

## What is radioactive Yttrium SIR-Sphere Therapy?

Radioactive Yttrium (Y-90) SIR-Sphere Therapy (SIRT) is a treatment for liver cancers or tumours that combines the delivery of radiotherapy and an embolisation procedure.

Embolisation is a procedure that blocks off the blood flow to a targeted area in the body. The blood supply to the tumour is blocked by a material called an 'embolic agent'. The embolic agent has radioactive material inside it. In SIRT, millions of tiny radioactive microspheres or beads called SIR-Spheres® are delivered directly to the liver tumours. This results in the radioactive material being trapped inside the tumour without exposing the entire body to its effects. It also blocks off the blood supply to the tumour.



## How long will the procedure take?



SIRT involves two procedures.

1. The work-up procedure for SIRT may take about 90 minutes and is normally done on an outpatient basis. You will be observed for up to three hours after the work-up procedure and may then return home. If your doctor determines that you are suitable to proceed with SIRT, you will be given an appointment to return to the hospital within 6 weeks for the SIR-Spheres® implant angiogram. Our staff will advise you of the time to return for the second part and provide instructions for eating, drinking, and medications.
2. The second part of the procedure, the SIR-Spheres® implant may take about 60 minutes. Your groin puncture wound will be compressed for approximately 10 minutes. The puncture wound is compressed to stop bleeding at the wound site. You will have some imaging taken in the Nuclear Medicine centre, be observed for up to 3 hours and then taken to a general ward for an overnight stay at the hospital.

The time taken for the two SIRT procedures is significantly less than may be encountered with regular weekly or bi-weekly chemotherapy treatments.

## Is there any special preparation required?

When booking your appointment, it is essential that you inform our staff if you are pregnant or breastfeeding. Please have a list of your prescribed medications ready when making the appointment. This also includes those medications that you buy over the counter at a pharmacy, or herbal remedies and supplements.

You may need to stop taking certain medications for a few days. **It is very important that you do not stop any medications or change the dose without consulting with our medical imaging clinical staff and your own doctor.** They will give you specific instructions about when to stop and restart the medication. You should continue with pain medication and other medications as usual.

Your treatment team will want to know about your previous cancer history and any other medical conditions you may have. They will then conduct a number of initial tests to ensure that it is possible for you to receive SIRT safely. You will normally have two procedures where you will be conscious (awake) but you may have some sedation to make you drowsy so that you feel comfortable.

The treatment requires an overnight stay in hospital. Your treating doctor will advise what arrangements need to be made for hospital admission. You may need to check with the hospital what you need to bring with you for admission.

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

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

- Your referral form (if you have it)
- All previous relevant scans or x-rays
- Medicare and healthcare cards
- List of all medications
- An overnight bag on the second day for the hospital admission

## What happens during the procedure?

SIRT normally comprises two procedures:

### 1. Preparation or “work-up”

The first procedure for SIRT is the preparation phase for the treatment commonly known as the work-up that includes a radiology procedure known as an angiogram. The purpose of the angiogram or mapping is to prepare your liver for SIRT. You will have blood tests to evaluate your kidney function and blood clotting. During the mapping procedure, your interventional radiologist (our specialist doctor) may block (embolise) some of the liver blood vessels communicating with other blood vessels. You will also receive a small amount of radioactive spheres (MAA) similar in size to SIR-Spheres® to check the amount of blood that flows from the liver to the lungs.

During the angiogram a small amount of dye (or contrast medium) is injected through a catheter (a thin plastic tube) inserted into an artery. The dye travels down the catheter into the liver and highlights the blood vessels. Images or pictures are taken throughout the procedure. Most patients say they feel a little warm when the dye is injected. This work-up angiogram is done in a conscious state (awake) and a local anaesthetic is given so that the discomfort from the procedure is minimal around the puncture wound in your groin.

The work-up procedure for SIRT is normally done on an outpatient basis. You will be imaged in nuclear medicine after the angiogram procedure. You will be observed after the work-up procedure and may then return home. While you are being observed, your doctor will review the X-ray images to determine your suitability for SIRT and to see if you are suitable to proceed with the SIR-Spheres® implant.

### 2. Implant of SIR-Spheres®

You will need to return to the hospital within 6 weeks of the work-up when a second angiogram is performed to implant the SIR-Spheres® (SIRT). A fine needle (IV cannula) will be put into a vein in your arm and you will be given the sedation anaesthetic.

The radiologist (our specialist doctor) will inject local anaesthetic into the skin. A needle and thin plastic tube (catheter) are inserted into the artery in your groin; sometimes your arm may be used. Once the catheter is in place the needle is removed. The catheter is guided through the main blood vessels in your body until it reaches the tumour in your liver. You should not be able to feel the catheter inside your body. X-ray pictures are taken while the iodinated contrast (once called x-ray dye) is injected into your arteries. Contrast is used during the procedure to help map your arteries for the doctor to locate and treat the tumour. Once the catheter is in place the radioactive embolic agent is injected. Several injections may be needed to complete the dose and block off the artery. Once the artery is completely blocked, the catheter will be removed. Firm pressure will be put over the area where the catheter went into your skin (puncture site), sometimes a special plug is used. This allows the artery to seal so you will not bleed. You will then be imaged in nuclear medicine after the insertion procedure to check the SIR-Spheres® are delivered to the target tumour.

## Are there any after effects from the treatment?

You should not have any serious after effects 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:

- Pain in the abdomen that may last for a few hours: This can be well controlled with pain medication.
- Nausea may be caused by the angiography contrast medium that is injected into the vessels or as a result of the SIR-Spheres® infusion into the liver: This is a short-term effect (several days) which can be well controlled with anti-nausea medication.
- Reduced appetite: Some patients may feel a loss of appetite for several days.
- Tiredness: This may be caused by the effect of the radiation on the liver tumours and may last several days.

- Fever: The destruction of the liver tumours and the by products of this destruction may cause a short term fever (up to a week). This can be well controlled with paracetamol or a similar over the counter analgesic.
- Radiation in the body: Your treating doctor will advise you on the effects of radiation and will advise that contact with other people should be minimised for at least the first week after treatment. This means that prolonged, close physical contact should be avoided, such as, sitting/sleeping next to children or pregnant women. Please feel free to discuss this with your radiologist.

### What happens after the procedure?

Our staff will provide you with clear written instructions on ways to look after yourself, and those around you, following the Y-90 SIRT, including things like re-starting any medication stopped and arranging a follow up appointment with your referring doctor.

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.

If you are breastfeeding, you will need to stop breastfeeding as instructed by the nuclear medicine technologist.

### What are the benefits?

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

- Combining SIRT to standard chemotherapies provides greater survival benefit than just using chemotherapy alone.
- Survival benefit has been demonstrated in patients whose cancer has not responded to all forms of chemotherapy and then received SIRT as a sole treatment.
- Reducing the sizes of tumours.
- Reducing tumour sizes to the point that liver surgeons can remove the tumour from the liver.
- Improving quality of life for the patient.
- Allowing some patients to have a liver transplant.

For most patients, treatment will result in increased survival time, but not a permanent cure.

### Are there any risks?

In referring you for these SIRT procedures, your doctor is of the opinion that the benefits for you are greater than the risks.

There are possible risks with SIRT. Your treating interventional radiologist is a highly trained specialist doctor who is experienced with minimising the risks for this procedure.

The common risks and complications of the procedure include:

- Minor pain, bruising and/or infection from the IV cannula. This may require treatment with antibiotics.
- Pain or discomfort at the puncture site. This may require medication.
- Bleeding or bruising may occur. This is usually stopped by applying pressure and/or ice to the puncture site. This is more common if you take Aspirin, Warfarin, Clopidogrel (Plavix and Iscover) or Dipyridamole (Persantin and Asasantin).
- Post Embolisation Syndrome which includes pain, nausea, vomiting and fever. Antibiotics and pain relief medications will be required to treat this.

Y-90 emits Beta radiation which is a type of ionising radiation to produce the images. The radiation dose associated with SIRT is low but it takes a few days for the radiation to pass out of your body.

Prior to the scan our specialist doctor will discuss the procedure with you in detail including any risks specific to you. You will be provided with the opportunity to ask questions. It may be necessary to do a formal consultation to make sure that the procedure is the most appropriate for you.

### **When do I get the results?**

The aim of SIRT is to reduce the size of tumours in the liver so as to be able 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 that you make a follow-up appointment with your referring doctor so they can assess the results of your SIRT. They may do this by you having a CT scan of your liver, a PET scan or blood tests to look at 'tumour markers.'

### **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 making a decision 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 imaging centre where you have made your appointment.