TEST

Smear of duodenal fluid aspirate

This test examines fluid from the first part of the small intestine for parasites or other microorganisms.

WHAT IT MEASURES
Parasites or other microorganisms in fluid from the duodenum

SAMPLE
Fluid aspirated from the duodenum

FASTING NEEDED?
Yes, usually several hours before endoscopy

HOW LONG IT TAKES
Usually 15-30 minutes, plus preparation and recovery

RESULTS IN
Same day to several days, based on laboratory processing

USED FOR
Diagnosis of a suspected intestinal infection

MAIN LIMITATION
A small sample can miss organisms present elsewhere

Overview

A smear of duodenal fluid aspirate is a laboratory examination of fluid taken from the duodenum. The duodenum is the first part of the small intestine, just beyond the stomach.

The sample is usually collected during an upper gastrointestinal endoscopy. A clinician passes a thin, flexible camera through your mouth and stomach, then removes a small amount of fluid through the instrument. Less commonly, fluid may be collected through a tube without a full endoscopy.

In the laboratory, a drop of fluid is spread onto a glass slide or examined as a wet preparation under a microscope. The laboratory looks for parasites, their larvae, or other microorganisms. Examples include Giardia duodenalis , which may also be called Giardia lamblia , and Strongyloides stercoralis .

A smear is different from a culture or molecular test. Culture tries to grow microorganisms, while molecular testing looks for their genetic material. These tests may be ordered separately on the same or another sample.

Why the test is ordered

This test may help investigate ongoing diarrhoea, abdominal discomfort, weight loss, or poor absorption of nutrients when the cause remains unclear. It is not usually the first test used for these concerns.

Stool testing is generally easier and less invasive. A duodenal fluid smear may be considered when stool tests are negative or inconclusive but an intestinal parasite is still suspected. It may also be requested when you are already having an upper endoscopy for another reason.

The result can help:

- Find certain parasites living in the upper small intestine
- Investigate suspected infection after unclear stool results
- Guide the choice of further stool, blood, culture, or molecular tests
- Support interpretation of findings from an endoscopy or small-bowel biopsy

Who should have the test

A smear of duodenal fluid aspirate is not used for routine screening in people without symptoms or a specific risk.

It may be considered if you have persistent digestive symptoms and there is a reason to suspect a parasite or another infection. Relevant circumstances can include travel, exposure to untreated water, immune suppression, or previous test results that do not explain your symptoms.

For suspected Strongyloides infection, testing can be especially important before medicines that strongly suppress the immune system. However, a duodenal smear is only one possible test. Stool examinations, molecular tests, or blood antibody testing may be more appropriate in some situations.

Your healthcare team will weigh the possible benefit against the inconvenience and risks of collecting the sample.

How to prepare

Because the sample is usually collected during an upper endoscopy, you will need an empty stomach. Follow the fasting instructions from the endoscopy unit. They will tell you when to

stop solid food and which clear liquids, if any, you may drink.

Tell the team if you:

Do not stop a prescribed medicine unless the team arranging the procedure tells you to do so.

Sedation is often used. If you receive it, you will usually need someone to take you home. Follow the facility's instructions about driving, work, alcohol, and important decisions after sedation.

- Are pregnant or could be pregnant
- Take blood thinners like warfarin or apixaban , diabetes medicines, or immune-suppressing medicines
- Have allergies or previous problems with sedation
- Have recently taken antibiotics or antiparasitic medicines
- Have heart, lung, kidney, or bleeding problems

What happens during the test

Before an upper endoscopy, a numbing spray may be applied to your throat. You may also receive medicine through a vein to help you relax. You will usually lie on your side while a mouth guard protects your teeth and the endoscope.

The endoscope passes through your mouth, oesophagus, and stomach into the duodenum. It does not enter your windpipe, although you may feel pressure or briefly gag as it passes your throat.

Fluid is drawn into a sterile container, often through a small catheter passed through the endoscope. The sample is sent to the laboratory promptly because some organisms become harder to identify as the sample cools or ages.

The laboratory may examine the fluid directly and may use stains to make organisms easier to see. If biopsies, cultures, or other tests are needed, these are separate procedures even when collected during the same endoscopy.

Understanding your results

Results are usually reported as organisms seen or not seen. If an organism is found, the report may name it and describe its form, such as a Giardia trophozoite or a Strongyloides larva.

A positive result means the laboratory identified an organism in the sample. Your healthcare

professional will interpret whether it explains your symptoms and whether another test is needed.

A negative result means no target organism was seen in that particular sample. It does not always rule out infection. Parasites may be present in low numbers, appear intermittently, or live in an area that was not sampled.

There is no universal numerical reference range for this test. Reporting and interpretation can vary by laboratory and clinical context. Age, sex, pregnancy status, medicines, and other health conditions may affect how the result is used, although they do not usually change whether an organism is visible.

What affects the results

Several factors can produce a negative or unclear result even when the laboratory has handled the test correctly.

Organisms may be unevenly distributed in the small intestine. A small volume of fluid from one location may not contain them. The number released into intestinal fluid can also change from day to day.

Recent antiparasitic medicines or antibiotics like amoxicillin or doxycycline may reduce the number of organisms. Tell the healthcare team what you have taken and when, including non-prescription products.

Delays in delivering or examining the sample can matter. Some parasite forms lose their typical movement or appearance over time, making recognition more difficult. Sample temperature and the laboratory's preparation method may also affect what can be seen.

Food or excess liquid in the stomach and duodenum can dilute the sample or make collection difficult. This is one reason following fasting instructions is important.

Blood, mucus, intestinal debris, or contamination from other parts of the digestive tract can make the slide harder to read. The experience of the person examining the smear also matters because some organisms can resemble harmless material.

Accuracy and limitations

A direct smear can confirm infection when a clearly identifiable parasite is seen. However, a single smear can miss an infection when few organisms are present or the sampled area does not contain them. There is no single reliable detection rate for every parasite, collection

method, and laboratory.

A result can occasionally appear positive when debris, cells, or a harmless organism is mistaken for a disease-causing parasite. Confirmation by another experienced examiner, a different stain, or another test may be appropriate when the appearance is uncertain.

For Giardia , testing several stool samples collected on different days often gives a better chance of detection. Stool antigen tests and molecular tests can also be more useful than an invasive duodenal aspiration in many cases.

For Strongyloides , one stool examination can miss larvae because they may be passed in small or changing numbers. Repeated stool tests, specialised concentration or culture methods, molecular tests, or blood antibody testing may be used. Blood antibodies can support the diagnosis but may not reliably distinguish a current infection from a past one.

A smear also cannot show which medicine will work against bacteria. If bacterial overgrowth or another bacterial infection is being investigated, culture or molecular testing may be required.

Risks and complications

Most risks come from the upper endoscopy and sedation rather than from removing the small fluid sample. Temporary sore throat, bloating, nausea, or drowsiness can occur.

Less common complications include a reaction to sedation, breathing problems, bleeding, aspiration of stomach contents into the lungs, or a tear in the digestive tract. Your personal risk may be different if biopsies or other procedures are performed at the same time.

After the procedure, seek urgent medical advice for worsening chest or abdominal pain, fever, repeated vomiting, difficulty swallowing, or black stools. Call emergency services for severe breathing difficulty, fainting, vomiting blood, or rapidly worsening symptoms.

Mild throat irritation or bloating usually improves with routine recovery care. Contact the endoscopy unit if these effects persist or concern you.

What happens next

If an organism is found, your healthcare professional will consider the finding alongside your symptoms, exposures, medicines, and other test results. Further testing may be needed to confirm the result or check for related health effects.

If the smear is negative but suspicion remains, routine follow-up may include repeated stool samples, stool antigen testing, molecular testing, blood tests, or review of any biopsies taken

during endoscopy.

A negative result may also lead to investigation of non-infectious causes of ongoing symptoms, such as problems absorbing nutrients or inflammation of the small intestine. The smear alone cannot identify these conditions.

Common questions

Can I drink coffee before the test?

Usually not during the fasting period. Coffee with milk is not a clear liquid, and some centres also restrict black coffee. Follow the endoscopy unit's specific instructions.

Does the time of day matter?

The laboratory result is not normally interpreted by time of day. Appointment timing matters mainly because it determines when you must stop eating and drinking.

Can I exercise beforehand?

Light activity does not usually affect the smear. Avoid activity that interferes with fasting instructions, and follow any limits given because of your health or planned sedation.

Will I be awake during the procedure?

You may be awake with throat numbing medicine, or drowsy with sedation. The approach differs between facilities and according to your needs.

Can a stool test be used instead?

Often, yes. Stool microscopy, antigen testing, or molecular testing is commonly used first. Duodenal aspiration may be considered when those tests are inconclusive or an endoscopy is already planned.

Can I drive home afterward?

Not if you received sedation. Arrange transport and follow the endoscopy unit's instructions about when it is safe to drive again.

Sources

- Centers for Disease Control and Prevention. Clinical Testing and Diagnosis for Giardia Infection . Giardia, 2024.

- Centers for Disease Control and Prevention. DPDx: Giardiasis-Laboratory Diagnosis . Division of Parasitic Diseases and Malaria.
- Centers for Disease Control and Prevention. DPDx: Strongyloidiasis-Laboratory Diagnosis . Division of Parasitic Diseases and Malaria.
- National Institute of Diabetes and Digestive and Kidney Diseases. Upper GI Endoscopy . National Institutes of Health.
- Shane AL, Mody RK, Crump JA, et al. 2017 Infectious Diseases Society of America Clinical Practice Guidelines for the Diagnosis and Management of Infectious Diarrhea . Clinical Infectious Diseases . 2017;65(12):e45-e80.
- Garcia LS, Arrowood M, Kokoskin E, et al. Practical Guidance for Clinical Microbiology Laboratories: Laboratory Diagnosis of Parasites from the Gastrointestinal Tract . Clinical Microbiology Reviews . 2018;31(1):e00025-17.