

# Irreversible electroporation (IRE) for pancreatic cancer

This fact sheet is for people who want to know more about irreversible electroporation (IRE) for pancreatic cancer. It explains what the treatment is, who it might be suitable for, what happens during treatment and possible side effects.



You can speak to our specialist nurses on our confidential Support Line about IRE. Call free on **0808 801 0707** or email **nurse@pancreaticcancer.org.uk**

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## Key facts

- During IRE treatment, needles are put in around the cancer. Electrical currents are then passed between the needles. These currents damage and destroy the cancer cells.
- NanoKnife® is the brand name for the machine used to deliver the treatment.
- There has not been much research into IRE for pancreatic cancer, so we only have limited information about how well it works.
- The National Institute for Health and Care Excellence (NICE) says that IRE should only be used in research looking at how well it works for pancreatic cancer.
- IRE may be suitable for some people with locally advanced pancreatic cancer (see page 4). This is cancer that has spread just outside the pancreas, and can't usually be removed with surgery.
- IRE may also be offered to a few people with borderline resectable pancreatic cancer (see page 4) where surgery to remove the cancer may be possible. IRE may be used to treat the cells around the edges of the tumour. The aim is to make removing the cancer as successful as possible. There is not much evidence on IRE used in this way, and we need more research into this.
- IRE aims to slow the growth of pancreatic cancer. This may help some people with locally advanced or borderline resectable cancer to live longer. It may also help treat symptoms such as pain.
- Before having IRE you will normally have three to six months of chemotherapy (see page 6).
- IRE can cause side effects such as pain, feeling and being sick, and heartburn (see page 8). These side effects don't usually last long.
- IRE can cause other side effects, such as inflammation of the pancreas (pancreatitis) or more rarely, a blood clot in a vein (see page 8).
- **As there isn't much research into IRE, if you are thinking about having it it's really important you speak to your doctor before making any decisions.**

# What is irreversible electroporation (IRE) for pancreatic cancer?

IRE for pancreatic cancer involves inserting thin needles around the cancer. Electrical currents are passed between the needles. These currents damage and destroy the cancer cells.

The aim is to slow the growth of pancreatic cancer by destroying the cancer cells. This may help people live longer and may also help control symptoms such as pain.

## Research on IRE for pancreatic cancer

**There has not been much research into IRE for people with pancreatic cancer. This means that we don't know enough about how well it works, who it is most suitable for, and the side effects and complications.**

The National Institute for Health and Care Excellence (NICE) has said that IRE should only be used in research. Researchers are setting up a clinical trial in the UK to look at IRE for pancreatic cancer. We will provide information about the trial when it's available on our Trial Finder. Until there is a clinical trial available, NHS hospitals that provide IRE are collecting information about how well it works.

**As there isn't much research into IRE, make sure you speak to your doctor before making any decisions about having it.** Ask them any questions you might have about IRE, including whether it is suitable for you, how effective it is, and the possible side effects. Don't stop any treatment while you are thinking about having IRE.



Read more about clinical trials and find our Trial Finder on our website at: [pancreaticcancer.org.uk/clinicaltrials](https://pancreaticcancer.org.uk/clinicaltrials)



You can speak to our specialist nurses on our confidential Support Line about IRE.

# Who can have IRE?

## Locally advanced pancreatic cancer

IRE may be suitable for some people with locally advanced pancreatic cancer. This is cancer that has spread outside the pancreas to large blood vessels or a number of lymph nodes. It can't usually be removed by surgery. The aim of IRE is to slow the growth of the cancer, help people live longer and treat symptoms.



Read more about locally advanced pancreatic cancer on our website at: [pancreaticcancer.org.uk/stage3](https://pancreaticcancer.org.uk/stage3)

## If your cancer is close to major blood vessels (borderline resectable pancreatic cancer)

In some hospitals that provide IRE, it may be suitable for a small number of people with borderline resectable pancreatic cancer. This is cancer that has grown very close to large blood vessels near the pancreas. It may be possible to remove the cancer with surgery, but it depends which blood vessels are affected.

During surgery to remove the cancer, IRE may be used for margin accentuation. This means that the IRE is used to treat the cells around the edges of the tumour before it is removed. The aim is to try to make the surgery as successful as possible. Margin accentuation should be done as part of research.

Some people with borderline resectable cancer may be offered surgery to remove the cancer. But during the operation the surgeon finds the cancer has grown too close to the large blood vessels to remove it. Although it's not possible to remove the cancer, if the hospital provides IRE it may be used during the operation to treat it. The aim is to try to slow down the growth of the cancer. You may then be offered chemotherapy once you have recovered from the operation. If this is an option for you, your doctor will discuss this with you before your surgery. IRE used in this way should be done as part of research.

**We don't know much about IRE for borderline resectable pancreatic cancer and we need more research into this.**



Read more about borderline resectable pancreatic cancer on our website at: **[pancreaticcancer.org.uk/stage3](http://pancreaticcancer.org.uk/stage3)**

Read about surgery for pancreatic cancer at: **[pancreaticcancer.org.uk/surgery](http://pancreaticcancer.org.uk/surgery)**

## What else can affect whether I can have IRE?

There are other things that can affect whether IRE is suitable for you. For example, you will need to be fit enough to have a general anaesthetic. It may also depend on what other treatments you have already had, or how big the tumour is. It can be difficult to treat the whole tumour with IRE if it is larger.

IRE may not be suitable if you have an irregular heartbeat (atrial fibrillation), a pacemaker or other types of heart problems such as congestive heart failure or coronary artery disease. This is because the electrical currents can affect your heartbeat. Speak to your doctor about this. They may need to do an assessment to check whether you are fit enough for IRE.

Speak to your doctor about whether IRE might be an option for you and what it involves before making any decisions about your treatment.

## How can I have IRE?

At the moment, IRE is only available in a few NHS hospitals. If it may be suitable for you, but isn't available at your hospital, speak to your doctor about your options. They may be able to refer you to another hospital that does provide IRE.



You can speak to our specialist nurses on our free Support Line about IRE and how to access it.

# What does IRE involve?

This is general information about what IRE involves. Treatment may vary in different hospitals and may depend on your own situation. Speak to your doctor about the treatment, what's involved, and the risk of any side effects before you agree to have IRE.

## Before treatment

You will normally have three to six months of chemotherapy before having IRE. If you have already had chemotherapy or chemoradiotherapy you may not need any more treatment before having IRE.

You will have a CT scan to check the size and position of your cancer before having the IRE.



Read more about chemotherapy and chemoradiotherapy at: [pancreaticcancer.org.uk/chemotherapy](http://pancreaticcancer.org.uk/chemotherapy)

Read more about CT scans at: [pancreaticcancer.org.uk/tests](http://pancreaticcancer.org.uk/tests)

## What happens during treatment?

You will have a general anaesthetic (so that you are asleep and can't feel anything), and a drug to relax your muscles.

There are two ways the treatment can be done.

- The doctors may make a large cut in your tummy so they can see the pancreas and the cancer. They will place two to six needles (depending on the size and position of the tumour) around the tumour. They will use an ultrasound scan to help make sure the needles are in the right place before giving the IRE. This is called open IRE.
- Or the doctors may make two to six very small cuts in the skin of your tummy. They will then place the needles around the tumour using CT scans to guide them. This is called percutaneous IRE.

Your doctor will talk to you about how they will carry out the IRE.

Once the needles are in place, short pulses of electricity are passed between them. The needles may then be moved and the process repeated until the whole tumour and some of the surrounding area has been treated.

The electrical pulses can affect the heartbeat. To prevent this happening, your heart will be monitored during the treatment. Doctors use ECG (electrocardiography) monitoring so that the electrical pulses are delivered between heartbeats when the heart is least affected by the electrical currents.

## **Will I have to stay in hospital?**

You may have to stay in hospital for a couple of days or longer depending on whether you have open or percutaneous IRE. This is to make sure that you have recovered from the general anaesthetic and aren't in any pain or discomfort.

If you had IRE as part of an operation to remove the cancer, you may need to stay in hospital for about 10 days or longer, depending on your recovery and any complications.

## **Check-ups after treatment**

You will have a check-up soon after your treatment to see how you are. You will then have a CT or PET scan around one to three months later, to check how well the treatment has worked. You may also have a blood test to check for tumour markers. These are substances in the blood produced by the cancer and can also be used to help check how well the treatment has worked.

If you are still having chemotherapy, speak to your chemotherapy team about what check-ups you will have.



You can speak to our specialist nurses on our free Support Line about IRE and what it involves.

# What are the side effects of IRE?

We need more research into the side effects of IRE for pancreatic cancer. Early studies have found the following side effects. Most of these only last a few days.

- You may have some pain. You can manage this with painkillers and it usually improves in one to three days.
- Some people get pancreatitis (inflammation of the pancreas). This can usually be managed with painkillers. You may need to spend a few days in hospital until the pain improves and you are able to eat. If the pancreatitis is more severe, you may need to stay in hospital for a few weeks or months, but this is not common.
- Some people have problems with feeling and being sick, and heartburn. These don't normally last very long.
- Bleeding or bruising of the pancreas can happen when the needles are inserted. If the bleeding doesn't stop by itself it may need further treatment, such as a blood transfusion or a procedure called embolisation to block the bleeding vessels.
- A small number of people may get a blood clot in a vein, but this is rare. It can be treated with blood thinning medicine.
- Very rarely, a small number of people may have a leak of fluid from their bile duct or their duodenum (first part of the small intestine). This may happen if the needles damage these areas. It may need an operation to repair the leak.

There may be a very small risk of dying after having IRE. This is rare. It may be caused by damage during the treatment.

Speak to your doctor about the risks and side effects of IRE.

If you are having chemotherapy, chemoradiotherapy or surgery, you may also get side effects from these treatments.



Read more about blood clots on our website at:  
[pancreaticcancer.org.uk/bloodclots](https://pancreaticcancer.org.uk/bloodclots)





### Questions to ask your doctor or nurse

Is IRE an option for me?

If it is an option, how can I access it?

What does IRE involve?

Will IRE help me to live longer?

Will IRE make surgery more likely?

Will IRE help any of my symptoms?

What treatment will I need beforehand?

What will happen during the treatment?

Will I need to stay in hospital after the treatment?

What side effects am I likely to have?

How long will the side effects last and how can they be managed?

Will I need further treatment after IRE?

# Further information and support

## Pancreatic Cancer UK support

We are here for everyone affected by pancreatic cancer.

### Our specialist nurses are here to talk now

If your world has been turned upside down by a pancreatic cancer diagnosis, we are here to talk now. We can answer your questions, recommend practical steps and provide the emotional support you and those close to you need, when you need it most.

Call free on **0808 801 0707** or email **[nurse@pancreaticcancer.org.uk](mailto:nurse@pancreaticcancer.org.uk)**

### Expert information

Our free information covers everything about pancreatic cancer to help you understand your diagnosis, ask questions, make decisions and live as well as you can.

Go to: **[pancreaticcancer.org.uk/information](http://pancreaticcancer.org.uk/information)**

Download or order our free publications at:  
**[pancreaticcancer.org.uk/publications](http://pancreaticcancer.org.uk/publications)** or call **0808 801 0707**

### Our online forum

The forum is a supportive online space where everyone affected by pancreatic cancer can be there for each other at any time.

Go to: **[forum.pancreaticcancer.org.uk](http://forum.pancreaticcancer.org.uk)**

### Our online support sessions

Our online support sessions are hosted by our specialist pancreatic cancer nurses and will give you the chance to connect with others who have also been diagnosed.

Go to: **[pancreaticcancer.org.uk/supportsessions](http://pancreaticcancer.org.uk/supportsessions)**

### Real life stories

Read other people's experiences of pancreatic cancer to find out how they coped with their diagnosis and treatment, and their tips on looking after themselves.

Go to: **[pancreaticcancer.org.uk/stories](http://pancreaticcancer.org.uk/stories)**

## Useful organisations

### **Cancer Research UK**

**[cancerresearchuk.org](http://cancerresearchuk.org)**

**Helpline: 0808 800 4040** (Mon-Fri 9am-5pm)

Information for anyone affected by cancer.

### **Healthtalk**

**[healthtalk.org](http://healthtalk.org)**

Personal experiences presented in written, audio and video formats, including people talking about pancreatic cancer.

### **Macmillan Cancer Support**

**[macmillan.org.uk](http://macmillan.org.uk)**

**Support Line: 0808 808 00 00** (7 days a week, 8am-8pm)

Provides practical, medical and financial support for anyone affected by cancer.

### **Maggie's**

**[maggies.org](http://maggies.org)**

**Tel: 0300 123 1801**

Centres around the UK and online offer free, comprehensive support for anyone affected by cancer.

### **National Institute for Health and Care Excellence (NICE)**

NICE provide guidance, advice and information for health professionals. They have produced guidelines for the diagnosis and care of people with pancreatic cancer:

**[www.nice.org.uk/guidance/ng85](http://www.nice.org.uk/guidance/ng85)**. They also have guidelines for IRE for pancreatic cancer: **[www.nice.org.uk/guidance/IPG579](http://www.nice.org.uk/guidance/IPG579)**

This fact sheet has been produced by the Support and Information Team at Pancreatic Cancer UK.

We make every effort to make sure that our services provide up-to-date, accurate information about pancreatic cancer. We hope this will add to the medical advice you have had, and help you make decisions about your treatment and care. This information should not replace advice from the medical team – please speak to your doctor, nurse or other members of your medical team about any questions.

Email us at **publications@pancreaticcancer.org.uk** for references to the sources of information used to write this fact sheet.

### **Give us your feedback**

We hope you have found this information helpful. We are always keen to improve our information, so let us know if you have any comments or suggestions.

Email us at **publications@pancreaticcancer.org.uk** or write to our Information Manager at the address below.

### **Pancreatic Cancer UK**

Westminster Tower  
3 Albert Embankment  
London SE1 7SP

020 3535 7090  
enquiries@pancreaticcancer.org.uk  
pancreaticcancer.org.uk

© Pancreatic Cancer UK June 2023  
Review date June 2025

Registered charity number 1112708 (England and Wales), and SC046392 (Scotland)