

## **Information for patients**



**Selective Internal Radiation Therapy (SIRT)  
with  
Yttrium-90 Micro-spheres**

**Leading Interventional Oncology Network**

## Contents

<b>Introduction</b>	<b>3</b>
<b>What to tell the doctor</b>	<b>3</b>
<b>What is Selective Internal Radiation Therapy</b>	<b>3</b>
<b>Why do I need Selective Internal Radiation Therapy?</b>	<b>4</b>
<b>Who has made the decision?</b>	<b>4</b>
<b>Who will be doing the procedures?</b>	<b>4</b>
<b>Agreeing to treatment</b>	<b>4</b>
<b>Where will the procedures take place?</b>	<b>4</b>
<b>How do I prepare for Selective Internal Radiation Therapy?</b>	<b>4</b>
<b>What actually happens at stage 1: the angiogram and embolisation?</b>	<b>4</b>
<b>What actually happens at stage 2: the treatment?</b>	<b>5</b>
<b>Will it hurt?</b>	<b>5</b>
<b>How long will it take?</b>	<b>6</b>
<b>What will happen afterwards?</b>	<b>6</b>
<b>How soon can I eat and drink?</b>	<b>6</b>
<b>Are there any special precautions?</b>	<b>6</b>
<b>Are there risks or complications?</b>	<b>6</b>
<b>What are the benefits?</b>	<b>7</b>
<b>What are the alternatives?</b>	<b>7</b>
<b>Signs to look out for</b>	<b>7</b>
<b>Contact Details</b>	<b>7</b>
<b>Further information</b>	<b>8</b>

# Selective Internal Radiation Therapy (SIRT)

## Your procedure explained

### Introduction

This leaflet tells you about the procedure known as Selective Internal Radiation Therapy also called radio-embolisation. It explains what is involved and the benefits and risks. It may make you think of things you would like to discuss with your doctor/s.

### What to tell the doctor

It is important to tell the doctor before you come for your procedure if:

- you are taking any medication to prevent clots, such as warfarin, heparin, enoxaparin, aspirin or clopidrogel . You must not take aspirin or clopidrogel for two weeks before your procedure.
- you have any allergies
- you have had a previous reaction to intravenous contrast medium (the dye used for some x-rays and CT scanning)

### What is Selective Internal Radiation Therapy?

- **Selective Internal Radiation Therapy** or SIRT is a treatment that delivers targeted internal radiation therapy directly to the tumour.
- It is a treatment that is approved for the treatment of 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).
- It is a two stage procedure, usually 1 to 3 weeks apart. The 1<sup>st</sup> stage involves an angiogram and may involve an embolisation to ensure that any blood vessels that are not directly feeding the tumour are blocked off. This will help to maximise the effects of the treatment and minimise any unwanted side-effects.
- During the 2<sup>nd</sup> stage, the treatment is delivered using tiny beads - less than the width of a human hair - containing a radioactive element (Yttrium-90 ( $Y^{90}$ ) or Micro-Spheres) to treat the liver tumours directly. At both stages the therapy is delivered via a catheter in your groin.
- The microspheres tend to lodge in the small vessels within the tumour and deliver their dose of radiation for a period of approximately two weeks.
- The microspheres with the radioactive  $Y^{90}$  are carried by the bloodstream directly to the tumours in the liver.
- It is a localised treatment and the effect of the treatment is just concentrated in the liver.

### **Why do I need Selective Internal Radiation Therapy?**

You will probably already have had several other different treatments for example chemotherapy and/or surgery. These treatments may no longer be effective on your cancer and the doctors looking after you have decided to offer this option.

### **Who has made the decision?**

Your doctors and the interventional radiologist doing the treatment will have discussed the situation and feel this is the best treatment option. They will discuss the treatment with you.

### **Who will be doing the procedures?**

A specially trained doctor called an interventional radiologist. Interventional radiologists have special expertise in using x-ray and scanning equipment, and also in interpreting the images produced. They need to look at these images while carrying out the procedure.

### **Agreeing to treatment**

The doctor or nurse will ask you to sign a consent form agreeing to the treatment. Please take time to read the information and ask your doctor or nurse about any concerns before you sign the consent form.

### **Where will the procedures take place?**

In the special procedure room of the Diagnostic Radiology Department.

### **How do I prepare for Selective Internal Radiation Therapy?**

You will probably already have had CT and PET scans. You will need to be an in-patient in hospital for SIRT. We will ask you not to eat for six hours beforehand, though you may drink clear fluids up to two hours before the procedure. We will ask you to put on a hospital gown.

### **What actually happens at stage 1: the angiogram and embolisation?**

1. You will lie on the x-ray table, generally on your back. You will already have a needle in the vein in your arm, so that you we can give you some painkillers and a sedative as needed. The sedative will make you feel sleepy. You will also have monitoring devices attached to you. You will have oxygen through small tubes in your nose.
2. The Interventional Radiologist needs to keep everything as sterile as possible and will wear theatre gown and gloves. The skin around the puncture site will be swabbed with antiseptic and the area covered with theatre towels.
3. The Interventional Radiologist will give you an injection of local anaesthetic in the skin in your groin area and deeper tissues over the artery, which will cause some stinging initially, and then go numb.

4. The Interventional Radiologist will insert a needle into the artery, once he is satisfied that this is in the correct position he will place a guide wire through the needle into the artery. Then the needle is withdrawn and a fine plastic tube called a catheter is placed over the wire into the artery.
5. The Interventional radiologist will use the x-ray equipment and small amounts of contrast medium (x-ray dye) to make sure that the catheter is moved into the right position in the chosen artery. The radiologist will need to do this in several arteries to get a good idea of your anatomy (this is called an angiogram) to be able to deliver the treatment.
6. When the Interventional Radiologist is satisfied with the angiogram, he will place tiny coils through the catheter to block the selected artery or arteries.
7. The Interventional Radiologist will then give you an injection of technetium-99m. This is a radioactive 'dye' that allows detection by gamma camera to check that there is limited blood flow directly from your liver to your lungs. You will need to be transferred to a separate department for this scan.

### **What actually happens at stage 2: the treatment?**

You will have been given some medication called a Proton Pump Inhibitor (PPIs) to take for two weeks before this stage. PPIs reduce acid in your stomach. This is because the treatment can irritate your stomach as the liver is close to 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.

Stage 2 will be the same as steps 1 to 5 of stage 1 above, then

6. It is possible that the Interventional Radiologist may have to put further coils in selected arteries, as 6 above. If you do not need any additional coils, your treatment will be delivered at this stage through a fine catheter which is guided into the liver.
7. This injection of spheres may be painful and so if needed you will be given a pain killing injection immediately prior to the SIR-sphere delivery.
8. You will need to go to the Isotopes department following the treatment for another scan – this can take up to an hour.

### **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, tell the nurse know so you can be given some painkillers or sedatives to help.

**In stage 2** of the procedure you may experience some pain or discomfort (usually a bloated feeling) when the Micro-Spheres are delivered. However, you will be given painkillers and sedation as needed. There will be a nurse looking after you so, if you find the procedure uncomfortable, you will be given more painkillers. We cannot predict who might get pain, but if you experience any, you must ask the nurses looking after you for some painkillers to keep it under control.

### **How long will it take?**

Every patient's situation is different and it is not always easy to predict how long it will take. The procedure will probably take between 2 to 3 hours. As a guide expect to be in the Department of Diagnostic Radiology for up to four hours.

### **What will happen afterwards?**

At both **stages** you will be taken to the Isotope department on a trolley/stretchers for a scan. This can take up to an hour. You need to stay **flat on your back**. Routine observations, such as your blood pressure and pulse, will be carried out in the department and continued on the ward. You need to stay flat on your back for four hours and remain in bed overnight.

### **How soon can I eat and drink?**

Most patients are able to drink fluids and have something to eat when they are fully awake.

### **Are there any special precautions?**

For stage 2 only: because the treatment is radioactive, there are some simple precautions that need to be taken during the first **24 hours** following the SIRT procedure. These precautions include:

- thorough washing of your hands after going to the toilet
- cleaning up any spills of body fluids such as blood, urine or stools and disposing of them down the toilet.
- 

We will give you more information about these precautions.

### **Are there risks or complications?**

As with any operation or procedure, there are some risks and complications that can arise.

1. There may occasionally be a bruise around the site where the needle has been inserted.
2. Very rarely, some damage can be caused to the artery by the catheter. This may need treatment by surgery or another radiological procedure.
3. You may develop 'post embolisation syndrome' (flu like symptoms). This is caused by the body's response to tumour tissue dying and may consist of sickness, tiredness, pain and fever. The ward staff will give you painkillers and medicine to control any symptoms.
4. You may have some loss of appetite for several days. This will improve over time.
5. In rare instances, there is the possibility that a small number of microspheres may reach other organs in the body, such as the gall bladder, stomach, intestine or pancreas. If Micro-Spheres microspheres reach these organs, they may cause inflammation of the gall bladder (cholecystitis), stomach (gastritis) or intestine (duodenitis). These complications are rare, but if one of these occurs, they normally require additional treatment. Your treatment team will have received special training to minimize these risks and to prevent them from happening.
6. Very rarely radiation treatment to the liver can cause worsening of liver function and jaundice

### **What are the benefits?**

- The SIRT technique allows us to target and destruction the tumours within the liver via the hepatic artery. The exposure to the remaining healthy liver tissue is minimised.
- Used in combination with chemotherapy, SIRT may shrink liver tumours more that chemotherapy alone and life expectancy can increase.
- For a small number of patients, treatment can shrink the liver tumours enough to make it possible to surgically remove the tumours at a later date.
- Quality of life may also improve.
- In patients whose liver tumours are no longer responding to chemotherapy, SIRT has been used successfully to shrink these tumours and extend patients' survival.

### **What are the alternatives?**

You will probably already have had surgery and/or chemotherapy. This may not be an option for you.

### **Signs to look out for:**

- shortness of breath or pain on breathing in
- pain that is not controlled by regular painkillers (e.g. Paracetamol)
- increasing fever or pain more than 1 week after the procedure
- bleeding or swelling in the groin
- jaundice

You should contact **your Consultant** if there is an emergency.

**Contact Details:**

In working hours (09:00-17:00) LION may be contacted via the medical secretaries:

Email: [secretaries@lion-oncology.com](mailto:secretaries@lion-oncology.com)

or

**Telephone: 0207 908 3756**

or

**Fax: 0207 504 8406**

Out of working hours after 17:00 hrs Monday – Friday and at any time at the weekend you may contact the **LION Out of Hours Emergency Number:**

**Telephone: 0207 754 5989**

**Correspondence Address**

Leading Interventional Oncology Network (LION) Ltd  
30 Devonshire Street  
London  
W1G 6PU

**Further information is available from the following:**

**British Liver Trust**

Tel: 01425 463 080

[www.britishlivertrust.org.uk](http://www.britishlivertrust.org.uk)

**Macmillan Cancer Support**

For information booklets, freephone 0808 500 800

For advice from specialist nurses, freephone 0808 800 1234

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

**Cancer Research UK**

[www.cancerhelp.org.uk](http://www.cancerhelp.org.uk)

Provides facts about cancer including treatment choices.

**National Institute for Clinical Excellence**

Tel:0870 1555 455 (ask for publication no NO709)

[www.nice.org.uk/PG093publicinfo](http://www.nice.org.uk/PG093publicinfo)



## Space for notes and questions

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