TEST

Immunoelectrophoresis - urine

A urine test that identifies antibody proteins, including abnormal light chains made by certain blood cells.

WHAT IT MEASURES
Types of antibody proteins, especially abnormal light chains, in urine

SAMPLE
Urine

FASTING NEEDED?
No

HOW LONG IT TAKES
Minutes for spot urine; 24 hours for timed collection

RESULTS IN
Usually several days; turnaround differs by laboratory

USED FOR
Supporting diagnosis and monitoring of monoclonal protein disorders

MAIN LIMITATION
Dilute urine or incomplete collection can hide abnormal proteins

Overview

Urine immunoelectrophoresis is used to identify specific proteins in urine. It focuses on immunoglobulins, also called antibodies, and parts of antibodies known as light chains.

Antibodies are normally made by plasma cells, a type of white blood cell. Sometimes one group of plasma cells makes many copies of the same antibody or light chain. This is called a monoclonal protein . Light chains found in urine may also be called Bence Jones proteins .

The test separates urine proteins using an electric current and then identifies them with antibodies. Traditional immunoelectrophoresis is now used less often because a related method called immunofixation can detect and identify smaller amounts of protein more clearly.

Laboratories may use "urine immunoelectrophoresis" as a general name for urine protein electrophoresis followed by immunofixation. Your report should state which method was used.

Why the test is ordered

This test may be ordered when a healthcare professional is investigating an unexplained abnormal protein result or a condition involving plasma cells.

Reasons may include:

The result is usually considered alongside blood tests. These may include serum protein electrophoresis, serum immunofixation and serum free light chains. Kidney function, blood counts, calcium levels and symptoms may also affect how the findings are interpreted.

- Checking for monoclonal light chains in urine
- Following up abnormal blood protein tests
- Helping assess suspected multiple myeloma or a related plasma cell disorder
- Investigating possible light-chain amyloidosis, in which abnormal proteins collect in tissues
- Measuring or monitoring a previously identified urinary monoclonal protein

Who should have the test

Urine immunoelectrophoresis is not usually used as a general screening test for people without a relevant medical reason.

You may be offered it if another test has found an unusual protein pattern, or if your symptoms and other results suggest that checking for a monoclonal protein may be useful. It may also be used during follow-up if you already have a condition that produces urinary light chains.

An abnormal result does not by itself diagnose cancer or another specific illness. Small monoclonal proteins can occur in several settings, and further testing is often needed.

How to prepare

Fasting is not normally required. You can usually eat and drink as usual unless you have separate instructions for another test.

Follow the collection instructions closely. The laboratory may request either a single urine sample or all urine passed during a 24-hour period.

Do not deliberately drink unusually large amounts of water before a spot sample. Very dilute urine can lower the concentration of protein and make a small abnormality harder to detect. Do not restrict fluids unless you have been specifically told to do so.

Tell the healthcare team if you are menstruating, have visible blood in your urine or may have a

urinary infection. These can add other proteins or cells to the sample. Do not stop medicines or supplements unless the professional responsible for your care tells you to.

What happens during the test

For a spot sample, you urinate into a sterile container. You may be asked to provide a clean-catch sample by cleaning the genital area and collecting urine after the flow has started. This reduces contamination from skin cells or discharge.

For a 24-hour collection, you will usually:

If you miss a collection, spill urine or collect outside the stated times, contact the laboratory or clinic. You may need to restart because an incomplete collection can make the measured amount inaccurate.

The laboratory separates the proteins and uses antibodies to identify their type. The collection takes minutes for a spot sample or a full day for a timed sample. Laboratory analysis usually takes longer.

- Empty your bladder at the starting time and discard that urine
- Collect every later urination for the next 24 hours
- Include the final urine passed at the stated finishing time
- Store the container as instructed, often somewhere cool

Understanding your results

Results may be reported as a protein pattern, the presence or absence of a monoclonal band, and sometimes the amount of protein passed over 24 hours.

A result showing no monoclonal protein detected means the test did not find a clear abnormal antibody band in that sample. It does not always rule out a small monoclonal protein. Blood testing may detect light chains that are not present in urine at a measurable level.

If a monoclonal protein is found, the report may identify a light-chain type, such as kappa or lambda. This finding needs to be interpreted with your blood results, kidney function, medical history and any previous tests. It does not establish the cause on its own.

A broad increase involving many antibody types is called a polyclonal pattern . This can occur with inflammation, infection, liver disease or other immune activity and differs from a single monoclonal band.

There is no single universal reference range for every method. Ranges and interpretation vary by laboratory, age, sex, pregnancy status, medicines and clinical context.

What affects the results

The result can be misleading even when the laboratory performs the analysis correctly.

Important influences include:

Pregnancy can change total urine protein and kidney filtration. A recent blood transfusion usually has less direct effect on urine testing than on some blood protein tests, but it should still be mentioned when results are being interpreted.

Most everyday medicines do not directly create a monoclonal urine protein. However, medicines that affect kidney function or treat the underlying condition can change how much protein appears.

- Dilute urine: Heavy fluid intake can lower the protein concentration in a spot sample
- Incomplete 24-hour collection: Missing urine can make protein output appear lower than it is
- Incorrect timing: Collecting for more or less than 24 hours changes the calculated daily amount
- Kidney function: The kidneys control how proteins are filtered and removed, affecting how much light chain reaches urine
- Blood or inflammation in the urinary tract: These can add proteins and complicate the overall pattern
- Recent strenuous exercise: Exercise can temporarily increase urine protein, although it does not usually create a true monoclonal light-chain pattern
- Treatment: Effective treatment for a plasma cell disorder may reduce or remove the detectable protein
- Recent immune therapy or stem cell transplant: Temporary small bands may appear during immune recovery and require specialist interpretation

Accuracy and limitations

The accuracy depends on the laboratory method, urine concentration and amount of abnormal protein present. Traditional immunoelectrophoresis is less able to find very small proteins than

modern immunofixation.

The test can miss an abnormality when the urine is dilute, the 24-hour collection is incomplete or only a small amount of light chain is being produced. Reduced kidney filtration can also change how much reaches the urine. There is no single reliable percentage for how often the test misses a monoclonal protein because performance differs by method and patient group.

A faint or restricted band does not always mean a harmful plasma cell disorder. Small or temporary bands may occur with immune stimulation, after transplantation or during treatment. Repeat testing and comparison with blood results help show whether a band is persistent and clinically important.

For initial investigation, serum protein electrophoresis, serum immunofixation and serum free light-chain testing are often more useful together than urine testing alone. Urine testing can still provide important information about urinary protein loss, light-chain excretion and monitoring in selected conditions.

No single normal urine or blood test should be used alone to exclude a plasma cell disorder when there is ongoing clinical concern.

Risks and complications

Providing a urine sample does not involve needles, radiation or instruments entering the body. The main drawbacks are inconvenience, accidental spills and the possibility of needing to repeat an incomplete timed collection.

What happens next

A normal result may be reviewed with your other blood and urine tests. If clinical concern remains, a healthcare professional may request serum free light chains, blood immunofixation or repeat testing.

An unexpected monoclonal band usually needs timely but routine follow-up. Further evaluation may include blood counts, kidney function, calcium, imaging or, in some cases, a bone marrow test. The next step depends on the protein type, amount, symptoms and other findings.

The test result itself is rarely an emergency. Seek urgent medical help if you develop very little or no urine, new severe confusion, marked breathlessness or rapidly worsening weakness. Call emergency services for severe chest pain, collapse or difficulty breathing rather than waiting to discuss the laboratory result.

Common questions

Can I drink coffee before the test?

Usually, yes. Fasting is not required. Avoid drinking an unusually large volume of coffee or other fluids just before a spot sample because this may dilute the urine.

Does the time of day matter?

Usually not for a spot sample unless the laboratory requests a first-morning specimen. For a 24-hour test, the exact starting and finishing times matter.

Can I exercise beforehand?

Light daily activity is unlikely to cause a problem. Strenuous exercise can temporarily raise total urine protein, so ask whether it should be avoided before collection.

Can I collect the sample during my period?

Menstrual blood can contaminate urine and affect the protein findings. Ask whether the collection should be delayed or whether extra clean-catch steps are appropriate.

What if I miss one collection during a 24-hour test?

Tell the laboratory or clinic. Even one missed urination can make the total inaccurate, and you may be asked to restart.

Does a positive result mean I have multiple myeloma?

No. A monoclonal protein can have several causes, and the amount and pattern must be assessed with blood tests, kidney function, symptoms and sometimes additional investigations.

Sources

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