



Selective internal radiation therapy (SIRT) for tumours in the liver

Welcome to The Christie Clinic

The Christie Clinic is a joint partnership between the world famous Christie NHS Foundation Trust and leading healthcare provider HCA International. Together they have created one of the world's most advanced cancer clinics for private patients.

One of the greatest challenges in treating cancer is that it can travel around the body, causing tumours in different areas (metastases). One of the most common sites to which various cancers spread is the liver. This can prove difficult to

treat. However there has been considerable progress made in the development of treatment, including technologies such as selective internal radiation therapy (SIRT).

It is vital patients are diagnosed early, seen by the right specialist and offered the most effective treatment programme. At The Christie Clinic we offer the highest standards of care and the most up to date treatments, delivered by leading experts in a clean and comfortable environment.

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A world class facility for treatments of all tumours in the liver

The Christie Clinic works with a team of cancer specialists who are experts in the treatment of all types of liver tumours, whether primary (the first location in the body where a cancer grows, e.g. hepatocellular carcinoma) or secondary (also known as a metastasis or metastatic cancer which occurs when cancerous cells spread around the body from a primary site). Most commonly, these liver metastases develop from a primary tumour in the breast, bowel or lung, but can come from anywhere in the body, including neuroendocrine tumours, cholangiocarcinoma and ocular melanoma.

It can be difficult to remove liver cancers with surgery. However, a number of alternatives have been developed and our team of clinicians are highly trained and experienced in the use of selective internal radiation therapy (SIRT) and other complex targeted therapies for treating malignancy in the liver.

Our modern inpatient and outpatient facilities allow patients to experience the finest modern anticancer treatments and cutting edge technology delivered by a highly experienced team of specialists in comfortable surroundings that include:

- 34 en-suite inpatient rooms with entertainment systems.
- 8 outpatient consulting rooms fitted with the latest equipment.
- 12 individual chemotherapy day care pods, each equipped with an entertainment system.
- full support services, including a dedicated dietician and physiotherapist, a team of counselling psychologists, and complementary therapists.

What is SIRT?

Selective internal radiation therapy or SIRT (also known as radio-embolisation) is a form of radiotherapy that has been developed for the treatment of liver tumours that can't be removed by surgery. It is a form of internal radiotherapy, which involves putting microscopic radioactive beads (yttrium-90 microspheres) into the artery that carries blood to the liver.

The patient undergoes two procedures, approximately two weeks apart. The first 'work up' procedure involves assessment of the liver, artery and surrounding area, and preparing the liver blood vessels for the second procedure, when the SIR-spheres are inserted via a catheter, or tube, into the hepatic artery via the groin.

The SIRT procedure enables radiation to be targeted directly into liver tumours by using the tumour's own blood supply. Healthy liver tissue receives around 80% of its blood supply from the portal vein (the vein that delivers blood to the liver from the bowel), with only 20% of its blood supply coming from the hepatic artery. In contrast, tumours draw up to 90% of their blood supply from the hepatic artery. The hepatic artery therefore provides an ideal channel to deliver targeted treatment to the tumour(s) with limited radiation reaching the normal liver.

The radioactive microspheres used in SIRT are small enough to become lodged in the growing tumour where they emit a high dose of radiation, but are too large to escape through the capillaries and into the veins. This means that very little radiation gets into the rest of the blood stream, and the rest of the body.

SIRT contains the radioactive element yttrium-90. This radiation travels only a relatively short distance: a maximum of 11 mm (less than half an inch). In other words, the radiation is highly unlikely to travel out of the patient's body. This means that the patient poses no significant danger to others in close proximity to them. In addition, yttrium-90 has a half life of just 64.1 hours (approximately two and a half days), therefore most of the radiation (over 97%) is delivered to the tumour(s) in the first two weeks following treatment.





An experienced SIRT team at The Christie Clinic

The Christie in Manchester was the first UK cancer centre to set up a SIRT service in 2005 and it remains one of the biggest providers of selective internal radiation therapy in the country. The service started with private patients and expanded in 2009 when our audited results from this treatment led to the NHS commissioning us to provide SIRT for NHS patients within our network.

Our multidisciplinary team includes medical and radiation oncologists, interventional radiologists, nuclear medicine specialists, liver surgeons and specialist nurses. Patients being considered for SIRT should be referred to an oncologist within the SIRT team.

SIRT team

Consultant Oncologists



Dr Gregory Wilson MBChB, DRCOG, FRCP, Dip Onc

Consultant Medical Oncologist

Interests: breast cancer, colorectal cancer, targeted liver therapies, carcinoma unknown primary

Dr Greg Wilson is Lead Clinician for the SIRT programme at The Christie and treated the first patient with SIRT at The Christie in 2005. He is a member of the European Society of Medical Oncology (ESMO) and American Society of Clinical Oncology (ASCO) and has lectured extensively on the use of SIRT for the treatment of malignancy in the liver including breast and colorectal cancer. Dr Wilson has a particular interest in the management of complex secondary cancer in the liver. He is an active member of the breast and colorectal cancer disease groups at The Christie.

website: www.drgregwilson.co.uk twitter: @uk_oncologist



Professor Juan Valle MBChB, MSc, FRCP

Consultant Medical Oncologist

Interests: hepatopancreatobiliary, hepatocellular and neuroendocrine tumours

Professor Juan Valle is Lead Clinician for the Hepatobiliary and Neuroendocrine Tumour Service at The Christie. He is a member of the UK National Cancer Research Institute (NCRI) upper gastrointestinal clinical studies group, a member of the pancreatic cancer and hepatobiliary subgroups, and he chairs the neuroendocrine subgroup. Professor Valle is also a member of the following professional societies: ESMO, ASCO, UKI NETS (UK and Ireland Neuroendocrine Tumour Society) and ENETS (European Neuroendocrine Tumour Society).







Dr Saifee Mullamitha MBBS, MD, FRCP

Consultant Medical Oncologist

Interests: colorectal cancer, targeted liver therapies, carcinoma unknown primary

Dr Saifee Mullamitha is a consultant medical oncologist with a dedicated and specific interest in the personalised management of colorectal cancer. He is a lead principal investigator and co-investigator in a number of national as well as international clinical trials. Apart from patients within the region, Dr Mullamitha has co-ordinated treatment plans such as SIRT (colorectal/breast cancer) or PTC, etc. for patients from outside Manchester. He has an interest in the management pathways, clinical trials and investigation for cancers from unknown primary. Apart from his educational portfolio Dr Mullamitha is also an examiner with the South Manchester University Hospitals.



Dr Jurjees Hasan MSc, MD, FRCP

Consultant Medical Oncologist

Interests: colorectal cancer, targeted liver therapies, gynaecological malignancy

Dr Jurjees Hasan is a consultant medical oncologist with interests in colorectal and gynaecological malignancy. He also maintains an interest in translational research into the development of new strategies for the management of malignant bowel obstruction and liver-directed therapies for colorectal cancer. Dr Hasan is a member of the colorectal team and the lead medical oncologist for gynaecological malignancies for South Manchester.

Consultant Radiologists



Dr Jeremy Lawrance MBChB, MRCP, FRCR

Consultant Interventional Radiologist

Interests: oncological radiology, vascular interventional radiology

Dr Jeremy Lawrance is the lead interventional vascular radiologist and is a divisional medical director at The Christie. He performed the first SIRT procedure at The Christie in 2005 and performs multiple interventional vascular radiology procedures as part of the SIRT and other programmes. Dr Lawrance and his team have developed the SIRT service at The Christie into one of the leading SIRT centres in Europe.



Dr Hans-Ulrich Laasch MRCP, FRCR, CCST

Consultant Interventional Radiologist

Interests: oncological radiology, interventional radiology

Dr Hans-Ulrich Laasch is the interventional lead for The Christie with particular interest in hepatobiliary intervention, GI stents, nutritional support and sedation. He undertook a four year fellowship in interventional gastrointestinal radiology and endoscopy and is a Fellow of the European Society of GI and Abdominal Radiology. The Radiology department at The Christie is a reference site for 6 device companies, and Dr Laasch plays an active role in education on a national and international level and is a technical advisor for the National Institute of Clinical Excellence (NICE).



Dr Damian Mullan MBChB BAO, MRCS, MCEM, FRCR, FFR (RCSI)

Consultant Interventional Radiologist

Interests: oncological radiology, vascular and GI interventional radiology

Dr Damian Mullan is a consultant interventional radiologist at The Christie. He holds fellowship by examination of both Irish and UK Royal Colleges. Dr Mullan trained in surgery and emergency medicine in Dublin, prior to commencing clinical radiology training in Liverpool, and completed a fellowship programme in interventional radiology at The Christie before his appointment as a consultant in 2010. He specialises in gastrointestinal, vascular and oncological intervention.









Dr Jon Bell BSc, MBChB (Hons), MRCS (Eng),
FRCR, EBIR, PGCertMedEd, MAcadMEd

Consultant Interventional
Radiologist

Interests: oncological radiology,
interventional oncology including vascular and non-
vascular procedures

Dr Bell is a consultant interventional radiologist at The Christie. After graduating with honours from the University of Manchester, he trained in surgery and clinical radiology. He then completed higher subspecialty training in interventional radiology in Manchester and has completed the European Board of Interventional Radiology (EBIR). Dr Bell is a member of the Faculty Board of the Royal College of Radiologists and the Safety and Quality Committee of the British Society of Interventional Radiology.

Patient pathway

Worldwide data has shown that SIRT is a highly effective treatment for multiple tumour types in the liver. Patients being considered for SIRT should be referred to an oncologist within the SIRT team. The patient will usually have an oncology consultation before their case is presented to the multidisciplinary SIRT/hepatobiliary team.

The multidisciplinary team (MDT) is made up of a range of clinicians, including oncologists, radiologists, hepatobiliary surgeons and other members of the SIRT team. It meets weekly to discuss each patient's treatment plan and ensure that each patient is receiving the optimum care at every stage.

Every case is reviewed on its individual merits and a decision is made as to whether the patient:

- Should be offered SIRT within the context of their specific cancer problem.
- Is fit for the procedure.
- Is suitable for SIRT from a technical point of view.

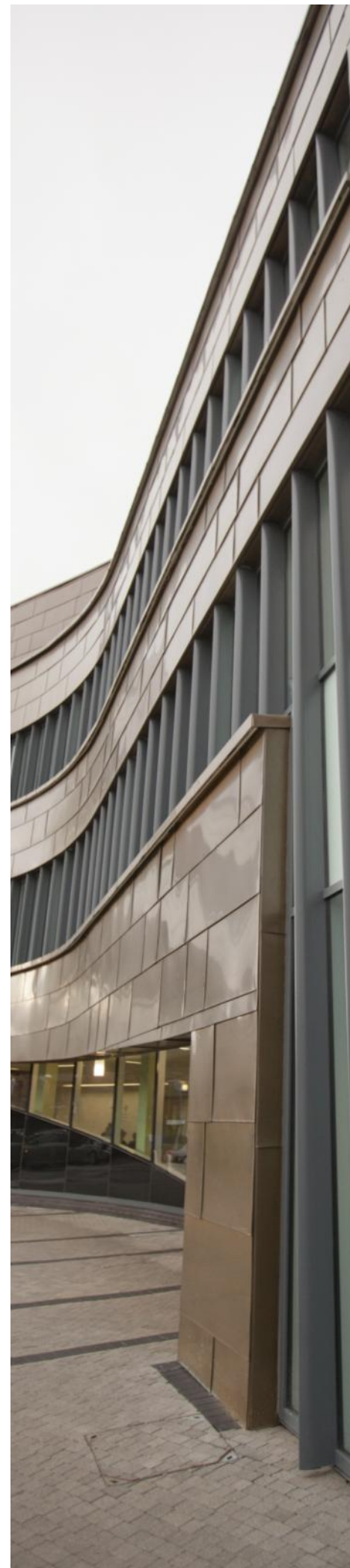
If they feel it is more appropriate, the team may recommend a treatment programme which does not involve SIRT, such as liver surgery, radiofrequency ablation, cryotherapy, microwave therapy, intrahepatic chemotherapy, peripheral chemotherapy, immunotherapy, targeted radiotherapy or a combination of treatments.

At this point a treatment plan is prepared to offer to the patient, and dates are provisionally agreed.

Sometimes, especially if the patient has not been seen by one of the oncologists prior to the meeting, the team may feel that they cannot give a comprehensive recommendation.

Chemotherapy with SIRT

Often, though not always, a course of chemotherapy is recommended as part of the treatment programme. Patients usually have chemotherapy around the time when the SIR-spheres are inserted, and often have a course of chemotherapy afterwards. Chemotherapy works with SIRT and makes it more effective. It also protects against any tumour cells which may be spreading around the body at this time.





SIRT patient pathway

Once it has been decided that a patient is suitable for SIRT, arrangements are made for two procedures.

SIRT 1 (preparation of the liver for SIRT 2)

The first SIRT procedure is to prepare the liver for insertion of the SIR-spheres (microscopic radiotherapy beads) which takes place during SIRT procedure 2. This involves a short inpatient stay at The Christie Clinic, with blood tests and a trip to the radiology department. Patients often only need to be admitted for one night. The procedure takes place in the interventional radiology suite and involves insertion of a catheter (tube) into the groin which is fed into the liver via the hepatic artery.

Contrast agents (liquids which show up clearly on scans) are injected into the liver via the catheter and multiple x-rays are taken. The contrast agents allow the consultants to see the blood vessels in the liver, where the SIR-spheres are to be placed, and check there will be no problems with the treatment. The radiologist inserts small coils into certain blood vessels to block them off, ensuring that, when it comes to SIRT 2, the radiation beads cannot exit the liver. The patient has another scan after this procedure to double check the area. Patients are normally kept in until the next day and then discharged.

SIRT 2 (insertion of the SIR-sphere microscopic radiation beads)

The second SIRT procedure takes place approximately 2 weeks after SIRT 1. This usually involves admission to The Christie Clinic for at least one night. Patients often have chemotherapy around the time of this procedure, and may already be receiving chemotherapy as an inpatient.

The patient is taken to the interventional radiology suite. The liver blood vessels were prepared in the first procedure and, once again, a catheter is introduced into the hepatic artery via the groin. The SIR-spheres are injected into the catheter via a syringe. The patient stays with us overnight and a repeat scan usually takes place the day after the procedure. If the team is happy that the SIR-spheres are in place and there are no problems, then the patient may be discharged, dependent on their treatment programme, returning for a follow up appointment about two weeks after the procedure.



Making a referral

If you would like to refer a patient for SIRT or any other targeted liver therapies, please contact us through our referral helpline, enquire via our website or fax a referral letter.

In order to assess the case we need digital copies of all prior scans, either sent on disc or transferred via secure wire transfer.

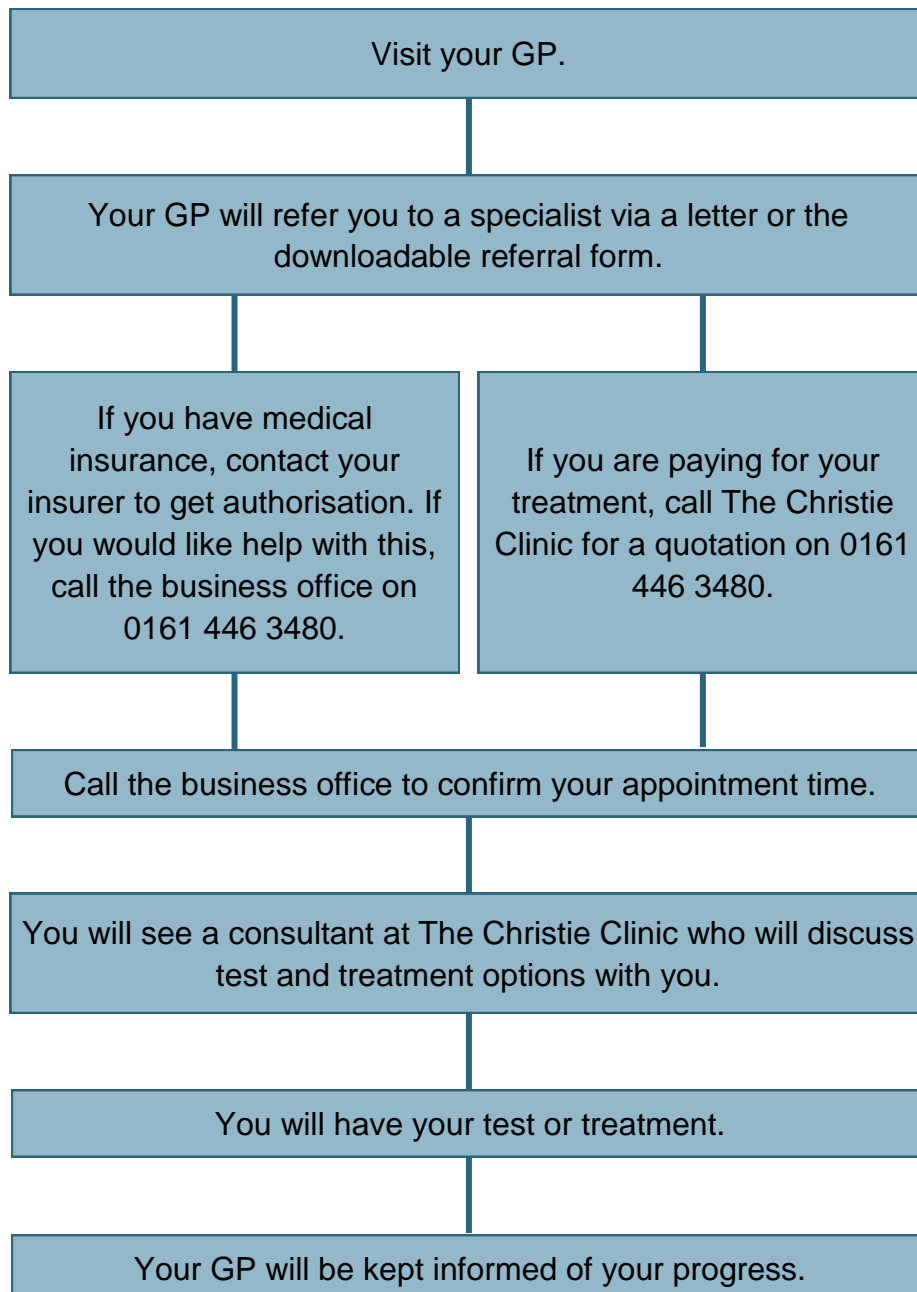
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