



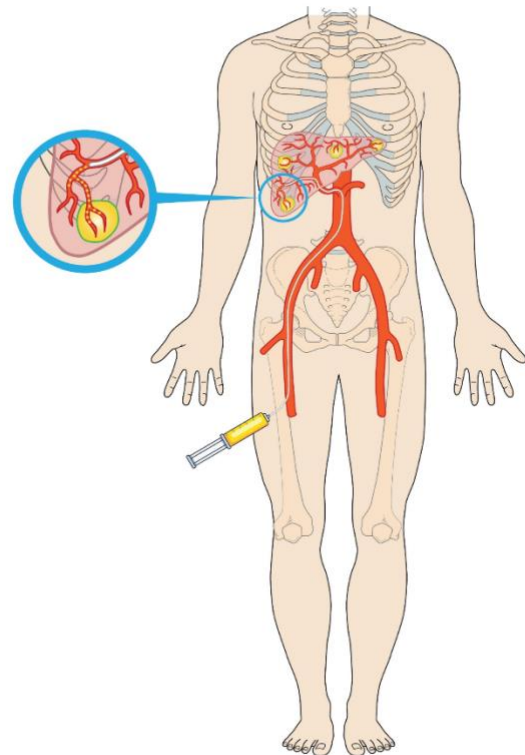
Selective Internal Radiation Therapy (SIRT)

Introduction

This leaflet has been developed for patients being offered a procedure called selective internal radiation therapy (SIRT), also known as radioembolisation. It is intended to provide you with information about the procedure, the side effects, the benefits and risks and to answer some of the questions you may have about the treatment. If you have any further questions, please speak with your doctor/s.

What is selective internal radiation therapy?

- Selective internal radiation therapy or SIRT is a treatment that delivers targeted internal radiation directly to the tumour.
- It is a treatment for liver tumours that cannot be removed by surgery. These may be cancers that start in the liver (primary liver cancer), or they may be tumours that have spread to the liver from another part of the body (secondary liver cancer or metastases).
- SIRT is a two-stage procedure, usually 1 - 3 weeks apart. The first stage is the Work-up and involves an angiogram and embolisation to ensure that any blood vessels that are not directly feeding the tumour are blocked off to protect other organs from damage by the therapy. Following this a small dose of radioactive tracer material is injected into the liver arteries to ensure that the treatment can be performed safely. This will help to maximise the effects of the treatment and minimise any unwanted side effects.
- Assuming that the results of this initial test are acceptable, the dose of microspheres will be determined, and the second stage can be planned. The second stage is the treatment, where millions of tiny beads (called microspheres) containing a radioactive element [Yttrium-90 (Y90) Theraspheres or SIRspheres] are injected into a blood vessel that takes



blood to the liver. The beads get stuck in the small blood vessels in and around the tumours (cancer cells) in the liver, and release radiation which destroys the cancer cells. As the radiation only travels a few millimetres from where the beads are trapped, it causes little damage to the surrounding healthy cells. At both stages the therapy is delivered via a catheter (plastic tube) inserted in your groin or wrist.

- The microspheres tend to lodge in the small vessels feeding the tumour and deliver their dose of radiation for a number of weeks.

Who is SIRT suitable for?

Patients with a liver tumour that is relatively large or in a difficult location for surgery, may benefit from selective internal radiation therapy. Additionally, SIRT may be used to reduce size of tumour to facilitate future surgery or transplant.

Not all people are suitable for selective internal radiation therapy. This is because there is a risk of making your liver function worse.

We only offer you selective internal radiation therapy after discussions at the multidisciplinary team (MDT) meeting, attended by oncologist, radiologist, surgeons, physicists, where other treatment options (chemoembolisation, radiotherapy and surgery) are discussed and SIRT is considered the best treatment option for you.

Who will be doing the procedure?

A specially trained doctor called an interventional radiologist will carry out the procedure. Interventional radiologists have expertise in using X-ray and scanning equipment, and in interpreting the images produced. They need to look at these images while carrying out the procedure. The treatment will take place in an x-ray theatre, in the radiology department.

Where will the treatment take place?

The treatment will take place in the radiology department, in a specially adapted x-ray theatre also called angio suite. It will also involve a trip to the nuclear medicine department, at each stage, for scans.

Agreeing to treatment

We will ask you to sign a consent form agreeing to accept the treatment that you are being offered. The basis of the agreement is that you have had verbal and written description of the proposed treatment and that you have been given an opportunity to discuss any concerns. You are entitled to request a second opinion from another doctor who specialises in treating this cancer.

Your consent may be withdrawn at any time before or during this treatment. Should you decide to withdraw your consent then a member of your treating team will discuss the possible consequences with you.

How should I prepare for the treatment?

Pre-assessment appointment

We will send you a letter in the post for a pre-assessment appointment. This will usually be a telephone appointment, but we may ask you to come into hospital if we need to perform a blood test. During this appointment, we will ask you questions about your health, medical history and home circumstances to ensure you are well enough for the treatment. We will also explain how to prepare for the treatment.

Medication

We will inform you during your pre-assessment appointment about which medications you will need to temporarily stop taking and which you can continue taking.

Food and drink

You must not eat anything (nil by mouth) for six hours before each stage of SIRT. You may continue to sip clear water up to the time of procedures.

Staying overnight

The first stage of SIRT is usually done as a day case, so you will be able to go home the same day. Please arrange for a responsible adult to accompany you home after your appointment and stay with you overnight. After the second stage of SIRT, you will need to stay in hospital overnight. This is so we can make sure you're feeling well before you go home. Please bring an overnight bag with you, including all the medications you are currently taking. Following the second stage of SIRT, there may be specific requirements for isolation at home that will be conveyed to you by the nuclear medicine team. This can range from 1 to 2 weeks. This is to prevent close and prolonged contact with other individuals, especially children and young people, when there is risk of radiation exposure.

Allergies

Please let us know during your pre-assessment appointment if you have any allergies, or if you have previously reacted to intravenous contrast medium (the dye used for x-rays and CT scans).

What will happen during each stage of the treatment?

Stage one: Work-up angiogram

When you arrive for your appointment, we will complete your admission documents and then check your blood pressure, blood oxygen levels, temperature, heart rate and respiratory rate. We will then ask you to change into a hospital gown. We may insert a cannula (a thin, plastic tube) into a vein in your arm, which will allow us to give you painkillers and /or a sedative (medication that makes you feel sleepy and relaxes you), if needed. We will then take you into one of our special angiography rooms and ask you to lie flat on your back on an x-ray table. We will place monitoring devices. We may also give you some oxygen through small tubes in your nostrils. We will clean the skin around your groin or left wrist, with antiseptic and cover the rest of your body with a theatre drape.

We will then inject some local anaesthetic into your groin or left wrist. This may sting briefly before going numb. The radiologist will gain access into the artery and place a plastic tube. Through this another plastic tube called catheter is placed. We will pass the catheter along this artery to the

main blood vessel that carries blood to your liver (hepatic artery). A small amount of contrast dye is injected, to make sure that the catheter is moved into the right position in the chosen artery (this is called angiogram). If required, we will place tiny coils through the catheter to block the selected vessel/s to help with the procedure.

Through the catheter, we will then inject a test dose of radiation (Technetium-99m) into your liver. This is a radioactive 'dye' that can be detected by a special camera to check that the procedure can be safely performed without damaging other organs. Finally, we will remove the catheter from the artery and manually compress or insert a closure device to stop any bleeding. You will be taken directly to the scanner in the nuclear medicine department after the injection to be scanned straight away and determine the distribution of the test dose of radiation (which shows us where the microspheres will go during treatment). This can take up to an hour and you will remain on your back during the scan. It must be considered that due to many factors, not all workups result in treatment.

Stage two: Treatment

This second stage is very similar to stage one. The only difference is that when the catheter is in the correct position, we will slowly inject microspheres (tiny radioactive beads) into your liver. The procedure will probably take between 2 - 3 hours. As a guide, expect to be in the radiology department for up to 4 hours. Prior to the second stage, you may be given some medication called a proton pump inhibitor (PPI) to take for 2 weeks. PPIs reduce acid in your stomach. This is because the treatment can irritate your stomach. You will have been given some antibiotics on the ward to prevent infection and an anti-sickness medicine to prevent you feeling sick.

Will it hurt?

Stage 1 of the procedure is usually painless. Some patients may feel uncomfortable due to the length of time they are lying on the x-ray table. If so, let the nurse know so you can be given some painkillers or sedatives to help. In stage 2 of the procedure some people may experience pain or discomfort (usually abdominal tension, pain) when the SIR-Spheres are delivered. However, you will be given painkillers and sedation during the procedure. There will be a nurse looking after you so, if you find the procedure uncomfortable, you will be given more painkillers.

Are there any risks or complications?

For both workups and treatment:

Vascular: bruising or bleeding at puncture site or damage to a vessel caused by the catheter, this may settle or need radiological or surgical treatment.

Infection, pain, failure of procedure, contrast allergy, renal function impairment- these risks are infrequent and can be managed conservatively when they occur.

Only during treatment:

Post-embolisation syndrome: flu-like symptoms (pain, fever, sickness, diarrhoea, tiredness, loss of appetite). The staff will give you painkillers to improve the symptoms or over the counter pain relief medication should help.

Radiation: 20% risk of radiation induced liver disease RILD where your liver may stop working properly. Most cases are mild and won't be noticed. These symptoms develop in 2-8 weeks (pain in the upper side of your abdomen, yellowing of your eyes, fatigue). If any of these occur, please

contact your oncology specialist nurse, interventional radiologist or GP for advice. Radiation damage to other abdominal organ or lungs or less likely because of the extensive planning that we do before the treatment, however, if there is excessive uptake to other organs the consequences could be serious.

How soon can I eat and drink?

Most patients can drink fluids and have something to eat soon after the procedure and scan.

Are there any special precautions after the procedure?

The risk of radiation in your body travelling to people around you is very low. But because the treatment is radioactive, there are some simple precautions that need to be taken following the SIRT procedure. The precautions below are to be applied only for the second stage of the SIRT procedure "the treatment".

For the first 24 hours

- Wash your hands thoroughly after going to the toilet. Flush the toilet twice after use.

When travelling home after the treatment procedure

- Sit, as the only backseat passenger, in the back seat diagonal to the driver. Do not travel with children or pregnant women. You can travel by public transport accompanied if the journey takes less than 3 hours.

At home

- To reduce any radiation dose to your partner we suggest that you sleep in a separate bed for between 7 and 14 days after returning home. The exact length of the time that you will need a separate bed is determined on the day of treatment and Nuclear Medicine staff will inform you of this before you go home.
- We also recommend avoiding close contact with people who are pregnant and children for 7 days after returning home.
- If for any reason you cannot comply with the above (e.g. you only have one bed, you have no alternative care for your children) please speak to the doctor in advance of your treatment. This will allow your situation to be reviewed on an individual basis. It doesn't mean that you won't be treated, so please do let us know.

These precautions will only apply after the second part of your SIRT procedure and someone from the nuclear medicine department will go through them with you before you return home. The precautions will be given to you on a card by them.

You must NOT have selective internal radiation therapy if you are pregnant and you must NOT become pregnant within 4 months of selective internal radiation therapy treatment.

If you are breastfeeding, you must stop for at least 2 weeks after treatment. Nuclear medicine will test your milk to determine when is safe to resume.

Some of the microsphere may be in your semen after treatment. Do not conceive or donate sperm for 4 months after treatment.

There can be sensitive radiation detectors at airports, seaports, large scale events, etc. Because of this we will give you a letter to take to such places for the next four months. This letter can be shown to staff, if they detect radiation from you because of your treatment, so that they know why you activated the radiation detectors.

Please ask the Nuclear Medicine staff for more advice if you have any concerns.

If you need information in a different format, such as easy read, large print, BSL, braille, **email, SMS text or other communication support, please tell your ward or clinic nurse.**

Any other questions?

We hope we have covered a lot of the usual questions people have, but if there is anything else you would like to know please do not hesitate to ask us. You can contact us either in person or on the telephone on the following numbers:

Consultant Interventional Radiologists

Dr Mehrzad and Dr Karkhanis via their medical secretary. Telephone: **0121 371 4283**, Monday–Friday, 09:00–17:00

HBP Clinical Nurse Specialists via their secretary:

Telephone: **0121 371 4652**, Monday–Friday, 09:00–17:00

Accessibility

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