TEST

Catecholamines - urine

A urine test that measures stress hormones made by the adrenal glands and nerves.

WHAT IT MEASURES
Epinephrine, norepinephrine, and dopamine released into urine

SAMPLE
Urine collected over 24 hours

FASTING NEEDED?
No, unless your laboratory gives specific instructions

HOW LONG IT TAKES
24 hours of home collection

RESULTS IN
Several days, with turnaround differing by laboratory

USED FOR
Investigating and monitoring catecholamine-producing tumors

MAIN LIMITATION
Less reliable than metanephrines for detecting some tumors

Overview

A urine catecholamines test measures epinephrine, norepinephrine, and dopamine. Epinephrine is also called adrenaline, while norepinephrine is called noradrenaline.

These chemical messengers help control the body's response to stress, affecting heart rate, blood pressure, blood flow, and energy use. They are produced by the adrenal glands above the kidneys and by nerve cells.

The test usually measures all catecholamines released into urine over 24 hours. It may help investigate tumors that produce these chemicals, including pheochromocytomas and paragangliomas.

Tests for catecholamine breakdown products, called metanephrines, are generally better at finding these tumors. Your care team may order urinary fractionated metanephrines instead of, or alongside, urine catecholamines.

Why the test is ordered

The test may be ordered if symptoms, medical history, or an imaging result suggest unusually high catecholamine production. Possible symptoms include episodes of headache, sweating, a racing heartbeat, shaking, or high blood pressure. These symptoms have many common causes, and this test cannot determine the cause by itself.

Other reasons for testing include:

Depending on the reason for testing, the laboratory may measure catecholamines, metanephrines, or another breakdown product such as vanillylmandelic acid, known as VMA.

- An adrenal or nearby mass found on a scan
- An inherited condition linked to catecholamine-producing tumors
- Monitoring after treatment for such a tumor
- Selected evaluations in children, although catecholamine metabolites are often preferred

Who should have the test

This is not a routine test for everyone with headaches, anxiety, palpitations, or high blood pressure. A clinician may consider it when symptoms occur in a suggestive pattern, blood pressure is difficult to explain, or another finding raises concern about excess catecholamine production.

Testing may also be appropriate for people with a relevant family history or genetic condition and for those being monitored after treatment.

Urine testing may not be suitable if you cannot collect every sample or have significantly reduced kidney function. A blood test for plasma free metanephrines may be more appropriate.

How to prepare

Follow your laboratory's instructions because collection bottles, preservatives, food restrictions, and storage requirements vary.

You may be asked to avoid caffeine, nicotine, alcohol, and strenuous exercise before and during collection. Coffee, tea, energy drinks, chocolate, smoking, and vaping can affect catecholamine release.

Give your care team and laboratory a complete list of prescription medicines, over-the-counter products, supplements, and recreational drugs. Some antidepressants like sertraline or

fluoxetine , stimulants like methylphenidate or lisdexamfetamine , decongestants, levodopa, pain relievers, and medicines affecting the sympathetic nervous system can alter the result or interfere with testing.

Do not stop any medicine on your own. Stopping suddenly may be unsafe, and testing while taking an essential medicine may still be appropriate.

Unless testing is urgent, avoid collecting on an unusually stressful day. Acute illness, significant pain, low blood sugar, and lack of sleep may raise catecholamine levels.

What happens during the test

The laboratory provides a large container, which may contain a chemical preservative. Do not empty or touch the preservative.

A typical 24-hour collection involves:

You may receive a smaller clean container for collecting each sample before pouring it into the main bottle.

The entire collection matters. If urine is missed, spilled, or discarded, contact the laboratory because you may need to restart with a new container.

The laboratory may measure urine creatinine to help assess whether the collection appears complete.

- On the first morning, urinating into the toilet and recording the time
- Collecting every urine sample after that for the next 24 hours
- Collecting one final sample at the recorded time the following morning
- Storing the container as instructed, often refrigerated or kept cool
- Returning it promptly with the start and finish times recorded

Understanding your results

Results may show the total 24-hour amount of epinephrine, norepinephrine, and dopamine. Some laboratories also compare the amounts with urine creatinine.

Reference ranges vary by laboratory, method, age, sex, pregnancy status, medicines, kidney function, and clinical circumstances. Use the range printed on your report.

A result within range makes persistent heavy catecholamine production less likely but does not completely exclude a small or intermittently secreting tumor, especially if collection was

incomplete.

A high result does not confirm a tumor. Stress, exercise, illness, medicines, nicotine, caffeine, and collection problems can raise the measurement. Your care team will consider the pattern and degree of elevation alongside symptoms, blood pressure, other tests, and imaging findings.

What affects the results

An incomplete collection is a major source of error. Missing urine can produce a falsely low result. Collecting for longer than 24 hours, including urine from outside the collection period, or recording the wrong volume can also be misleading.

Other influences include:

Age, pregnancy, sex, and the laboratory method can also affect interpretation.

- Vigorous exercise, pain, anxiety, acute illness, or poor sleep
- Caffeine, nicotine, alcohol, and certain foods
- Stimulants, decongestants, some antidepressants, levodopa, and other medicines
- Recreational stimulants such as cocaine or amphetamines
- Reduced kidney function
- Incorrect storage or misuse of the supplied preservative

Accuracy and limitations

Urine catecholamines can identify substantial overproduction, but they are not usually the most reliable first test for pheochromocytoma or paraganglioma.

These tumors continuously convert catecholamines into metanephrines, even when hormone release occurs in bursts. Urinary fractionated metanephrines or plasma free metanephrines therefore detect more affected people than catecholamines alone.

Urine catecholamines may miss a condition if secretion is intermittent, a tumor is small, kidney handling is altered, or collection is incomplete. Results may also be high without a tumor because of stress, exercise, illness, medicines, stimulants, or collection errors.

If a result is unexpected or mildly raised, repeating the collection under controlled conditions or using a metanephrine test may provide a clearer answer. Imaging alone cannot establish whether a mass produces catecholamines.

Risks and complications

Urine collection does not usually cause physical complications. The main difficulty is collecting every sample and storing the container correctly.

Preservative in some containers can irritate or burn skin. Keep the bottle upright and away from children. Follow the laboratory's instructions if preservative spills or touches your skin.

What happens next

A result within range may require no further testing if the original level of concern was low. If symptoms continue, your care team may investigate other causes or choose a more sensitive test.

A raised or uncertain result is usually reviewed routinely rather than treated as an emergency. Next steps may include another urine collection, plasma free metanephrines, urinary fractionated metanephrines, a medicine review, or imaging after biochemical results are confirmed.

Do not change medicines based on the result without medical guidance.

Seek emergency care for severe chest pain, major breathing difficulty, fainting, new weakness or difficulty speaking, or a sudden severe headache with serious illness. Do not wait for a urine test result if these symptoms occur.

Common questions

Can I drink coffee before or during the collection?

You may be asked to avoid coffee and other caffeine-containing products because caffeine can increase catecholamine release. Follow your laboratory's instructions.

Does the time of day matter?

The exact starting hour matters less than collecting for precisely 24 hours. Record the start time and include the final sample at that time the next day.

Can I exercise beforehand?

Avoid vigorous exercise if instructed, often before and during collection. Gentle activity is usually reasonable unless your care team says otherwise.

What if I miss one urine sample?

Contact the laboratory. Even one missed sample can make the result falsely low, and you may need to restart.

Should I stop my medicines?

No, unless the clinician managing them tells you to. Give the laboratory a complete medicine and supplement list.

Do I need to keep the container in the refrigerator?

Many collections must be refrigerated or kept cool, but requirements vary. Follow the storage instructions supplied with your container.

Sources

- MedlinePlus Medical Test: Catecholamine Tests
- Mayo Clinic Laboratories: Catecholamine Fractionation, Free, 24 Hour, Urine
- ARUP Consult: Pheochromocytoma-Paraganglioma
- Lenders JWM and colleagues. Pheochromocytoma and Paraganglioma: An Endocrine Society Clinical Practice Guideline. Journal of Clinical Endocrinology & Metabolism . 2014;99(6):1915-1942
- National Cancer Institute: Neuroblastoma Treatment-Patient Version