TEST

VLDL test

A VLDL test estimates the cholesterol carried by particles that mainly transport triglycerides in your blood.

WHAT IT MEASURES
Cholesterol carried in very-low-density lipoprotein particles

SAMPLE
Blood from a vein

FASTING NEEDED?
Sometimes, when ordered with a fasting lipid panel

HOW LONG IT TAKES
Usually under five minutes for the blood draw

RESULTS IN
Usually one to three days; turnaround varies by laboratory

USED FOR
Cardiovascular risk assessment and lipid treatment monitoring

MAIN LIMITATION
Usually estimated from triglycerides rather than directly measured

Overview

Very-low-density lipoprotein, or VLDL, is a particle made mainly by your liver. It carries triglycerides, which are a type of fat, through your bloodstream. It also carries a smaller amount of cholesterol.

A VLDL test usually reports VLDL cholesterol , sometimes written as VLDL-C. This is the amount of cholesterol carried inside VLDL particles. It does not measure the number or size of the particles.

In most routine lipid panels, VLDL cholesterol is not measured directly. The laboratory estimates it from your triglyceride result. Some laboratories use a simple calculation, while others use newer equations. Direct or specialised testing is available but is not commonly needed.

VLDL is one of several blood lipids considered when assessing cardiovascular risk. Other results, including LDL cholesterol, HDL cholesterol, triglycerides and non-HDL cholesterol, usually provide more useful information when considered together.

Why the test is ordered

A VLDL result is most often included in a lipid panel. The test may be ordered to help assess your chance of developing cardiovascular disease, such as a heart attack or stroke.

It may also be used to:

A VLDL result does not show whether an artery is blocked. It also cannot diagnose cardiovascular disease by itself.

- Investigate or monitor raised triglycerides
- Check how diet, activity or weight changes affect your lipid levels
- Monitor treatment intended to lower cholesterol or triglycerides
- Add context to other lipid results, especially non-HDL cholesterol

Who should have the test

You may have VLDL reported when you receive routine cholesterol testing. How often lipid testing is appropriate depends on your age, previous results and overall cardiovascular risk.

Testing may be particularly relevant if you have diabetes, kidney disease, high blood pressure, a previous cardiovascular condition or a family history of early heart disease. It may also be used if you take a medicine that can affect blood lipids.

Children and younger adults may be tested when there is a strong family history, a condition that affects lipid levels or another clinical reason. Testing schedules are not the same for everyone.

How to prepare

Ask whether your lipid panel needs to be fasting or nonfasting. Nonfasting testing is suitable for many routine cholesterol checks. Fasting may be requested when triglycerides were previously high, when a more precise triglyceride result is needed or when another test on the same blood sample requires it.

If fasting is required, follow the instructions from the laboratory or requesting clinician. This commonly means having only water for a stated number of hours. Do not assume that black coffee is permitted.

Continue your medicines unless you have specifically been told otherwise. Bring or provide a

current list of prescription medicines, non-prescription products and supplements.

Avoid making an unusual change to your diet or exercise routine immediately before testing. Your usual pattern is often more useful unless you have been given different instructions.

What happens during the test

A healthcare professional places a small needle into a vein, usually in your arm. The blood is collected into a tube and sent to a laboratory. The blood draw itself usually takes less than five minutes.

There is generally no separate procedure for VLDL. The laboratory measures triglycerides and other lipids, then may calculate VLDL cholesterol from those results.

Afterward, pressure is applied to the needle site. You can usually return to normal activities straight away.

Understanding your results

Your report may list VLDL cholesterol in milligrams per decilitre or millimoles per litre. Some reports do not include it because triglycerides and non-HDL cholesterol can provide similar or more useful information.

A higher VLDL cholesterol result usually reflects a higher triglyceride level. VLDL and the particles left after it releases triglycerides can carry cholesterol into artery walls. However, one result does not show your personal cardiovascular risk on its own.

A low VLDL cholesterol result is usually not concerning by itself. Its meaning depends on your other lipid results, nutrition, health conditions and medicines.

Reference ranges and interpretation vary by laboratory, age, sex, pregnancy status, medicines and clinical context. Cardiovascular risk also depends on factors such as blood pressure, smoking, diabetes, kidney health and family history. For these reasons, the laboratory's marked range is only one part of interpretation.

What affects the results

VLDL cholesterol is commonly estimated from triglycerides, so anything that changes triglycerides can change the reported VLDL result. This can happen even when the laboratory has performed the test correctly.

Recent food intake can temporarily raise triglycerides, especially after a large or high-fat meal. Alcohol can also raise them, sometimes for longer than the meal itself. This is one reason fasting may be requested after an unexpected result.

Other influences include:

Medicines can raise or lower triglycerides and therefore alter estimated VLDL. Examples include lipid-lowering medicines, corticosteroids like prednisone or hydrocortisone , oral oestrogens, retinoids, some antipsychotics like olanzapine or risperidone , some HIV medicines, thiazide diuretics and some beta blockers like metoprolol or propranolol . Do not stop a medicine because of a lipid result. The medicine list helps place the number in context.

Estimated VLDL can also be misleading when the balance between triglycerides and cholesterol inside the particles differs from what the calculation assumes. This is more likely when triglycerides are very high or when certain metabolic conditions are present.

- Recent strenuous exercise or a major change in activity
- Pregnancy, which naturally changes lipid levels
- Poorly controlled blood sugar
- Recent illness, infection, surgery or physical stress
- Changes in weight, diet or alcohol use
- Kidney, liver or thyroid conditions
- Age and hormonal changes

Accuracy and limitations

A routine VLDL result is usually a calculation, not an independent measurement. A commonly used older method estimates VLDL cholesterol as one-fifth of the triglyceride value when results are reported in milligrams per decilitre. This assumes a fixed relationship between triglycerides and VLDL cholesterol, but that relationship is not constant.

As a result, calculated VLDL can be too high or too low. It may suggest an abnormal result when the true VLDL cholesterol is not raised, or it may miss an abnormal level. The problem becomes more important as triglycerides rise. Laboratories may withhold calculated results above the range where their chosen equation is considered reliable.

Newer equations can improve estimates in some situations, but no calculation perfectly measures VLDL particles. Results produced by different laboratories or equations may not match exactly.

Direct VLDL measurement is more complex and is not automatically the better test for routine care. If the goal is to estimate the total cholesterol carried by potentially artery-forming particles, non-HDL cholesterol may be more useful. Apolipoprotein B, or apoB, may be chosen when the number of these particles is important, particularly when triglycerides are raised or lipid results do not agree with each other.

Risks and complications

The risks are those of a routine blood draw. You may have brief discomfort, a small bruise or minor bleeding at the needle site.

Some people feel light-headed or faint. Serious complications are uncommon.

What happens next

A result within the laboratory's expected range may simply be reviewed with the rest of your lipid panel. Routine follow-up depends on your overall cardiovascular risk and why the test was ordered.

An unexpected or raised result may lead to a repeat lipid panel, sometimes after fasting. Other tests may be considered for blood sugar, thyroid, liver or kidney function if there is a reason to look for a condition affecting triglycerides.

Follow-up may include discussion of food choices, alcohol, activity, weight, smoking and medicines. Decisions are usually based on your full risk profile rather than VLDL alone.

An abnormal VLDL result is not usually an emergency. Seek emergency care for symptoms such as new chest pressure, severe shortness of breath, fainting, or sudden weakness or difficulty speaking. Severe, persistent upper abdominal pain with vomiting also needs urgent assessment, particularly if you have been told your triglycerides are extremely high.

Common questions

Can I drink coffee before a VLDL test?

If you were told to fast, have only water unless your instructions specifically allow coffee. Coffee with milk, cream or sugar breaks a fast. If the test is nonfasting, coffee is usually allowed, but it is best to follow the laboratory's instructions.

Do I need to fast?

Not always. Many routine lipid panels can be done without fasting. Fasting may be requested after a high triglyceride result, when a more precise triglyceride measurement is needed or when other ordered tests require it.

Does the time of day matter?

VLDL is not usually collected at one required time of day. The timing of meals, alcohol and fasting often matters more. Repeat tests are easier to compare when they are performed under similar conditions.

Can I exercise beforehand?

Normal daily activity is generally fine. Strenuous or unusually long exercise can temporarily change triglycerides, so avoid an unplanned hard workout shortly before the test unless you have been told otherwise.

Should I take my medicines before the test?

Usually, yes. Take medicines as prescribed unless you have received different instructions. Make sure the person interpreting the result knows what medicines and supplements you use.

Why is there no VLDL result on my lipid panel?

Some laboratories do not report VLDL because it is an estimate and may not add useful information beyond triglycerides and non-HDL cholesterol. It may also be omitted when triglycerides are too high for the laboratory's calculation.

Sources

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