TEST

Bronchoscopic culture

A bronchoscopic culture checks a lower-airway sample for microorganisms that may cause infection.

WHAT IT MEASURES
Microorganisms growing from samples collected inside the lungs

SAMPLE
Lower-airway fluid, washings, brushings, or small tissue samples

FASTING NEEDED?
Usually yes, before bronchoscopy as instructed

HOW LONG IT TAKES
Usually 30 to 60 minutes, plus recovery

RESULTS IN
Several days; fungal or mycobacterial cultures take weeks

USED FOR
Diagnosing suspected lung infection and guiding treatment

MAIN LIMITATION
Contamination or colonization can look like infection

Overview

A bronchoscopic culture looks for bacteria, fungi, or mycobacteria in a sample collected from inside your lungs. Mycobacteria include the germs that cause tuberculosis and related infections.

The sample is obtained during bronchoscopy. A clinician passes a thin, flexible viewing tube called a bronchoscope through your nose or mouth and into your airways. Sedation and numbing medicine are usually used.

A common sampling method is bronchoalveolar lavage, or BAL. Sterile salt water is passed into a small area of lung and suctioned back. Washings, brushings, mucus, or small tissue samples may also be collected.

The laboratory tries to grow and identify microorganisms. It may test which medicines are likely to work. Microscopy, molecular tests, or microbial protein tests may also be performed.

Why the test is ordered

A bronchoscopic culture may be ordered when a lung infection is suspected but a cough sample has not provided a clear answer. It collects material from deeper in the lungs or from a specific abnormal area seen on imaging.

It may help investigate:

Results may help distinguish infection from other lung conditions and guide more targeted treatment.

- Pneumonia that is severe, unusual, or not improving
- Infection in someone with a weakened immune system
- Possible tuberculosis, fungal infection, or nontuberculous mycobacterial infection
- An abnormal chest X-ray or CT scan that could represent infection
- Repeated infections in the same part of a lung

Who should have the test

Bronchoscopic culture is not a routine screening test. It is generally considered when identifying an organism could change treatment and a less invasive sample, such as coughed-up sputum, is unavailable or inadequate.

Whether bronchoscopy is appropriate depends on your breathing, oxygen level, medical conditions, imaging findings, and the likely benefit. Pregnancy, bleeding risk, allergies, and medicines affecting clotting or sedation must also be considered.

Sometimes sputum testing, nose or throat swabs, blood cultures, or molecular tests can provide an answer without bronchoscopy.

How to prepare

Follow the bronchoscopy unit's instructions. You will usually need to stop eating and drinking for several hours because sedation can increase the risk of stomach contents entering your lungs. Exact fasting times vary.

Tell the team about all medicines and supplements you use, especially blood thinners like warfarin or apixaban , antiplatelet medicines, insulin, and other diabetes medicines. Do not stop prescribed medicine unless specifically instructed.

Also tell the team if you:

Arrange transport home if you will receive sedation. You may need someone to stay with you afterward. Remove dentures or removable dental appliances when asked.

- Could be pregnant
- Have medicine or latex allergies
- Have had difficulty with sedation or anesthesia
- Use oxygen or breathing support
- Have a bleeding disorder

What happens during the test

Before the procedure, your pulse, blood pressure, and oxygen level are checked. Numbing medicine may be sprayed into your nose and throat. Sedation is often given through a vein.

The bronchoscope is gently guided into your airways. You can breathe around it, although you may feel pressure or an urge to cough.

For BAL, sterile salt water is passed into a selected airway and suctioned into a container. The returned fluid contains material from the small airways and air sacs. Other samples may be taken if needed.

Afterward, you are monitored while the sedation wears off. Do not eat or drink until the throat numbness has resolved and the team says it is safe.

Understanding your results

A positive culture means that a microorganism grew from the sample. The report may name it, describe the amount of growth, and include susceptibility results showing which medicines affected it in the laboratory.

Growth does not always prove infection. Some microorganisms can live in the airways without causing illness, known as colonization. Others may enter the sample as the bronchoscope passes through the mouth or throat.

A negative result does not completely rule out infection. The organism may have been present in low numbers, outside the sampled area, affected by earlier treatment, or unable to grow under routine conditions.

There is no universal reference range. Results must be interpreted with symptoms, imaging, other tests, medicines, and medical history.

What affects the results

Antibiotics like amoxicillin or doxycycline , antifungal medicines, or tuberculosis treatment taken before bronchoscopy can reduce microbial growth. Tell the team about recent and current treatment.

Other factors include:

Tell the team if a particular organism is suspected so the laboratory can use the appropriate tests and safety procedures.

- Sampling location: A patchy infection may be missed
- Sample type and amount: Small or diluted samples may contain fewer organisms
- Contamination: Mouth or throat organisms can enter the sample
- Colonization: Organisms may live in damaged airways without causing active infection
- Transport conditions: Delays or unsuitable temperatures can affect fragile organisms
- Culture requested: Fungi and mycobacteria need specialized methods and longer incubation

Accuracy and limitations

Bronchoscopy can sample deeper and more targeted areas than ordinary sputum collection, but there is no single accuracy figure. Performance depends on the organism, sample method, infection location, previous treatment, and laboratory technique.

The culture may miss infection if the wrong area is sampled or treatment has reduced growth. Slow-growing or difficult-to-grow organisms may also be missed.

Conversely, contamination or colonization may produce growth that does not represent disease. No result or organism count should be interpreted alone.

Additional testing may include molecular or antigen tests, blood cultures, sputum tests, or microscopic examination of tissue. A biopsy may be needed when cancer, inflammation, or infection within lung tissue is being considered.

Risks and complications

Most risks come from bronchoscopy and sedation rather than the culture. Common short-term effects include a sore throat, hoarse voice, cough, sleepiness, and a small amount

of blood-streaked mucus.

Oxygen levels may fall temporarily. Less common complications include breathing difficulty, airway tightening, bleeding, an abnormal heart rhythm, or a reaction to sedation. A collapsed lung is uncommon and is more closely associated with lung biopsy than with lavage alone.

Seek emergency help for severe trouble breathing, severe or worsening chest pain, fainting, blue or grey lips, or coughing up more than a small amount of blood.

Contact the bronchoscopy team promptly for persistent or rising fever, worsening breathlessness, increasing blood in mucus, or symptoms that are not settling as described in your discharge instructions.

What happens next

Routine bacterial results may become available over several days. Fungal and mycobacterial cultures can take several weeks because these organisms grow slowly.

Your care team will consider the result alongside symptoms, examination, imaging, blood tests, microscopy, and molecular testing. Treatment may begin before the final culture if waiting would be unsafe.

Preliminary or final results may lead to a change in medicine. If no organism grows but concern remains, next steps may include repeat imaging, another sample, molecular testing, or biopsy.

Common questions

Can I drink coffee before a bronchoscopy?

Usually not during the fasting period, even if it is black. Follow your unit's instructions because permitted clear fluids and stop times differ.

Does the time of day affect the culture?

Usually not. Scheduling is based more on fasting, sedation, and prompt delivery of the sample to the laboratory.

Can I exercise beforehand?

Exercise does not usually change what grows. Avoid activity that worsens breathlessness, and follow instructions about oxygen, fasting, and arrival time.

Will I be awake?

Many people receive conscious sedation, so they are sleepy and relaxed but not under general

anesthesia. Deeper sedation or anesthesia may sometimes be used.

Can I drive home afterward?

Not after sedation. Arrange transport and follow restrictions on driving, machinery, alcohol, and important decisions.

Why are my results taking so long?

Routine bacteria often grow within days. Fungi and mycobacteria may need weeks before a reliable final result is available.

Sources

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