usual next step may simply be a correctly collected repeat sample.

Further testing may include a urine culture, urine albumin-to-creatinine ratio, blood tests for kidney function or glucose, or imaging of the urinary system. Persistent blood in urine may need additional assessment even when it is not visible.

Arrange routine follow-up to discuss persistent urinary symptoms, repeated abnormal results, or visible blood in the urine.

Seek urgent medical advice for fever with pain in your side or back, vomiting that prevents fluids staying down, urinary symptoms during pregnancy, or worsening symptoms with significant illness. Seek emergency care if you cannot pass urine and have severe pain, are passing clots that block urine flow, or develop confusion, fainting, or severe weakness.

Common questions

Can I drink coffee before a urinalysis?

Usually, yes. Fasting is not normally required. Coffee can increase urination and may affect hydration, so follow any specific instructions and avoid drinking an unusually large amount before collection.

Does the time of day matter?

Sometimes. First-morning urine is more concentrated and may be requested for certain measurements or pregnancy testing. For routine urinalysis, a sample collected at another time is often acceptable.

Can I exercise beforehand?

Avoid unusually strenuous exercise if possible. Hard exercise can temporarily cause protein or blood to appear in urine.

Can I take my medicines before the test?

Usually, yes. Some medicines alter urine chemistry or colour, so provide a complete medicine and supplement list. Do not stop prescribed treatment without instructions.

Can I give a sample during my period?

You can if the test is urgent, but menstrual blood may affect the result. Tell the clinic or laboratory. For non-urgent testing, collection may be delayed or repeated.

How long should I hold my urine before collecting it?

Routine urinalysis usually does not require you to hold urine for a set time. If infection testing is planned, the collection instructions may be more specific.

Sources

- MedlinePlus Medical Test: Urinalysis , US National Library of Medicine
- Hitzeman N, Greer D, Carpio E. Office-Based Urinalysis: A Comprehensive Review . American Family Physician . 2022;106(1):27-35
- Hematuria (Blood in the Urine) , National Institute of Diabetes and Digestive and Kidney Diseases

- Nicolle LE, Gupta K, Bradley SF, et al. Clinical Practice Guideline for the Management of Asymptomatic Bacteriuria: 2019 Update . Clinical Infectious Diseases . 2019;68(10):e83-e110