

### What is radioactive Yttrium SIR-Sphere Therapy?

Yttrium-90 (<sup>90</sup>Y) SIR-Sphere Therapy is targeted treatment for liver tumours, through the direct delivery of millions of tiny radioactive microspheres.

The SIR-Spheres contain a radioactive element (<sup>90</sup>Y) which emits beta radiation up to 2.5mm within the soft tissue. They are administered through the arterial blood stream to the liver tumour, where they target and destroy the tumour cells. This treatment is known as Selective Internal Radiation Therapy (SIRT).



### What do I need to do on the day of each procedure?

On the day of your appointment, please ensure you bring:

- Your Request (if you have it)
- All previous relevant scans or X-rays
- Medicare, healthcare, and private health insurance cards
- List of all medications
- *For part 2 of the procedure* - an overnight bag for the hospital admission

### Is there any special preparation or information I need to be aware of?

When booking your appointment, our staff will advise you of the date, time and preparation for the procedure. It is essential that you inform our staff if you are pregnant or breastfeeding.

Your treatment team will require a detailed medical history including cancer history and any other medical conditions you may have. They will also conduct several initial tests to ensure you are able to receive SIRT safely, these tests will include a blood test to evaluate your kidney function and blood clotting factors.

Please have a list of your medications including pharmaceutical, herbal and supplements ready when making the appointment. **It is particularly important that you do not stop any medications or change dosage without consulting with our medical imaging clinical staff and/or your referring doctor.** When making your appointment, if required, you will be given specific instructions about when to ceasing and re-starting any medications if applicable.

Both procedures are normally undertaken with you conscious (awake), but you may be given some sedation. This can make you drowsy but ensures you feel comfortable.

SIRT (part 2) usually requires an overnight stay in hospital, your treating doctor will advise what arrangements need to be made for hospital admission. Please check with the hospital what to bring with you for admission.

### How long will the procedure take?



SIRT involves two procedures:

1. **Work-up** for SIRT may take approximately 90 minutes and is usually done as an out-patient. It involves both an angiogram procedure, followed by imaging performed in the Nuclear Medicine centre, you will then be observed for up to 3 hours.
2. **SIRT** involves the implantation of SIR-Spheres®. This may take approximately 60 minutes, followed by imaging performed in the Nuclear Medicine centre, you will then be observed for up to 3 hours before being transferred to a ward for your overnight stay in hospital.

### What happens during the procedure?

#### 1. Work-up

This phase is the preparation for the treatment and is commonly known as the work-up, it is commonly performed as an out-patient procedure. It involves an angiogram, as well as nuclear medicine imaging.

The purpose of the angiogram is to assess your circulatory system and prepare your liver for the SIRT treatment.

For the angiogram, a small incision is made into the femoral artery or radial artery (the artery used will be determined by the interventional radiologist), through which a catheter (thin tube) is guided through the main blood vessels into the liver. The procedure required you to be awake, with a local anaesthetic administered to minimise the discomfort around the incision site.

The blood vessels are checked to ensure the SIR-Spheres can safely be administered with the best chance of success, this will involve a contrast medium (this may induce a warm sensation) which travels via the catheter into the liver and highlights the blood vessels. During this time the interventional radiologist may be required to block (embolise) blood vessels to ensure the SIR-Spheres are precisely delivered.

Once the interventional radiologist has completed any required embolisations and the catheter is in position they will administer a small amount of a radiotracer ( $^{99m}\text{Tc}$ -Macroaggregated Albumin) to check the radiation distribution in the liver, tumour(s), and surrounding tissues. This radiotracer imitates the distribution of SIR-Spheres for treatment. Images will be acquired throughout the angiogram.

Once the interventional radiologist has all the images required the catheter will be removed, and firm pressure will be applied to the incision site for approximately 10 minutes to prevent bleeding.

Following this, you will be transferred to the Nuclear Medicine centre, where images of the radiotracer are acquired to visualise the distribution of the radiotracer. This distribution will be analysed to determine the amount and location of the radiotracer and aid in assessing your eligibility for SIRT as well as the dose to be administered to you.

Upon completion of your imaging, you will be observed for up to 3 hours, before being allowed to return home. During this time the treating doctor will review both the angiogram and nuclear medicine imaging to determine your suitability to proceed with SIRT.

If your doctor determines that you are suitable to proceed with SIRT, you will be given an appointment to return to the hospital within 2 weeks for the SIRT treatment and will be required to stay overnight in hospital.

## 2. SIRT

This phase is the administration of the SIR-Spheres and follows a very similar process to the work-up phase.

A small incision is made into the femoral artery or radial artery (the artery used will be determined by the interventional radiologist), through which a catheter (thin tube) is guided through the main blood vessels into the liver at the site of the tumour. The procedure required you to be awake, with a local anaesthetic administered to minimise the discomfort around the incision site and sedation medication may be administered to help you relax.

Once the catheter is in position, the contrast medium (this may induce a warm sensation) will be administered to ensure the location of the catheter in relation to the tumour and surrounding blood vessels.

The SIR-Spheres are then administered, via one or several injections through the catheter. Once the artery has been completely blocked off, the catheter will then be removed and firm pressure will be applied to the incision site for approximately 10 minutes to prevent bleeding.

You will then be transferred to the Nuclear Medicine centre, where images of the SIR-Spheres will be acquired to ensure the therapy has been dispersed into the liver.

Following the Nuclear Medicine imaging, you will be observed for up to 3 hours, before being transferred to the ward.

## What are the benefits?

The benefits of SIRT have been demonstrated in the following areas:

- When used in combination with chemotherapy, SIRT may shrink liver tumours more than chemotherapy alone
- Improving quality of life
- Increasing life expectancy
- In a small number of patients, SIRT has caused the liver tumour to shrink to a size which permits removal by surgery
- In patients with liver tumours not responding to chemotherapy, SIRT has been used to shrink the liver tumour and extend a patient's survival

For most patients, treatment will result in increased life expectancy, but it is not a cure.

## Are there any after effects or risks from the treatment?

In referring you for these SIRT procedures, your doctor is of the opinion that the benefits to you outweigh the risks and potential side effects.

Your treatment team led by a highly trained interventional radiologist, have received training to minimise these risks and will track your progress regularly.

You should not have any serious aftereffects when SIR-Spheres® are correctly administered. You may experience some of the following side-effects or you may not experience any side effects at all. Almost all treatments can produce side effects, most which can be minor, but a small number can be serious. Each patient is different in how they react to treatment.

Common side effects:

- Abdominal pain and / or nausea, which normally subsides after a short period of time or with routine medication.
- Mild fever, which can last up to one week.
- Loss of energy / fatigue for several weeks.

Common risks and complications:

- Minor pain, bruising and/or infection from the IV cannula or at the incision site.
- Pain or discomfort at the puncture site.
- Bleeding or bruising may occur.
- Your radiation risk from treatment with <sup>90</sup>Y-SIR-Spheres is low.
  - <sup>90</sup>Y emits beta radiation to approximately 2.5mm within the liver.

Rare complication:

- A small number of microspheres may inadvertently reach organs such as the gallbladder, stomach, intestine, or pancreas. If SIR-Spheres reach these organs they may cause cholecystitis (inflammation of the gallbladder), gastritis (inflammation of the stomach), or duodenitis (inflammation of the intestine). These complications are rare, but if one occurs it normally requires additional treatment.

Prior to the therapy the treating doctor will discuss the procedure with you, including any risks specific to you.

## What happens after the procedure?

After the SIRT, small amounts of radioactivity are released from your body, and you should avoid close prolonged contact with pregnant women or young children for at least a week. This will be explained to you.

Before the scan, our specialist doctor will discuss the procedure with you, including any risks specific to you. You will be given the opportunity to ask questions. It may be necessary to have a formal consultation to make sure that the procedure is the most appropriate for you.

You will be provided with instructions on how to look after yourself, and those around you, following the Y-90 SIRT. This instruction will include information on re-starting any medication and arranging a follow up appointment with the referring doctor.

After the SIRT, small amounts of radioactivity are released from your body and therefore it is important you adhere to the following:

Days 1 – 2	<ul style="list-style-type: none"> <li>• Thoroughly wash your hands after going to the toilet.</li> <li>• All bodily fluids such as blood, urine and stools are disposed of in the toilet.</li> </ul>
Days 1 – 4	<ul style="list-style-type: none"> <li>• Sleep alone</li> </ul>
Days 2 – 3	<ul style="list-style-type: none"> <li>• Most patients can resume their normal daily activities</li> </ul>
Days 1 – 7	<ul style="list-style-type: none"> <li>• Avoid close, prolonged contact with pregnant women and young children</li> </ul>
Days 1 – 14	<ul style="list-style-type: none"> <li>• No breastfeeding</li> </ul>
Days 1 – 60	<ul style="list-style-type: none"> <li>• Pregnancy is to be avoided</li> </ul>

After 2 weeks, only 3% of the initial radiation remains, and after 1 month it has all disappeared.

Please feel free to discuss these precautions with your treating specialist.

### When do I get the results?

The aim of SIRT is to reduce the size of tumour(s) in the liver, to prolong the life of the patient, while at the same time maintaining or improving quality of life.

Following the SIRT, a report outlining the procedure(s) will be sent to your referring doctor and regular GP.

Please ensure you make a follow-up appointment with your referring doctor.

### I still have questions; who can I ask?

Medical information can be complex, and you may receive information that you do not fully understand. It is important for you to consider the risks and outcomes of the procedure as well as your personal needs before deciding to undergo the procedure.

If you have read this online information and are still unsure if this is the correct procedure for you; before making a booking, you should discuss your questions or concerns with your referring doctor in the first instance. Your regular GP and/or your family may also be a useful resource. Your referring doctor can answer questions about the risks and benefits of not having the procedure and other options for treatment.

If you have questions before your appointment about what is involved on the day, our staff would be happy to assist. Please contact the Lumus Imaging centre where you have made your appointment.