TEST

Ethylene glycol blood test

A blood test that measures ethylene glycol after a possible poisoning

WHAT IT MEASURES
Ethylene glycol, a toxic alcohol found in some antifreeze

SAMPLE
Blood

FASTING NEEDED?
No

HOW LONG IT TAKES
Usually less than five minutes

RESULTS IN
Several hours to two days, varying by laboratory

USED FOR
Diagnosis of suspected ethylene glycol poisoning

MAIN LIMITATION
A late sample may be negative after toxic metabolism

Overview

An ethylene glycol blood test measures ethylene glycol in your blood. Ethylene glycol is a toxic alcohol used in some antifreeze, de-icing fluids, industrial products, and solvents.

The body converts ethylene glycol into metabolites that can make the blood too acidic and damage the kidneys and other organs. As this happens, the amount of unchanged ethylene glycol in the blood falls.

This is usually an emergency test, not a routine screening test. It is most useful soon after a known or suspected exposure. Because results may take time, urgent treatment may begin before the level is available.

If someone may have swallowed antifreeze or another product containing ethylene glycol, contact emergency services or a poison centre immediately. Do not wait for symptoms or try to cause vomiting.

Why the test is ordered

The test helps confirm or rule out ethylene glycol exposure and shows how much unchanged ethylene glycol remains in the blood.

It may be ordered after a reported ingestion or when findings suggest toxic alcohol poisoning, such as unexplained drowsiness, vomiting, rapid or deep breathing, confusion, kidney problems, or excessive acidity in the blood.

Other tests are usually performed at the same time, including electrolytes, kidney function, blood acidity, calcium, glucose, measured osmolality, and tests for other alcohols. These can show the effects of toxic metabolites and help guide care when the direct result is delayed.

Who should have the test

You may need this test if there is reasonable concern that you swallowed or were exposed to ethylene glycol. Examples include:

An osmol gap is the difference between the measured and calculated concentration of dissolved particles in the blood. It can support concern about a toxic alcohol but cannot identify ethylene glycol by itself.

Testing is not usually needed for ordinary contact with intact skin. Remove contaminated clothing and wash the skin. Discuss industrial inhalation or skin exposure with a poison centre or occupational health service because the product and circumstances matter.

- A witnessed or reported ingestion of antifreeze or industrial fluid
- Drinking an unknown liquid that may contain a toxic alcohol
- Unexplained severe blood acidity or an abnormal osmol gap
- Symptoms and laboratory findings consistent with toxic alcohol poisoning
- Monitoring during treatment when repeat results are available promptly

How to prepare

No fasting is needed. In an emergency, do not delay the blood draw because of food, coffee, exercise, or medicines.

Tell the healthcare team what product may have been involved, how much might have been swallowed, and when it happened. Bring the container or a photograph of its label if this can be done safely.

Mention alcohol use and any treatment already given. Ethanol and the antidote fomepizole

slow the conversion of ethylene glycol into harmful metabolites. Dialysis can remove ethylene glycol from the blood.

Do not drink alcohol to treat yourself. Do not induce vomiting unless a poison specialist specifically tells you to do so.

What happens during the test

A healthcare professional takes blood from a vein, usually in your arm. The skin is cleaned, and a needle is inserted. Collection usually takes less than five minutes.

Several tubes may be needed for other urgent tests. The sample may be tested on site or sent to a specialist laboratory.

Understanding your results

Results are usually reported in milligrams per decilitre or millimoles per litre. Units and detection limits vary between laboratories.

Ethylene glycol is not normally expected in blood. However, "not detected" only means the amount was below the method's detection limit. It does not always prove that no exposure occurred.

A detected result supports recent exposure. The level must be interpreted alongside the time since exposure, symptoms, blood acidity, kidney function, other findings, and treatment already given.

A low or undetectable result can be misleading if the sample was collected after much of the ethylene glycol had been converted into harmful metabolites. Conversely, an early sample may show a higher level before major abnormalities appear on other tests. No result should be interpreted without clinical context.

What affects the results

Timing is the most important factor. Ethylene glycol levels are usually highest soon after exposure and fall as the body breaks it down.

Other factors include:

Food, coffee, ordinary exercise, age, sex, and pregnancy do not create ethylene glycol in the blood, although some may affect related tests.

- Fomepizole or ethanol: slows metabolism, keeping unchanged ethylene glycol measurable longer
- Dialysis: removes ethylene glycol and can lower the level quickly
- Kidney function: affects metabolites and related laboratory findings
- Other glycols or alcohols: may complicate interpretation or interfere with some methods
- Assay method: some enzymatic tests may be affected by glycerol or propylene glycol
- Sample timing and handling: collection after treatment or processing delays may affect the result

Accuracy and limitations

Gas chromatography is commonly used because it separates ethylene glycol from many other substances. Not every hospital can perform it, so results may arrive too late to guide initial treatment.

The test may miss exposure if blood is collected after the parent ethylene glycol has been metabolised. A negative result therefore cannot always rule out poisoning.

Some rapid or enzymatic assays may produce an apparent positive result because of another compound. Unexpected positives may need confirmation with gas chromatography or another more specific method.

The osmol gap and anion gap do not replace a direct test. The osmol gap may be normal later in poisoning, while the anion gap may be normal early. When a direct result is delayed or no longer informative, blood acidity, electrolytes, kidney function, measured osmolality, exposure history, and symptoms may provide better immediate guidance. Other toxic alcohols require separate testing.

Risks and complications

A blood draw may cause brief pain, bruising, minor bleeding, light-headedness, or fainting. Serious complications are uncommon.

What happens next

This test is often part of an emergency assessment. If exposure is strongly suspected,

antidote treatment and supportive care may begin before the result returns. Dialysis may be considered in severe cases based on the overall clinical picture, not just one result.

Repeat tests may track ethylene glycol, blood acidity, electrolytes, calcium, and kidney function. Monitoring may continue after ethylene glycol becomes undetectable because its metabolites can still cause harm.

Seek emergency help now for a known or possible ingestion, increasing sleepiness, confusion, seizures, difficulty waking, rapid or deep breathing, severe vomiting, or a marked reduction in urine. Do not manage these symptoms through routine follow-up.

After emergency assessment or treatment, follow-up may include checking kidney function and reviewing how the exposure occurred.

Common questions

Can I drink coffee before the test?

Yes. Fasting is not required, and coffee does not create ethylene glycol in your blood. Do not delay emergency testing to eat or drink.

Does the time of day matter?

The clock time does not matter, but the time since possible exposure matters greatly. Tell the healthcare team the earliest and latest possible exposure times.

Can I exercise beforehand?

Ordinary exercise does not affect the direct measurement. Strenuous exercise can alter related tests, but emergency testing should not be delayed.

How long will the result take?

An on-site laboratory may report it within several hours. A specialist laboratory may take one or two days, depending on transport and schedules.

Can I test for ethylene glycol at home?

No reliable home blood test is available. Product colour, smell, taste, urine appearance, or home testing strips cannot safely confirm or exclude poisoning.

What if the result says "not detected"?

There may be no measurable ethylene glycol, or the sample may have been taken after it was converted into metabolites. Timing, symptoms, and other tests must also be considered.

Sources

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