PROCEDURE

Endoscopic ultrasound

Endoscopic ultrasound uses a flexible camera and ultrasound to examine the digestive tract and nearby organs

PURPOSE
Examine digestive organs closely and sometimes collect tissue

PROCEDURE TYPE
Diagnostic or therapeutic; minimally invasive endoscopic procedure

WHERE IT IS DONE
Endoscopy suite, sometimes an operating theatre

ANAESTHESIA
Moderate or deep sedation, sometimes general anaesthesia

HOW LONG IT TAKES
About 30 to 90 minutes

PREPARATION
Fasting; bowel preparation or medication changes when instructed

RECOVERY
Usually same day; no driving after sedation

MAIN RISKS
Bleeding, infection, pancreatitis, perforation, sedation reactions

RESULTS
Images immediately; tissue results usually within several days

Overview

Endoscopic ultrasound, or EUS, combines endoscopy with ultrasound imaging. An endoscope is a thin, flexible tube with a light, camera, and ultrasound device at its tip.

The endoscope usually passes through your mouth to examine the oesophagus, stomach, and first part of the small intestine. For some conditions, it passes through the anus to examine the rectum and nearby structures.

Ultrasound uses sound waves to create pictures. Because the ultrasound device can sit close to the area being examined, EUS can show the layers of the digestive tract and nearby organs in detail. These may include the pancreas, bile ducts, gallbladder, liver, lymph nodes, and blood vessels.

If needed, the clinician may pass a fine needle through the endoscope to collect cells, tissue, or fluid. This is called fine-needle aspiration or fine-needle biopsy. EUS can also guide treatments, such as draining certain fluid collections.

Why the procedure is performed

EUS may be offered when another scan or endoscopy has found something that needs a closer look. It can also help investigate symptoms or abnormal blood test results when the cause remains unclear.

Common reasons include:

EUS may help plan surgery or other treatment. However, an ultrasound image alone cannot always show whether an abnormal area is cancerous. A tissue sample may be needed.

- Examining a lump, cyst, or thickened area in or near the digestive tract
- Looking closely at the pancreas, bile ducts, or gallbladder
- Checking whether a growth has entered deeper tissue layers
- Examining nearby lymph nodes
- Collecting tissue to determine what an abnormal area contains
- Looking for small bile duct stones that other scans may miss
- Assessing long-term pancreatic inflammation
- Draining selected pancreatic fluid collections or other abnormal collections

Who should and should not have it

EUS may be suitable if its detailed images or tissue sampling are likely to affect your diagnosis, treatment, or follow-up plan. Your healthcare team should explain what question the procedure is intended to answer and whether a needle or treatment may be used.

It may not be the right test if a less invasive scan can provide enough information. It may also offer little benefit if the result would not change your care.

The procedure may need to be avoided or delayed if:

Pregnancy does not automatically rule out EUS, but the timing, sedation, and need for the procedure require careful consideration. Tell the team if you are or may be pregnant.

- You have a serious uncontrolled heart or breathing problem

- You have an acute illness that makes sedation unsafe
- You have a severe bleeding disorder, especially if tissue sampling is planned
- There may be a tear or complete blockage in the digestive tract
- Food or stool preparation has not been completed safely
- You are taking medication that raises bleeding risk and no safe plan has been made
- You cannot safely receive the planned sedation or anaesthetic

How to prepare

Your treating facility's own instructions take priority because preparation differs for upper and lower EUS and for procedures involving tissue sampling.

For an upper EUS, you will usually need to stop eating and drinking for several hours so the stomach is empty. A rectal EUS may require laxatives, an enema, or other bowel preparation.

Give the team an up-to-date list of medicines, supplements, and allergies. Tell them if you take blood thinners like warfarin or apixaban , medicines for diabetes, or medicines that affect appetite and stomach emptying. Do not stop a prescribed medicine unless the treating team gives you a specific plan.

Tell the facility about heart or lung conditions, bleeding problems, previous sedation reactions, implanted medical devices, and pregnancy.

If you will receive sedation or general anaesthesia, arrange for a responsible adult to take you home. You may also need someone to stay with you for a period afterward.

What happens during the procedure

Before EUS, the team will confirm your identity, planned procedure, allergies, and consent. An intravenous line is usually placed in your arm for sedation and other medicines. Monitoring devices check your breathing, pulse, blood pressure, and oxygen level.

For upper EUS, you may receive a throat-numbing spray. A mouth guard protects your teeth and the endoscope. You will usually lie on your side while the endoscope passes through your mouth. It does not enter your windpipe, although you may notice pressure or gagging before the sedation takes full effect.

For rectal EUS, the lubricated endoscope passes gently through the anus.

The clinician moves the ultrasound tip near the area being examined. Water may be placed in

the digestive tract or a small balloon may be filled around the tip to improve the ultrasound image.

If a sample is needed, a thin needle passes through the wall of the digestive tract under ultrasound guidance. More than one sample may be taken. Some samples are examined as cells, while others preserve a small core of tissue.

A therapeutic EUS may take longer because it can involve placing a drain or creating a controlled passage into a fluid collection.

Recovery and what to expect afterward

Mild throat soreness, bloating, or cramping can occur. These effects usually settle within a short time. Rectal EUS may cause temporary pressure or minor discomfort.

You can usually eat and drink once you are fully awake and the team says it is safe. Start with what feels comfortable. Follow any special diet instructions if a biopsy, drainage procedure, or another treatment was performed.

Plan to rest for the remainder of the day. Avoid strenuous activity for as long as your discharge instructions recommend, particularly after tissue sampling or treatment.

Do not drive, cycle on public roads, operate machinery, drink alcohol, or make important legal or financial decisions for the period specified after sedation-commonly until the following day. You will need someone else to take you home.

Many people return to desk-based work the next day. You may need longer after a therapeutic procedure, general anaesthesia, or physically demanding work.

Risks and possible complications

Most people recover without a serious problem. The risks are higher when EUS includes a needle procedure or treatment than when it involves imaging alone.

Possible complications include:

Your personal risk is influenced by the area being examined, the intervention planned, your medical conditions, and medicines that affect bleeding. Ask how the expected benefit compares with these risks in your situation.

- A reaction to sedation or anaesthesia, including breathing or heart problems
- Bleeding, particularly after tissue sampling or treatment

- Infection after sampling or draining certain cysts or fluid collections
- Pancreatitis, meaning inflammation of the pancreas
- Perforation, meaning a tear in the oesophagus, stomach, intestine, or rectum
- Damage to nearby organs or blood vessels during needle or drainage procedures
- An incomplete examination or a sample that does not provide an answer

Results and follow up

The clinician can usually describe the main imaging findings after you are awake. Sedation can make details difficult to remember, so written information or having another person present can help.

Biopsy, cell, or fluid results take longer because a laboratory must process and examine the sample. This commonly takes several days, but specialised tests may take longer.

Routine follow-up may involve a clinic visit, telephone call, repeat scan, or discussion with a specialist team. Before leaving, ask who will give you the final result and when you should expect it. Contact the facility if that time passes without an update.

A normal or unclear sample does not always settle the question. Depending on the finding, your team may recommend monitoring, repeat sampling, another type of biopsy, or surgery.

Alternatives

The alternatives depend on what the EUS is intended to find or treat.

CT and MRI scans examine a wider area without passing an endoscope into your body. MRI-based MRCP is particularly useful for the bile and pancreatic ducts. These scans may provide less detail for very small abnormalities and cannot usually collect tissue.

A standard upper endoscopy or colonoscopy shows the inner lining of the digestive tract clearly. It does not usually show deeper wall layers or nearby organs as well as EUS.

An ultrasound performed through the skin is simple and non-invasive, but bowel gas and body tissues may block detailed views of the pancreas or bile ducts.

A biopsy through the skin, guided by CT or ultrasound, may reach some abnormalities without endoscopy. It may not provide a safe or direct route to every lesion.

ERCP uses an endoscope and X-rays to treat bile or pancreatic duct problems, such as blockages. It can remove stones or place stents, but it is more invasive and is not generally

used merely to replace diagnostic EUS.

Surgery or laparoscopy can provide tissue and treatment at the same time, but recovery and procedural risks are greater. For selected low-risk findings, monitoring with repeat imaging may avoid an immediate procedure but provides less certainty now.

When to call your healthcare team

For routine questions, contact the endoscopy team if mild throat discomfort, bloating, or altered bowel habits are not improving, or if you have questions about eating, medicines, work, or results.

Seek urgent medical advice after EUS if you develop:

Call emergency services for severe breathing difficulty, fainting, confusion, severe chest or abdominal pain, or heavy bleeding.

- Increasing or persistent abdominal, chest, neck, or back pain
- Fever, chills, or feeling increasingly unwell
- Repeated vomiting or difficulty swallowing
- Vomiting blood or passing black or clearly bloody stool
- Increasing abdominal swelling
- Redness, drainage, or worsening pain around an external drain

Common questions

Will I be asleep?

Many people receive moderate or deep sedation and remember little of the procedure. You may not be completely unconscious. General anaesthesia is used for some longer or more complex procedures.

Can I drive home?

No. If you receive sedation or general anaesthesia, arrange for someone else to take you home. Follow the facility's instructions about when you may drive again.

How painful is endoscopic ultrasound?

The procedure should not be sharply painful. You may feel throat pressure, gagging, bloating, or rectal pressure. Sedation and, for upper EUS, throat-numbing medicine help reduce

discomfort.

When will I know the results?

The clinician can often explain the ultrasound findings the same day. Laboratory results from tissue or fluid samples usually take several days and may take longer if special testing is required.

Is EUS the same as a standard endoscopy?

No. Both use a flexible endoscope, but EUS also has an ultrasound device that shows deeper tissue layers and organs outside the digestive tract.

Does having a biopsy mean cancer is suspected?

Not necessarily. Samples are taken for many reasons, including distinguishing inflammation, cyst fluid, benign growths, and cancer. The laboratory result must be considered alongside the scans and your clinical history.

Sources

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