PROCEDURE

Pericardiocentesis

Pericardiocentesis uses a needle and catheter to drain fluid from around the heart

PURPOSE
Drain fluid around the heart and test its cause

PROCEDURE TYPE
Both; minimally invasive, image-guided needle and catheter drainage

WHERE IT IS DONE
Cardiac procedure room, operating theatre, or bedside

ANAESTHESIA
Local anaesthetic, sometimes with moderate sedation

HOW LONG IT TAKES
Usually 30 to 60 minutes

PREPARATION
Blood tests, imaging, fasting, and blood thinner review

RECOVERY
Same day or overnight; no driving after sedation

MAIN RISKS
Bleeding, heart injury, abnormal rhythm, collapsed lung

RESULTS
Pressure relief immediately; fluid tests often take days

Overview

Pericardiocentesis is a procedure that removes fluid from the space around your heart. This space is inside a thin, protective sac called the pericardium.

A small amount of fluid is normally present. An abnormal collection is called a pericardial effusion. If enough fluid builds up, it can press on the heart and prevent it from filling and pumping normally. Severe pressure is called cardiac tamponade and may require emergency drainage.

During pericardiocentesis, a clinician guides a needle into the fluid using imaging, usually an echocardiogram. An echocardiogram uses sound waves to show the heart. A thin tube called a catheter may then be left in place while the fluid drains.

The procedure can relieve pressure and provide fluid for laboratory testing.

Why the procedure is performed

Pericardiocentesis may be recommended to:

Emergency pericardiocentesis is most often performed when fluid is causing cardiac tamponade. In a non-emergency setting, the decision also considers the amount and location of fluid, your symptoms, test results, and the suspected cause.

Not every pericardial effusion needs drainage. Small, stable collections can sometimes be monitored while the underlying condition is treated.

- Relieve pressure that is affecting how your heart works
- Treat a large or symptomatic pericardial effusion
- Test fluid for infection, cancer cells, blood, or inflammation
- Drain fluid that continues to increase despite other treatment
- Help determine why an unexplained effusion developed

Who should and should not have it

Pericardiocentesis may be appropriate if fluid is placing dangerous pressure on your heart, causing significant symptoms, or needs to be tested to guide treatment.

In cardiac tamponade, there may be no safer reason to delay drainage. When the situation is less urgent, your team will weigh the likely benefit against the procedural risks.

A planned pericardiocentesis may be delayed or replaced by another approach if:

Surgery is often preferred when bleeding around the heart is caused by major trauma, a tear in the aorta, or a rupture of the heart muscle. Surgery may also be more suitable when tissue is needed for diagnosis or the fluid repeatedly returns.

These are not absolute rules. Imaging and the urgency of your condition are important parts of the decision.

- There is too little fluid or no safe route for the needle
- The fluid is divided into small pockets that are difficult to reach
- You have an untreated bleeding problem or very low platelets
- You are taking medicines that substantially increase bleeding risk
- There is an infection over the proposed needle entry site

- Previous heart surgery or scarring makes needle drainage difficult

How to prepare

Your treating facility's own instructions take priority because preparation differs between emergency and planned procedures. In an emergency, there may be little or no time to prepare.

For a planned procedure, you may have an echocardiogram, electrocardiogram, chest imaging, and blood tests. Blood tests can check your blood count, kidney function, and how well your blood clots.

Tell the team about all medicines, supplements, allergies, bleeding conditions, and previous reactions to anaesthesia. Blood thinners like warfarin or apixaban may need adjustment, but do not stop them unless the treating team specifically tells you to.

You may be asked not to eat or drink for several hours, especially if sedation is planned. Follow the exact fasting instructions provided by the facility.

Arrange for someone to take you home if you will receive sedation. Remove jewellery as directed and expect to change into a hospital gown.

What happens during the procedure

You will usually lie on your back with your upper body raised. Heart rhythm, blood pressure, oxygen level, and breathing are monitored throughout.

The team uses an echocardiogram to locate the fluid and choose the safest route. Fluoroscopy, which is a moving X-ray, or CT imaging may sometimes be used instead.

The skin on your chest is cleaned and covered with sterile drapes. A local anaesthetic numbs the entry area. You may feel brief stinging and pressure. Sedation may help you relax, although you may remain awake and able to respond.

A needle is carefully advanced toward the fluid. The entry point may be below the breastbone, near the heart's tip on the left side of the chest, or beside the breastbone. Imaging and electrical monitoring help guide its position.

A flexible guidewire is passed through the needle, followed by a drainage catheter. The needle is then removed. Some fluid may be collected immediately for testing.

The catheter may be removed at the end of the procedure or secured in place for continued drainage. If it remains, the amount and appearance of fluid are monitored. A follow-up echocardiogram checks how much fluid remains.

Recovery and what to expect afterward

Mild soreness, bruising, or tenderness at the entry site is common. Tell the team if pain is increasing, deep, or accompanied by breathlessness. Use only pain relief approved for you, particularly if bleeding is a concern.

You can usually drink and eat once you are fully alert and not nauseated. Your team may recommend a different plan if another procedure or surgery is possible.

Activity is limited while a drainage catheter is present. After its removal, avoid strenuous exercise and heavy lifting until the treating team says the entry site and your condition are stable.

You cannot drive home after sedation. Follow the facility's instructions about when driving is safe again. Even without sedation, driving may not be appropriate if you are unwell or still being assessed.

Returning to work depends on why the fluid developed, whether a catheter remains, and whether further treatment is needed. A short recovery may be enough for desk work after an uncomplicated procedure. Physical work or treatment of a serious underlying condition may require more time.

Some people go home the same day. Others stay overnight or longer for monitoring and continued drainage.

Risks and possible complications

Imaging guidance reduces risk, but pericardiocentesis can cause complications. These include:

Rarely, the lungs can develop fluid after pressure around the heart is relieved, particularly after a large effusion is drained. Severe bleeding, cardiac arrest, and death are possible but uncommon.

Your individual risk is influenced by the fluid's location, the reason it developed, previous surgery, bleeding risk, and whether the procedure is performed during an emergency.

- Bleeding into the pericardial space or chest
- Puncture or injury to the heart or a coronary blood vessel
- An abnormal heart rhythm
- Injury to a lung, causing air around it
- Injury to the liver, stomach, or nearby structures

- Infection at the entry site or within the pericardial space
- A sudden blood pressure drop
- Fluid returning after the catheter is removed

Results and follow up

Relief of pressure can often be seen immediately on an echocardiogram. Blood pressure, breathing, and other effects may improve soon after drainage, although recovery also depends on the underlying condition.

The fluid may be checked for:

Some results are available within hours. Cultures and cell testing may take several days or longer.

Follow-up commonly includes another echocardiogram, review of the entry site, and discussion of laboratory results. Treatment then focuses on the reason for the effusion. Further imaging may be arranged to check whether fluid is returning.

- Blood and inflammatory cells
- Bacteria, fungi, or other signs of infection
- Protein and other chemical features
- Abnormal or cancerous cells

Alternatives

The alternatives depend on whether drainage is urgent.

Observation with repeat echocardiograms may be reasonable for a small, stable effusion without major pressure on the heart. This avoids an invasive procedure but does not provide fluid for testing and may allow the effusion to grow.

Medicines can treat some causes, such as inflammation or infection. They do not remove dangerous pressure quickly and are not a substitute for drainage in cardiac tamponade.

A surgical pericardial window removes or opens part of the pericardium so fluid can drain. It requires an operation and a longer recovery, but may provide more lasting drainage and allows tissue biopsy.

Open surgical drainage may be safest for traumatic bleeding, suspected heart or aortic rupture, thick material, or fluid that cannot be reached with a needle. It is more invasive but

gives the surgeon direct access to control bleeding and inspect the area.

When to call your healthcare team

Attend routine follow-up for repeat imaging, wound review, and laboratory results. Mild, improving tenderness at the entry site can usually be discussed at this visit.

Contact your healthcare team promptly if you develop:

Call emergency services for severe or rapidly worsening breathlessness, fainting, confusion, blue or grey lips, heavy bleeding, or intense chest pain. Do not drive yourself if you feel faint or seriously unwell.

- Fever, spreading redness, warmth, swelling, or drainage at the site
- Increasing chest discomfort or breathlessness
- New or persistent palpitations
- Bleeding that does not stop with gentle pressure
- A drainage catheter that moves, disconnects, or stops draining unexpectedly

Common questions

Will I be asleep?

Usually not. Local anaesthetic numbs the skin, and you may receive medicine that makes you relaxed and drowsy. General anaesthesia is more likely if surgical drainage is needed.

Can I drive home?

Not if you received sedation. Arrange for an adult to take you home and follow the facility's driving restrictions. Hospital admission may be needed if the catheter remains in place.

How painful is pericardiocentesis?

The numbing injection can sting briefly. You may then feel pressure as the needle and catheter are placed. Increasing or sharp pain should be reported immediately.

When will I know if it worked?

Imaging shows immediately whether fluid has been removed and pressure has improved. Symptom relief may also occur quickly. The reason for the fluid may not be known until laboratory tests return.

Can the fluid come back?

Yes. Recurrence depends on the underlying cause and whether that cause can be treated. Repeat drainage or a surgical pericardial window may be considered if fluid returns.

Sources

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