TEST

Catecholamine blood test

A catecholamine blood test measures adrenaline-related hormones in your bloodstream.

WHAT IT MEASURES
Adrenaline, noradrenaline, and sometimes dopamine

SAMPLE
Blood

FASTING NEEDED?
Sometimes, usually overnight before a morning collection

HOW LONG IT TAKES
About 10 minutes, plus a supervised resting period

RESULTS IN
Several days, varying by laboratory

USED FOR
Diagnosis and monitoring

MAIN LIMITATION
Stress, posture, and exercise can cause misleadingly high results

Overview

A catecholamine blood test measures hormones involved in your body's response to stress. They are produced mainly by the adrenal glands, which sit above the kidneys, and by certain nerve cells.

The main catecholamines are:

Levels can rise quickly during exercise, pain, fear, illness, or emotional stress. Some medicines and stimulants like methylphenidate or lisdexamfetamine can also raise them, so careful preparation is important.

The test is sometimes used when investigating rare tumours called pheochromocytomas and paragangliomas. However, blood or urine tests for metanephrines , substances produced when catecholamines break down, are usually more reliable for this purpose.

It may also be used in specialist assessments of how the nervous system controls blood pressure and heart rate.

- Adrenaline, also called epinephrine

- Noradrenaline, also called norepinephrine
- Dopamine

Why the test is ordered

Your healthcare professional may order the test if symptoms or other findings suggest unusually high catecholamine production. Possible symptoms include repeated headaches, sweating, a racing heartbeat, or marked changes in blood pressure. These symptoms have many more common causes, and the test alone cannot identify their cause.

The test may also be ordered:

For suspected pheochromocytoma or paraganglioma, plasma free metanephrines or urine fractionated metanephrines are often preferred first.

- After an unexpected hormone test result
- During follow-up of a treated catecholamine-producing tumour
- As part of an assessment for certain autonomic nervous system disorders
- During a supervised test of catecholamine regulation

Who should have the test

This is not a routine screening test for people without symptoms or risk factors. It is most useful when your history, examination, imaging, family history, or another laboratory result provides a specific reason for testing.

Testing may be considered if you have an inherited condition associated with pheochromocytoma or paraganglioma. It may also be used after treatment to check whether a known tumour is still producing hormones.

Children may have catecholamine-related testing when a particular childhood tumour is suspected, although urine tests are often used instead. The choice depends on the clinical question and specialist service.

How to prepare

Follow the laboratory's instructions because preparation and reference ranges vary.

You may be asked to fast overnight, having no food and drinking only plain water. Some

centres also ask you to avoid caffeine, nicotine, alcohol, and vigorous exercise before collection.

Tell the healthcare professional about all prescription and non-prescription medicines, supplements, nicotine products, and recreational drugs you use. Decongestants, stimulants, some antidepressants like sertraline or fluoxetine , levodopa, and several blood pressure medicines may affect the result.

Do not stop prescribed medicine unless the professional responsible for your care tells you to. Stopping some medicines suddenly can be harmful. If a medicine cannot be paused safely, it can be considered when interpreting the result.

Arrive with enough time to rest. Rushing, cycling, feeling cold, or anxiety about the needle can temporarily raise catecholamine levels.

What happens during the test

You may be asked to lie quietly for 20 to 30 minutes before collection. Some specialist tests compare samples taken while lying down and standing, so follow positioning instructions carefully.

A healthcare professional places a needle into a vein, usually in your arm. Sometimes an intravenous line is inserted before the resting period so the sample can be taken without a new needle causing a stress response.

The blood goes into a special tube. Because catecholamines can break down after collection, the sample may need to be kept cold and processed or transported promptly.

Understanding your results

Your report may list adrenaline, noradrenaline, and dopamine separately and show whether each is within the laboratory's reference range.

There is no single reference range for everyone. Interpretation varies with the laboratory method, age, pregnancy status, medicines, body position, and clinical circumstances.

A high result does not automatically mean you have a tumour. Stress, pain, exercise, nicotine, caffeine, acute illness, and some medicines can raise levels. Your healthcare professional will consider the degree and pattern of elevation, collection conditions, symptoms, and other results.

A result within range does not always exclude intermittent catecholamine release. These

hormones are released in bursts and disappear from the blood quickly, so metanephrine testing may be more informative when a catecholamine-producing tumour is suspected.

What affects the results

Important influences include:

Sample handling also matters. Delayed processing or incorrect temperature control can alter measured levels, so laboratories use specific collection and transport procedures.

- Posture: Levels, especially noradrenaline, can rise after standing
- Stress or pain: Anxiety, needle discomfort, injury, or acute pain can increase levels
- Exercise: Recent vigorous activity can cause a temporary rise
- Caffeine and nicotine: Coffee, energy drinks, smoking, vaping, and nicotine products may interfere
- Medicines: Stimulants, decongestants, antidepressants, levodopa, and some blood pressure medicines can alter results
- Acute illness: Infection, low blood sugar, breathing difficulty, or severe illness can activate the stress response
- Sleep and temperature: Poor sleep, sleep-related breathing problems, or being very cold may affect release
- Kidney function: Reduced function can change hormone clearance
- Pregnancy and age: Suitable comparison ranges may differ

Accuracy and limitations

A carefully collected high result can provide evidence of increased catecholamine release. However, ordinary stress responses produce the same hormones, so samples taken while anxious, in pain, seated, or soon after exercise may be misleadingly high.

The test can also miss a catecholamine-producing tumour because some tumours release hormones only occasionally and catecholamines remain in the blood briefly.

Plasma free metanephrines or urine fractionated metanephrines are generally better for detecting pheochromocytomas and paragangliomas. Catecholamine testing may still support specialist assessments or monitor a previously identified pattern.

A blood result cannot locate a tumour. Imaging is considered only when biochemical results

and the clinical situation justify it. Borderline results are often repeated under controlled conditions first.

Risks and complications

A blood draw may cause brief discomfort, a small bruise, or light-headedness. Serious complications are uncommon.

Tell the person taking the sample if you have previously fainted during blood tests or take medicine that affects bleeding.

What happens next

A result within the expected range may need no further action. Another type of test may be used if concern remains.

An unexpectedly high result is usually reviewed for possible effects from posture, stress, medicines, caffeine, nicotine, illness, and sample handling. Your healthcare professional may repeat the test under controlled conditions or request plasma or urine metanephrines.

Seek urgent medical advice for repeated severe symptoms such as intense headache, marked palpitations, or very high blood pressure readings, particularly if they are new or worsening.

Call emergency services for chest pain, severe breathing difficulty, fainting, sudden weakness or difficulty speaking, confusion, or a sudden severe headache. Do not wait for a laboratory result.

Common questions

Can I drink coffee before the test?

You may be asked to avoid coffee, tea, cola, and energy drinks because caffeine can raise catecholamine levels. Follow the laboratory's instructions; plain water is usually allowed during a fast.

Does the time of day matter?

It can. Activity, posture, meals, stress, and sleep affect catecholamine release. Many collections occur in the morning after fasting and resting, but instructions vary.

Can I exercise beforehand?

Avoid vigorous exercise for the period specified by the test centre. Even rushing or climbing several flights of stairs immediately beforehand may raise the result temporarily.

Should I stop my medicines?

Do not stop medicines on your own. Give the test centre a complete list so it can advise whether any medicine should be changed safely or considered during interpretation.

Is a blood test better than a urine test?

Neither is best for every purpose. For suspected pheochromocytoma or paraganglioma, blood or urine metanephrine tests are usually more reliable than direct blood catecholamine measurement. Blood sampling requires careful rest and positioning, while urine testing requires timed collection.

Why might the test need to be repeated?

A repeat may be needed if the result is only slightly high, preparation was incomplete, you were unwell or stressed, or collection conditions were not followed.

Sources

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