TEST

Peritoneal fluid culture

A peritoneal fluid culture checks fluid from the abdomen for bacteria or fungi causing infection.

WHAT IT MEASURES
Growth of bacteria or fungi in peritoneal fluid

SAMPLE
Peritoneal fluid, including ascitic or dialysis fluid

FASTING NEEDED?
No, unless sedation or another procedure requires it

HOW LONG IT TAKES
About 15-30 minutes for a typical paracentesis

RESULTS IN
Usually 1-5 days; timing varies by laboratory and organism

USED FOR
Diagnosing infection inside the abdomen

MAIN LIMITATION
Antibiotics or poor sample handling can hide organism growth

Overview

A peritoneal fluid culture looks for bacteria or fungi in fluid from the abdominal cavity. The peritoneum is the thin lining around the abdominal organs. Fluid that collects there is often called ascitic fluid .

The sample is commonly collected with paracentesis . During this procedure, a thin needle or small tube is passed through the abdominal wall. If you receive peritoneal dialysis, fluid may instead be collected through your dialysis catheter.

In the laboratory, the sample is placed in containers that support microorganism growth. If something grows, the laboratory tries to identify it. It may also test which antimicrobial medicines are likely to work.

Culture is usually performed with other tests, particularly a white blood cell count. Culture results take time and should not be used alone to decide whether infection is present.

Why the test is ordered

The test is ordered when infection inside the abdominal cavity is possible. This infection is called peritonitis .

Reasons for testing may include:

In people with cirrhosis and ascites, infection can sometimes occur without a clear hole or injury in an abdominal organ. This is called spontaneous bacterial peritonitis .

A culture may also help distinguish this from secondary peritonitis , which results from a problem such as a perforated bowel, inflamed organ, or abdominal abscess. Secondary peritonitis may produce several different organisms in the same culture.

- New or worsening abdominal pain or tenderness
- Fever, confusion, vomiting, or unexplained low blood pressure
- Cloudy peritoneal dialysis fluid
- New ascites, especially during a hospital admission
- A sudden decline in someone with liver, kidney, or abdominal disease
- Concern about bowel leakage, a perforation, or infection after surgery

Who should have the test

You may need this test if you have abdominal fluid and your healthcare team suspects infection. It is also commonly considered when ascites first appears or when someone with cirrhosis and ascites becomes unwell or is admitted to hospital.

People receiving peritoneal dialysis may need testing when drained fluid becomes cloudy or when abdominal pain, fever, nausea, or other features suggest dialysis-related peritonitis.

The test is not used to screen people who do not have peritoneal fluid. Whether sampling is appropriate depends on your symptoms, medical history, examination, imaging, and the safety of collecting the fluid.

How to prepare

Fasting is usually unnecessary for a straightforward paracentesis. If sedation or another procedure is planned at the same time, follow the specific eating and drinking instructions you receive.

Tell the healthcare team about your medicines, especially blood thinners and medicines that affect platelets. Do not stop a prescribed medicine unless you are specifically told to do so.

You may be asked to empty your bladder before paracentesis. Ultrasound is often used to locate the fluid and choose a safe place for the needle.

If the sample will come from a peritoneal dialysis catheter, follow the collection instructions from your dialysis unit. Avoid touching sterile connections or collecting fluid from an old drainage bag unless instructed.

What happens during the test

For paracentesis, you usually lie on your back or partly upright. The skin is cleaned, and a local anaesthetic numbs the area. You may feel brief stinging from the anaesthetic, followed by pressure as the needle or tube enters.

A small amount of fluid is removed into sterile containers. Some fluid may be placed directly into blood culture bottles beside the bed because prompt inoculation can improve the chance of finding bacteria.

The needle or tube is then removed, and a dressing is applied. The sample may also be tested for white blood cells, protein, albumin, glucose, or other substances.

For peritoneal dialysis, drained dialysis fluid is collected using a sterile method. A needle through the abdominal wall is generally not needed.

Understanding your results

A result may be reported as no growth or as the name of an organism that grew.

A positive culture can support a diagnosis of peritonitis when it fits your symptoms and the fluid's white blood cell count. The report may include susceptibility testing , which shows whether the organism is likely to respond to particular antimicrobial medicines.

A positive result does not always prove infection. Organisms from the skin or collection equipment can enter the sample accidentally. Your healthcare team considers the organism, how many samples were positive, the collection method, and your other findings.

A no-growth result does not rule out infection. Treatment may be needed before the final result if the fluid has many neutrophils, which are white blood cells that increase during bacterial infection.

This culture does not have a universal numerical reference range. Ranges for related fluid tests

and their interpretation vary by laboratory, age, sex, pregnancy status, medicines, and clinical context.

What affects the results

Several factors can prevent organisms from growing even when infection is present:

Collecting a fresh, sterile sample matters. Fluid taken from an old drainage bag or long-standing surgical drain may grow organisms that colonised the equipment rather than organisms causing infection.

Some microorganisms grow slowly or require special laboratory conditions. The laboratory needs relevant information about recent surgery, bowel problems, immune suppression, travel, and suspected tuberculosis or fungal infection so that suitable tests can be selected.

- Antibiotics like amoxicillin or doxycycline taken before the sample was collected
- Too little fluid being sent to the laboratory
- Delay before placing the fluid into culture bottles
- Poor storage or delayed transport
- Exposure to oxygen when oxygen-sensitive bacteria are suspected
- Failure to request special cultures for fungi or tuberculosis bacteria
- Short dialysis-fluid dwell time before a peritoneal dialysis sample

Accuracy and limitations

Culture can identify the organism causing an infection and help guide treatment. However, it misses some genuine infections. Prior antibiotics, low numbers of organisms, small samples, and handling delays are important reasons for a false-negative result.

The test can also say that an organism is present when it is not causing disease. This usually happens through contamination from skin, equipment, or a non-sterile collection site. A single unexpected skin organism may therefore need cautious interpretation.

A fluid white blood cell count with a differential count is often better for deciding quickly whether inflammation consistent with peritonitis is present. Culture is better for identifying the organism, but it takes longer.

Blood cultures may find an infection that the fluid culture misses. Imaging, surgical assessment, or additional fluid tests may be more useful when a bowel perforation, abscess, or

another secondary cause is possible. Special molecular or culture tests may be needed for tuberculosis, fungi, or unusual bacteria.

Risks and complications

Paracentesis commonly causes brief discomfort, a small bruise, or minor fluid leakage from the puncture site. Some people feel light-headed during or shortly after the procedure.

Bleeding, infection introduced by the procedure, and injury to an abdominal organ are uncommon. Removing a large volume of fluid can affect blood pressure and circulation, but this is less relevant when only a small diagnostic sample is taken.

Collecting fluid through an existing peritoneal dialysis catheter does not involve a new skin puncture. Careful sterile technique is important because contamination can introduce infection.

What happens next

A preliminary report may become available before the culture is complete. If an organism grows, identification and susceptibility results may follow later. Some fungal and other special cultures take longer.

If your result is negative and you are otherwise well, follow-up may involve reviewing the cell count, symptoms, imaging, and other laboratory results. A repeat sample is sometimes considered when symptoms continue or treatment is not working as expected.

Do not wait for a final culture result if you have worsening abdominal pain, fever, repeated vomiting, new confusion, or cloudy peritoneal dialysis fluid. Seek urgent medical assessment.

Call emergency services for severe breathing difficulty, collapse, marked drowsiness, or signs of shock such as cold clammy skin with faintness or confusion.

Common questions

Can I drink coffee before the test?

Usually, yes. Fasting is not normally needed for diagnostic paracentesis. Do not eat or drink if you were given fasting instructions for sedation or another planned procedure.

Does the time of day matter?

No particular time of day is required. Collecting the sample promptly when infection is

suspected-and preferably before antibiotics when this can be done safely-is more important.

Can I exercise beforehand?

Ordinary exercise does not directly change whether organisms grow. If your abdomen is painful or swollen, avoid activity that worsens your symptoms and follow the instructions provided for the procedure.

Will antibiotics affect the result?

Yes. Antibiotics can stop organisms from growing and cause a negative culture despite infection. Tell the healthcare team about recent antibiotics, but do not delay or stop treatment on your own.

Why is my culture negative if my healthcare team says I have peritonitis?

Some infections are culture-negative. Antibiotics, low organism numbers, or collection issues may prevent growth. The diagnosis can still be supported by symptoms and a raised neutrophil count in the fluid.

How long will the final result take?

Common bacteria may be detected within one or two days, but final identification and susceptibility testing can take several days. Slow-growing bacteria, fungi, and tuberculosis testing may take longer.

Sources

- Biggins SW, Angeli P, Garcia-Tsao G, et al. Diagnosis, Evaluation, and Management of Ascites, Spontaneous Bacterial Peritonitis and Hepatorenal Syndrome: 2021 Practice Guidance by the American Association for the Study of Liver Diseases . Hepatology . 2021;74(2):1014-1048.
- Li PK-T, Chow KM, Cho Y, et al. ISPD peritonitis guideline recommendations: 2022 update on prevention and treatment . Peritoneal Dialysis International . 2022;42(2):110-153.
- UK Health Security Agency. Investigation of fluids from normally sterile sites: UK Standards for Microbiology Investigations B 26 . Government of the United Kingdom.
- MedlinePlus. Peritoneal fluid culture . U.S. National Library of Medicine.
- Merck Manual Professional Edition. Paracentesis . Merck & Co.