HEALTH BASICS

ICD

An ICD is an implanted device that detects and treats dangerous heart rhythms.

WHAT IT IS
An implanted device that treats dangerous heart rhythms

WHERE IT COMES UP
Heart rhythm care and sudden cardiac arrest risk

WHY IT MATTERS
Lower risk from certain life-threatening heart rhythms

WHAT IT IS NOT
Not a disease or a standard pacemaker

WHO TO ASK
Cardiologist or cardiac device clinic

HOW IT IS CHECKED
Device interrogation using a wireless programmer

Overview

ICD stands for implantable cardioverter-defibrillator . It is a small electronic device placed under the skin, usually in the upper chest. It continuously checks your heart rhythm and can deliver treatment if it detects certain dangerous rhythms.

An ICD is not a disease or a diagnosis. It is also different from an automated external defibrillator, or AED, used during a cardiac arrest outside hospital.

A cardiology team may discuss an ICD if someone has survived a cardiac arrest caused by an abnormal rhythm. It may also be considered when a heart condition creates a high risk of such a rhythm. Whether an ICD is suitable is based on the person's heart condition, test results, general health and preferences.

An ICD does not cure the condition that led to it being recommended. Medicines and other heart treatments may still be needed.

How it works

Most ICDs have a pulse generator and one or more leads. The generator contains a battery and

computer. The leads are insulated wires that carry information between the device and the heart.

In a traditional ICD, the leads pass through a blood vessel into the heart. A subcutaneous ICD has a lead under the skin rather than inside the heart. These types have different capabilities, so the choice is based on the treatment a person may need.

The ICD looks for rhythms from the heart's lower chambers, called the ventricles. Two important dangerous rhythms are:

If the ICD detects a rhythm it has been programmed to treat, it may first deliver rapid, low-energy pacing. This is called antitachycardia pacing and may stop some fast rhythms without a shock.

If pacing does not work, or the rhythm requires immediate treatment, the ICD can deliver an electrical shock. People often describe a shock as a sudden thump or jolt. A person may lose consciousness from the abnormal rhythm before noticing it.

Many ICDs can also work as pacemakers when the heart beats too slowly. However, not every ICD offers the same pacing functions.

The device stores information about heart rhythms and treatments. A device clinic reads this information using a programmer placed over the skin or through remote monitoring equipment. This process is called device interrogation .

The battery cannot be charged at home. During routine checks, the clinic estimates how much battery life remains and plans generator replacement before the battery is exhausted.

- Ventricular tachycardia , an abnormally fast rhythm from the ventricles
- Ventricular fibrillation , a chaotic rhythm that stops the heart pumping effectively

Why it matters for your health

An ICD can quickly treat ventricular tachycardia or ventricular fibrillation. These rhythms can cause sudden cardiac arrest, meaning the heart abruptly stops pumping blood effectively.

An ICD may be used for secondary prevention after a person has already had a cardiac arrest or another serious ventricular rhythm. In this setting, "prevention" means reducing the chance that a future rhythm will be fatal.

It may also be used for primary prevention when tests show a high risk even though cardiac arrest has not happened. For example, the heart's pumping strength may be severely reduced because of heart muscle disease or previous damage.

The device does not prevent every abnormal rhythm from starting. It also does not treat

blocked heart arteries, repair damaged heart muscle or replace treatment for heart failure. Medicines, procedures and lifestyle advice remain important when recommended for the underlying condition.

Having an ICD can affect practical parts of life, including driving, work, travel and some medical procedures. Restrictions are based on why the ICD was implanted, whether it has delivered treatment and local licensing rules. Your device clinic can explain the rules that apply to you.

What can go wrong

Implantation can cause bruising, bleeding or discomfort around the wound. Other possible complications include infection, movement of a lead, or injury to a nearby blood vessel or lung. The implanting team should explain these risks before the procedure.

An ICD may occasionally deliver an inappropriate shock . This means it gives a shock for a rhythm that was not the dangerous ventricular rhythm it was intended to treat. This can happen because of another fast rhythm, a lead problem or incorrect sensing. Device programming and treatment of other rhythm problems can reduce this risk.

Leads may move, wear or become damaged. The generator also needs replacement when its battery approaches depletion. Routine device checks are designed to identify these situations before they interfere with treatment.

Strong magnets or electromagnetic fields can temporarily affect how an ICD senses rhythms or delivers therapy. Most everyday electrical equipment is safe when used according to its instructions. Medical procedures that may require special planning include MRI scans, surgery using electrical equipment and some forms of radiation treatment. Having an ICD does not automatically rule out an MRI; safety depends on the exact device and leads.

Some people feel anxious about receiving a shock or returning to usual activities. A shock can also be emotionally upsetting. The cardiac team can review what happened, adjust treatment when needed and arrange psychological support.

After implantation, contact the device or cardiology team promptly if the wound becomes increasingly red, swollen, hot, painful or starts draining fluid. Fever or feeling unwell with wound changes also needs prompt medical advice.

A single shock while you otherwise feel well still needs prompt contact with your device clinic. Follow the personal shock plan provided by your team.

Call emergency services if:

- The ICD delivers more than one shock close together

- A shock occurs with chest pain, severe breathlessness or fainting
- A fast heartbeat or severe symptoms continue after a shock
- You become unresponsive or appear to be in cardiac arrest

What you can do

Keep your ICD identification card with you. It records the device model and gives healthcare staff information they may need during treatment or an emergency.

Attend scheduled device checks even if you feel well. Remote monitoring can send technical and rhythm information to the clinic, but it does not replace every appointment. Do not assume that a transmission has been reviewed immediately unless your clinic has told you so.

Ask your device team for a written plan explaining what to do after a shock. Keep the clinic's contact details somewhere accessible and tell close family members where to find them.

Before a scan, operation or other procedure, tell the healthcare team that you have an ICD. Show them your device card. This includes dental treatment when electrical equipment may be used.

Ask the clinic about:

Keep taking prescribed heart medicines unless the prescribing clinician changes them. Receiving an ICD does not usually make those medicines unnecessary.

- Which type and model of ICD you have
- Whether your device and leads are suitable for MRI
- Driving, work and exercise restrictions
- How to use phones, headphones and magnetic accessories safely
- What remote monitoring does and when transmissions are reviewed
- Who to contact after a shock or if the wound changes

Common questions

Is an ICD the same as a pacemaker?

No. A pacemaker mainly treats a heartbeat that is too slow. An ICD treats certain dangerous fast rhythms and can deliver a shock. Many ICDs also include pacemaker functions.

Can you feel an ICD working?

You usually do not feel it monitoring your rhythm. Rapid pacing may not be noticeable, but a shock is often felt as a sudden, forceful jolt.

Can an ICD prevent a heart attack?

No. A heart attack happens when blood flow to part of the heart muscle is blocked. An ICD treats certain electrical rhythm problems. A heart attack can sometimes trigger a dangerous rhythm, but the ICD does not open the blocked artery.

Can you travel with an ICD?

Many people can travel. Carry your device card and any medicines in their original packaging. At security screening, identify the device and follow instructions from security staff without lingering near screening equipment.

Does an ICD need maintenance?

It needs regular checks rather than day-to-day maintenance by you. The clinic checks the battery, leads, stored rhythms and programming. The generator is replaced when the battery approaches depletion.

Can the ICD be turned off?

Its shock function can be deactivated without removing the device. This may be discussed when shocks no longer match a person's goals of care, including near the end of life. Pacing can often be considered separately. This is a planned decision with the person, their chosen supporters and the clinical team.

Sources

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