NHS
University Hospitals of Liverpool Group

Patient information

Selective Internal Radiation Therapy (SIRT)

Interventional Radiology Department

This document is designed to provide you with detailed information about SIRT, a specialised treatment option for liver tumours. Please take the time to read through this leaflet carefully to gain a better understanding of what SIRT entails, its benefits, risks, and what to expect during and after the procedure. It is not meant to replace informed discussion between you and your doctor but can act as a starting point for such discussions. If you have any questions about the procedure, please ask the doctor who has referred you, or the doctor performing the procedure.

What is Selective Internal Radiation Therapy (SIRT)?

Selective Internal Radiation Therapy (SIRT), also known as radioembolisation (TARE), is a minimally invasive treatment for liver tumours. It involves delivering tiny radioactive beads directly to the tumour in the liver. These beads emit radiation to destroy cancer cells while sparing healthy liver tissue.

Selective Internal Radiation Therapy may be recommended if you have:

- Liver cancer that cannot be surgically removed.
- Tumours that have not responded to other treatments.
- Limited liver function or other health concerns that make surgery risky.

What are the benefits of SIRT procedure?

Selective Internal Radiation Therapy offers several benefits for patients with liver cancer:

Minimally Invasive: SIRT is a minimally invasive procedure that does not require surgery. It is performed using only a small incision, which reduces the risk of complications and shortens recovery time.

Preserves Healthy Liver Tissue: SIRT targets the tumour directly, sparing healthy liver tissue from unnecessary damage.

Effective in Treating Liver Cancer: SIRT has been shown to be effective in treating both primary and metastatic liver cancer, including tumours that cannot be surgically removed or have not responded to other treatments.

Improved Quality of Life: SIRT can help alleviate symptoms such as pain and discomfort associated with liver cancer, leading to an improved quality of life for patients.

What will happen if I decide not to have treatment?

Your healthcare provider will evaluate your specific situation and discuss whether SIRT is a suitable treatment option for you.

There are some other treatments that might be possible (please see alternative treatment section). If you choose not to proceed you should discuss this carefully with the doctor that sent you for this procedure.

Who will be doing the SIRT?

A specially trained team of doctors, nurses, and radiographers in the X-ray department theatres. The specially trained doctor is called an interventional radiologist. They have skills in using different imaging such as X-ray/ultrasound/computerised tomography (CT) scanner to carry out the procedure.

Before the procedure

Preparation: Before the procedure, you may undergo imaging tests such as CT scans or MRI Liver to map the blood vessels in your liver and identify the tumour.

The Interventional Radiology nursing team will contact you before your procedure to discuss stopping medications and give some on the day instructions. If you are an inpatient on the ward they will contact the ward nurse.

If you have any allergies, you must let the nurse/doctor know. If you have been unwell after x-ray dye (used for CT scans) please let the team know.

On the day of the procedure the Interventional Radiologist will go through a consent form with you. You can ask any questions you may have then.

Please contact us if you are unclear on any of these instructions.

How is the procedure carried out?

The procedure has two parts. You will first attend the department to receive a planning angiogram and “test dose” (low dose radiotracer) injection followed by scan. If the planning study shows good uptake by the liver tumour and no radiotracer escaping to other organs, you will have a second procedure a few weeks later with the full dose radioactive beads.

Will I be given an anaesthetic?

Yes, the doctor will apply a local anaesthetic to freeze the area, and then the doctor will perform the procedure.

Where will the procedure take place?

In the X-ray operating theatre.

How is it done?

You will be required to change into a hospital gown. You may need to remove your jewellery, glasses, contact lenses or false teeth – check with the nurse. You will then be escorted to the theatre, where you will be looked after by the team.

Position – Lay on the table on your back.

Access – Usually Right groin/hip area.

The radiologist will use imaging to see the area to be treated. This will involve X-ray. Your skin will be cleaned and covered with a sterile drape ready to start the procedure.

There are two parts to this procedure, each performed on separate days. Preparation for both remains the same.

Planning procedure – 'First part SIRT'

An angiogram to map blood vessels for delivery of SIRT is performed in an interventional theatre.

A catheter (a thin, flexible tube) is inserted into an artery, usually in the groin area, and guided to the blood vessels supplying the liver tumour. The X-ray dye is used to show the doctor the arteries that lead to the tumour.

Once the catheter is in place, a small amount of radioactive tracer is injected to determine where the radioactive beads will go when they are injected into the liver (during the second part). It will also estimate the dose of radiation that needs to be delivered, and whether it will escape from the liver to other parts of the body, such as the stomach, intestines, or lungs.

Once the procedure has finished, the groin region will be cleaned, and a small dressing will be applied.

After this, you will be moved to the Nuclear Medicine department for a scan. If the scan finds tracer outside the liver, you may need another planning angiogram (first part) before you have SIRT (second part).

The scan helps your doctor know if it is safe for you to proceed with the treatment.

Occasionally the doctor may decide not to proceed with the treatment based on the scan findings if they find the treatment may not be beneficial.

SIRT procedure – 'Second part SIRT'

You usually have the second treatment (SIRT 2) one to two weeks after the planning procedure SIRT 1.

For this part of the procedure you will have a cannula inserted into a vein for pain relief, anti-sickness, medications, steroid to be given to help with side effects.

It involves the same process as first part, involving insertion of a catheter into the artery and guiding it to the liver for delivery of the treatment (tiny radioactive beads called microspheres).

These beads become lodged in the small blood vessels surrounding the tumour, where they emit radiation to destroy cancer cells. These beads will stay active for several months.

How long will it take?

The procedure will take two to three hours.

After the procedure

Recovery - Nursing staff will check your blood pressure, pulse, and procedure site in the recovery area. The length of time this takes depends on each patient/procedure.

Discharge for planning procedure (SIRT 1) - For the first part of the procedure (planning), you are admitted as an outpatient/day case procedure. You will normally be able to go home the same day, usually four to six hours from the end of the procedure. You will need an escort home from hospital and someone to stay with you overnight.

Discharge for SIRT procedure (SIRT 2) - For the second part of the procedure (SIRT), you will be admitted to a ward after the procedure, and you will be returned to the ward for further observation by the ward staff. You will be moved to the Nuclear Medicine department for a scan to check for delivery of radioactive beads at the intended site.

You will be reviewed on the ward the next day. Depending on the decision you may be discharged home. You will be provided with an instruction sheet to comply with radiation protection measures before you go home.

Your wound the procedure is performed through a two to three mm wound in your groin.

Back to work/driving/normal activities do not drive for 24 hours post procedure. avoid strenuous activity for a period after the procedure to allow your body to heal. You may need to avoid young children for a period after the procedure due to the radioactive tracer/beads. Please discuss with the doctor before the procedure.

What are the risks of 'SIRT'?

Fatigue: You may experience fatigue or weakness following the procedure, which typically improves within a few days to weeks.

Nausea and Vomiting: Some patients may experience nausea or vomiting, which can usually be managed with medications.

Abdominal Pain: Mild to moderate abdominal pain or discomfort is common after SIRT and can be managed with pain medications.

Temporary Decrease in Blood Cell Counts: SIRT may temporarily reduce your blood cell counts, which can increase the risk of infection or bleeding. Your healthcare team will monitor your blood counts closely and provide appropriate management if needed.

Liver Dysfunction: In rare cases, SIRT may cause inflammation or damage to healthy liver tissue, leading to liver dysfunction. Your healthcare team will closely monitor your liver function and intervene if necessary. This is also known as Radiation Induced Liver Disease (RILD) which occurs in five to ten percent of patients.

Other:

- Local Anaesthetic:

A local anaesthetic may be used. Local anaesthesia is drug-induced numbness that will be provided by the radiologist. Unfortunately, local anaesthesia can cause side effects and complications which will be discussed by the doctor doing the procedure.

- Allergic reaction.
- Radiation risk (X-ray or CT guidance)

There is always a slight risk of damage to cells or tissues from being exposed to any radiation, including the low levels of X-ray which may be used for this test. The risk of damage from the X-rays is usually very low compared with the potential benefits.

Please be aware that even a small extra amount or radiation may be harmful to an unborn child. If you think that there is a chance you may be pregnant, please contact the IR department.

The 'SIRT' (second part of procedure) involves injection of radioactive beads into the liver. Almost all the radiation from radioactive beads injection is absorbed by the area of the body closest to it. But your body fluids may be slightly radioactive for a time. It is safe for you to be around most other people. But you may have to avoid close contact with children or anyone that is pregnant for a while.

Your team will explain this and any other safety measures you need to know about or follow at home.

Your team will also give you information to carry with details of your treatment.

If you would like more information about this, we have leaflets available, or feel free to discuss this with our staff who will be happy to answer any questions you may have.

Are there any alternative treatments available?

Selective Internal Radiation Therapy (SIRT) is an innovative treatment option for liver cancer that offers the potential to improve outcomes and quality of life. If you have further questions or concerns about SIRT, don't hesitate to discuss them with your healthcare team. We are here to support you throughout your treatment journey.

There might be other treatment options. If you choose not to proceed you should discuss this carefully with your doctor.

These procedures may have more risks. It is up to you whether you choose to proceed. You should speak to your doctor about this.

Further Appointments

Follow-up: If any further appointments that are needed you will be contacted by the team that sent you for the procedure.

Unexpected problems or concerns: Ring the Interventional Radiology department if related to this procedure (RLUH – 0151 706 2748, AUH – 0151 529 2925).

If you think you need **urgent** medical assistance, please contact NHS111 or attend your local Emergency Department (A&E).

Feedback

Your feedback is important to us and helps us influence care in the future.

Following your discharge from hospital or attendance at your outpatient appointment you will receive a text asking if you would recommend our service to others. Please take the time to text back, you will not be charged for the text and can opt out at any point. Your co-operation is greatly appreciated.

Further information

Interventional Radiology department:

The Royal Liverpool Hospital – 0151 706 2748
Aintree University Hospital – 0151 529 2925

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All Trust approved information is available on request in alternative formats, including other languages, easy read, large print, audio, Braille, moon and electronically.

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