Case Notes

News · Case Studies · Insight

From Royal Brompton & Harefield Hospitals · London

Winter 2018

RB&HH
SPECIALIST CARE

Welcome to the Winter 2018 edition of *Case Notes*

David Shrimpton
Managing Director,
RB&HH Specialist Care

Welcome to a new year at RB&HH Specialist Care.

It's an exciting time for our team; we will be attending Arab Health Exhibition and Congress in Dubai this January and bringing two of our surgeons with us to perform surgical simulations at the event. You can read more about Thoracic Surgeon Ms Emma Beddow on page 6 and Cardiac Surgeon Mr Cesare Quarto on page 2.

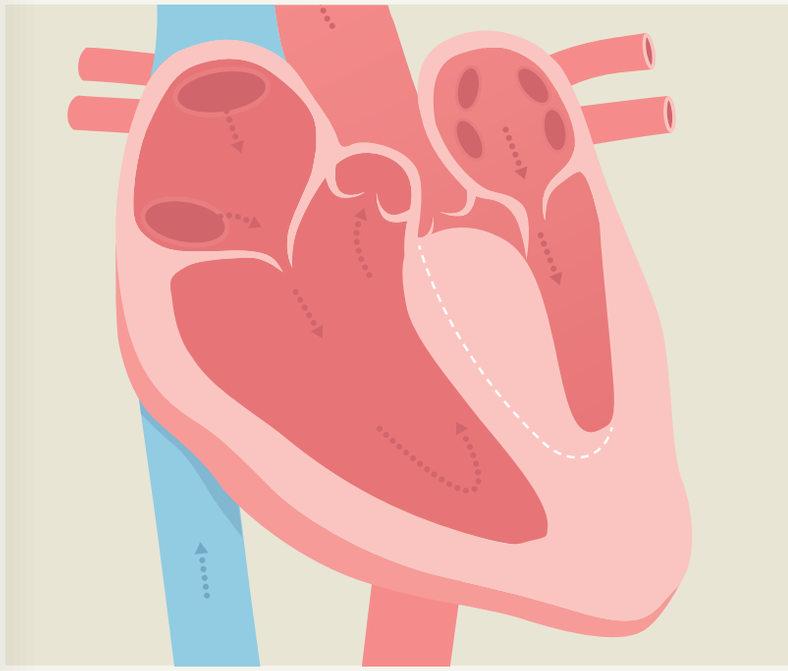
This issue reviews some of our most innovative and unique procedures from over the last few years. Read about the amazing work our team are undertaking for patients who will benefit from an implanted left ventricular assist device (LVAD) on page 14. There is also a feature on the CardioMEMS™ device that is being used to monitor heart failure patients on page 12.

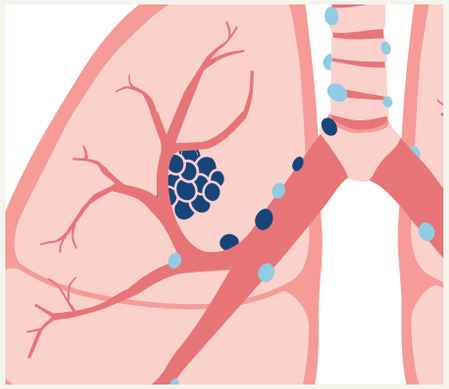
It is the dedication of our diverse team here at RB&HH that ensures we remain a world leader in providing treatment for heart and lung disease, with quality of-care that is second-to-none.

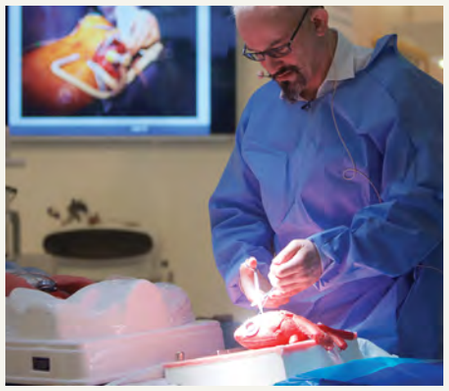
privatepatients@rbht.nhs.uk
www.rbhh-specialistcare.co.uk

RB&HH
SPECIALIST CARE

Contents







FIRST PATIENTS BENEFIT FROM PIONEERING TREATMENT FOR AORTIC VALVE DISEASE

RB&HH experts hope the new Ozaki procedure could revolutionise the way surgery is carried out for patients with the life-threatening condition.

As one of the country's largest and most experienced centres for the diagnosis and treatment of heart valve disease, Royal Brompton Hospital (RBH) has a long history of pioneering medical innovations that have increased treatment options and improved the lives of patients with the condition.

The groundbreaking Ozaki procedure is the latest cutting-edge technique to be implemented at RBH to benefit patients who require aortic valve surgery. It is the first time that surgeons in the UK have been able to use heart tissue from an animal to reconstruct a damaged aortic valve, instead of replacing it entirely with a prosthetic implant.

The aortic valve controls the flow of blood from the heart to the rest of the body. When its function is impaired, for example, through aortic stenosis (narrowing of the valve), aortic valve regurgitation (a leaking valve), or because of a congenital heart defect, surgery is usually required to replace it and restore normal function. If left untreated, a poorly-performing aortic valve can seriously reduce a patient's quality of life and eventually lead to heart failure and death.

Surgeons carrying out conventional aortic valve replacements commonly use a mechanical implant made from synthetic materials, which requires the patient to take lifelong anticoagulant drug therapy to protect against harmful blood clots. Patients can, however, experience side effects and taking the medication indefinitely has lifestyle limitations.

Alternatively, biological implants made from animal tissue do not require blood-thinning drug therapies (typically warfarin in the UK), but they degenerate and usually need to be surgically replaced after around eight to 15 years, depending on the patient's age (degeneration occurs more quickly in those under 60), or even more frequently for children who outgrow their valve.

Data from Japan, where the Ozaki procedure originated ten years ago, shows the new technique, now being adopted by surgeons at RBH, is longer lasting than replacing the valve entirely. The heart tissue used to repair the valve is specially-treated in a laboratory to ensure it does not degenerate and to eliminate the risk of rejection by the body's immune system.

The surgical team at RBH believes the new procedure also has advantages over the complex 'Ross' procedure, which is a more invasive operation that involves replacing the diseased aortic valve with the patient's pulmonary valve, and replacing their pulmonary valve with a valve from a deceased donor.

Under the guidance of consultant cardiac surgeon, Mr Cesare Quarto, the team at RBH carried out the first adult Ozaki procedure in the country in 2016 and is the UK's only unit that is able to provide the treatment to adult patients. Meanwhile, paediatric cardiac surgeon, Mr Olivier Ghez, who performed the very first Ozaki procedure at RBH, offers the treatment to children and young adults as an alternative to valve replacement surgery.

Mr Quarto said: "This is an exciting development for patients in need of aortic valve surgery. Experts in Japan have followed hundreds of patients who had this procedure almost ten years ago. The evidence shows it can be a longer term solution than the alternative options due to its more natural physiology.

"As a specialist centre for patients with congenital heart disease and acquired cardiac problems, we are always striving to provide patients with the very best and most advanced treatment options. Our early results for patients who have undergone this new procedure at Royal Brompton are extremely encouraging and we hope many more patients will benefit from this novel technique in the future."

Mr Cesare Quarto (left) and Mr Olivier Ghez (right) with Professor Shigeyuki Ozaki at Royal Brompton Hospital

Mr Olivier Ghez added: "The main advantage of this procedure for younger patients is that it delays any further problems with their aortic valve and allows them to lead an active life, without needing to take ongoing medication to prevent blood clots."

The procedure

The technique was pioneered by Japanese heart surgeon, Professor Shigeyuki Ozaki, and uses tissue from the membrane surrounding the heart (the pericardium) to reconstruct the damaged aortic valve. In the UK, surgeons use a treated patch of animal pericardium that prevents calcification, removing surface antigens to ensure it is long-lasting.

The procedure takes place in RBH's state-of-the-art hybrid operating theatre, where surgeons use specialist equipment and imaging technology to measure the diseased part of the valve and cut the replacement tissue to the exact size. This means the whole valve does not have to be replaced. Once the tissue is sewn on to the aortic valve it behaves in a similar way to the original valve tissue and restores its normal function.

The operation lasts for around four hours and patients will usually spend a total of 5–6 days in hospital, which is similar to valve replacement surgery.

Patient suitability

The Ozaki procedure is available to the majority of patients who would usually be considered for aortic valve replacement. The only exception is a patient who has experienced an aneurysm of the aortic root.

Due to the durability of the technique, it is particularly beneficial for patients under the age of 60, for whom a valve replacement would commonly last no longer than eight years. Prosthetic valve replacements typically last longer (15 years) for older patients as their metabolism works more slowly, which affects the speed of degeneration.

A standard heart test (echocardiogram) is sufficient to show the problem with the aortic valve and its shape, from which RB&HH surgeons can determine a patient's suitability for the procedure.

To find out more or refer a patient please contact the private patients team on +44 (0)2031 310 535 or email privatepatients@rbht.nhs.uk

AT A GLANCE

PROCEDURE
Reconstruction of diseased aortic value function

CARRIED OUT BY
Mr Cesare Quarto – Adult surgery
Mr Olivier Ghez – Pediatric surgery

WHAT PROBLEMS DOES IT SOLVE?
Re-constructive surgery restores normal function of the impaired aortic valve.

HOW DOES IT WORK?
Instead of replacing the damaged aortic valve entirely with a prosthetic implant it is reconstructed using heart tissue from an animal.

WHAT ARE THE ADVANTAGES?
Biological implants made from animal tissue do not require blood-thinning drug therapies.

Due to the durability of this technique and its natural physiology it prevents calcification and it is longer lasting than replacing the valve entirely.

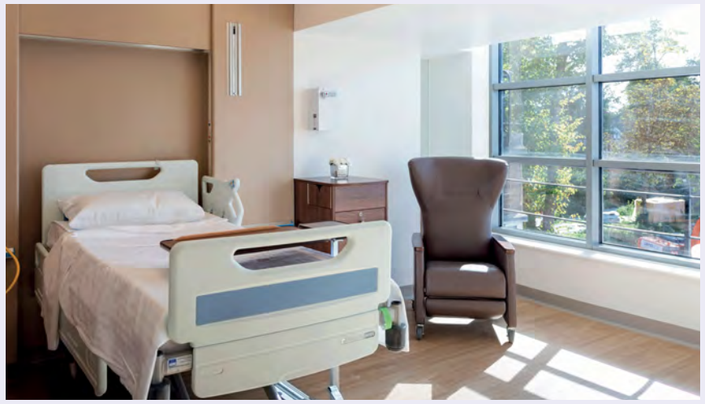
The reconstructed valve will need replacement after eight to fifteen years, depending on the patient's age.

It is particularly beneficial for patients under the age of 60, for whom a valve replacement would commonly last no longer than eight years.

NEW FACILITIES

In recent years our private patients business has grown exponentially and so we have made improvements to our facilities in order to meet the growing patient demands. We have introduced a new private outpatient facility and private ward at Harefield Hospital as well as our new central London outpatients and diagnostics facilities at 77 Wimpole Street.

Harefield Hospital Private Ward and Outpatients



> **Harefield is already unique in that it offers world class care within a quiet and beautiful setting. Now, with our larger and new Juniper Ward we can provide superb facilities for the comfort of all our patients.**
>
> **Gerri Hamer,**
> **Private Patients Manager,**
> **Harefield Hospital**

As a centre of excellence RB&HH has long offered patients the expertise of our world-leading consultants at our Harefield site, we are excited to have expanded our facilities to include a brand new state-of-the-art private ward (Juniper Ward) and new outpatients and diagnostic suites.

Private, self-funding, and international patients can now arrange appointments with our heart and lung specialists, and be seen in our new private patient facilities which include:

- 16 spacious private rooms
- New outpatient consulting rooms and diagnostic suites
- A rapid diagnostics service including MRI, Echocardiography, CT, Lung Function and Non-Invasive test all available same-day or short-notice
- Specialist heart and lung screening services
- Respiratory and Cardiology Consultations

Contact information

Address
Harefield Hospital
Hill End Road Harefield, UB9 6JH

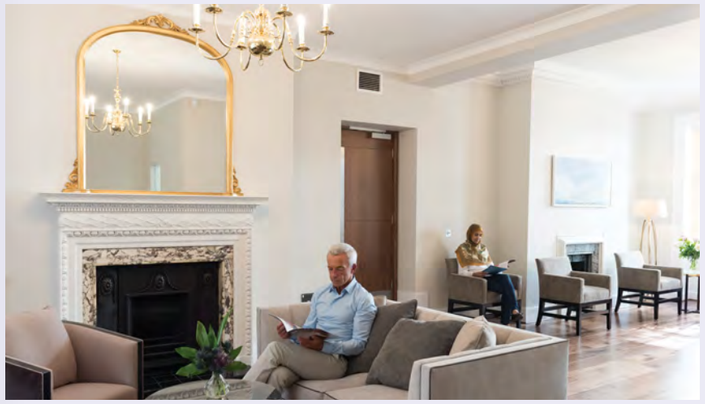
Opening Hours
8am–9pm Mon–Fri

General enquires & appointments
020 3131 6859 or email
privatepatients@rbht.nhs.uk

PET CT

Rubidium 82 is a PET tracer with a very short halflife of 75 seconds, which allows for the procedure to be completed in less than an hour (an imaging time of roughly 30 min) as opposed to 4+ hours for routine SPECT imagine, also significantly reducing the radiation burden to patients.

77 Wimpole Street Outpatients and Diagnostics



> **Patient service is at the heart of our new facility. We have the leading cardiac and respiratory specialists working at Wimpole Street and we are committed to delivering world-class care.**
>
> **Zohreh Palmer,**
> **General Manager, 77 Wimpole Street**

Based in the renowned Harley Street Medical Area, our Wimpole Street facility delivers outpatient and diagnostic care for patients presenting with diseases that impact their cardiovascular or respiratory health.

Consultations and multiple tests can be scheduled on the same day, in the one location, five days a week. This facilitates a 'one-stop' approach removing the burden of multiple appointments and unnecessary travel for the patient.

We offer the following services for same-day or short-notice appointments;

- Respiratory and Cardiology Consultations
- PET-CT (Rubidium Cardiac, Oncological and Neurological)
- CT (cardiac, lung and general)
- MRI (cardiac and general)
- Non-invasive cardiology including Cardiac Monitoring, Exercise Tolerance Tests and ECG
- Echocardiography (stress and contrast)
- Lung Function
- Chest X-ray

Contact information

Address
RB&HH Specialist Care
Outpatient & Diagnostics
77 Wimpole Street London, W1G 9RU

Opening Hours
8am–9pm Mon–Fri

General enquires & appointments
020 3131 6859 or email
privatepatients@rbht.nhs.uk

Diagnostic enquiries
020 7351 8186 or email
rbh-tr.diagnosticwimpole@nhs.net

VATS Lobectomy or Traditional Lung Cancer Surgery?

Lung cancer is the third most common cancer in the UK and accounts for approximately 13% of all cancers. It also has the highest mortality rate in the UK for both males and females. But with two different surgical approaches available, it is not always clear what option would be best.

Emma Beddow
Consultant Thoracic Surgeon
Harefield Hospital

AT A GLANCE

PROCEDURE
VATS lobectomy

CARRIED OUT BY
Ms Emma Beddow (pictured)
Mr Vladimir Anikin
Mr Simon Jordan
Mr Eric Lim

WHAT PROBLEMS DOES IT SOLVE?
The length of the incision is smaller than previously done in traditional lobectomy.

HOW DOES IT WORK?
Surgery removing lobes of the diseased lungs and lymph node clearance, combined with oncological input for drug treatment, patients are given a chance of life-saving treatment.

At the Royal Brompton and Harefield Hospitals, we work closely together across the lung cancer MDT to push the boundaries in finding cures for patients. Those patients who have been turned down for surgery elsewhere have had successful surgery with us. These include patients with cancers involving the chest wall and sternum, cancer infiltrating the outer layer of the oesophagus, and those with PET-positive mediastinal lymph nodes and limited disease outside the chest.

All these patients were offered palliative treatment at their local hospital and sought a second opinion with us. With a combination of surgery and oncological input, all were kept alive and well for at least 30 months after treatment.

Large tumours requiring complex surgical reconstruction of the remaining airways are also referred to our team for treatment. Surgery involves removing one or more lobes of the diseased lung along with, if necessary, parts of the rib cage and large blood vessels.

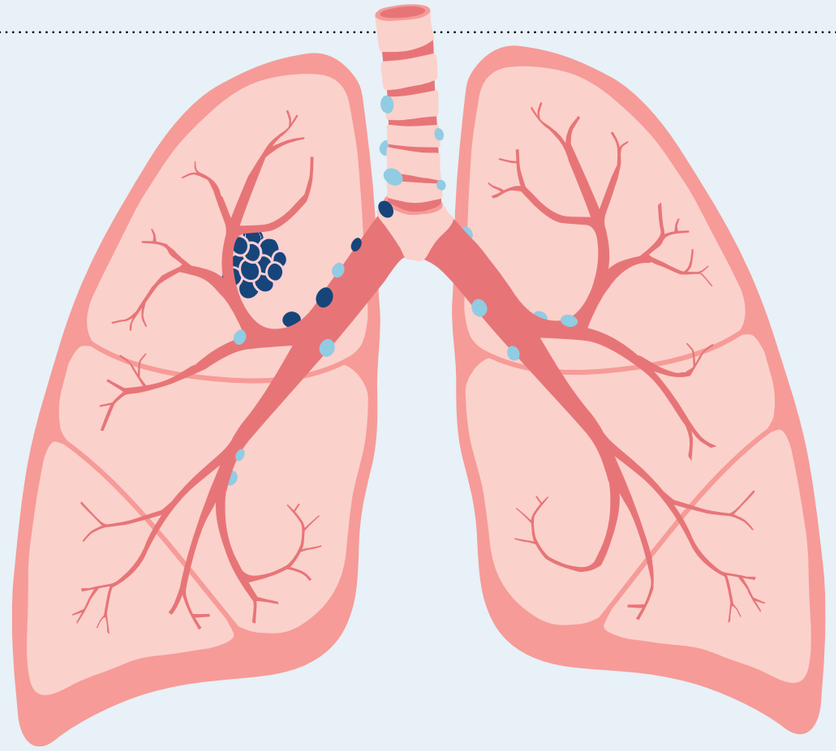
In all cases, a complete mediastinal lymph node clearance is undertaken. This most accurately stages the extent of disease and limits further spread of tumour cells outside the lung, therefore improving prognosis.

With the advent of new immunotherapy drugs for lung cancer, more people are being offered a chance of life-saving treatment. Our lung cancer team works very closely with our specialist oncology colleagues to ensure we explore every option when planning treatment, to enable us to achieve the best outcome for all patients. Each case of lung cancer is discussed at our specialist lung cancer MDT and we agree the optimal management plan for that case.

Different surgical approaches

In recent years, there has been a shift towards offering patients keyhole surgery and smaller incisions with no rib spreading. This approach is known as the VATS lobectomy.

The traditional posterolateral thoracotomy has been significantly modified so that the length of the skin incision is considerably smaller than that performed 10 years ago and rib spreading is far less than previously done.



Right upper lobe tumour with limited ipsilateral lymph node disease noted by dark blue lymph nodes. Light blue nodes are free of tumour.

> **In recent years there has been a shift towards offering patients keyhole surgery and smaller incisions with no rib spreading. This approach is known as the VATS lobectomy.**

Muscles may or may not be cut, depending on the surgeon. All approaches generally heal very well with smaller, neat scars.

Key questions about lung cancer surgery

Some of the common questions that arise when considering whether to offer a VATS lobectomy or traditional surgery include:

- **Is the amount of lung removed the same?**
  Yes, a lobectomy may be done with either approach.
- **What procedure will cause the least amount of post-operative pain?**
  The immediate postoperative pain is generally agreed to be less with VATS surgery compared to open thoracotomy. However, at six weeks post-operative, many papers report conflicting results.
- **How does the survival rate for VATS surgery compare with a traditional thoracotomy?**
  This relates to early or potentially curative disease. There is a slight perioperative advantage with VATS however the 5 year survival is the same. Our decisions depend on the wider context of illness for each individual patient.

Removing lymph nodes

In general, the lymph nodes tend to be completely removed with an open thoracotomy. With the VATS approach, this is not the case. An American study demonstrated that in a small number of patients, lymph node tissue containing cancer cells was left inside the patient.

These patients would not typically be offered any chemotherapy post-surgery as they would have been thought to be clear. This would put them at risk of developing further complications and illness from the remaining cancerous tissue. At the Harefield, we mitigate this by offering VATS surgery only to the earliest tumours.

Cancer treatment at Harefield

Royal Brompton and Harefield Hospitals still offer surgery to patients when their disease has spread outside the chest. If there is limited spread of disease to lymph nodes, they may be offered a combined approach of chemotherapy and surgery.

In potentially curable cancer, surgery offers patients the best chance while non-surgical options such as SABR and conventional radiotherapy give around half the survival rates compared to surgery.

We know that being diagnosed with lung cancer is very frightening and we strive to make our patients' pathways from diagnosis through to treatment and follow up as efficient and as positive as we can.

We are here to support them and their families all the way through your journey.

To find out more or or refer a patient please call +44 (0)2031 316 858 or email privatepatients@rbht.nhs.uk

Severe Emphysema treatment

RB&HH Consultants offer the very latest in treatment options to help patients suffering from chronic emphysema find the solution that best suits them.

AT A GLANCE

PROCEDURES
Endobronchial Valves, Lung Volume Reduction Coils, Lung Volume Reduction Surgery

CARRIED OUT BY
Dr Samuel Kemp, Prof Pallav Shah and Mr Simon Jordan

WHAT PROBLEMS DOES IT SOLVE?
This offers multiple approaches to improve quality of life and improve lung function in patients with severe emphysema.

HOW DOES IT WORK?
Endobronchial Valves: Used to restrict airflow to diseased areas of the lung.

Lung Volume Reduction Coils: Coils used to reduce over-inflation of the lungs.

Lung Volume Reduction Surgery: Operation used to remove the worst affected areas of the lung so that the healthy areas can work better.

Emphysema is a long-term progressive disease of the lungs that causes difficulty in breathing. It is included in a group of diseases called chronic obstructive pulmonary disease, or COPD. In emphysema, there is damage to the lung tissue which can lead to the lungs becoming over inflated. Common symptoms of emphysema are difficulty breathing, coughing, fatigue and weight loss.

Treatment may include pulmonary rehabilitation advice (guidance on smoking cessation, patient and carer education, exercise training and breathing retraining) and use of inhaled or oral bronchodilators and glucocorticoids. In advanced disease, lung volume reduction surgery or lung transplantation may be indicated; however recent advancements in treatment of emphysema have brought to the forefront minimally invasive alternatives to thoracic surgery.

Endobronchial Valves

The endobronchial valve is an implantable device designed to obstruct bronchi in diseased regions of the lung and to allow for the expiration of air from the treated lobe of the lung. When used for the appropriate patients Endobronchial valves reduce hyperinflation which manifests in clinical improvement.

During the insertion of endobronchial valves, a small flexible camera is moved down the windpipe and small one way valves are inserted into selected airways (3 or 4 valves are usually inserted). The valve is designed to prevent air inflow during inspiration but to allow air and mucus to exit during expiration. The aim of the procedure is to prevent air entering the diseased parts of the lung which then collapse.

Before the procedure, it is usual practice to assess the presence of collateral ventilation (when air enters a lobe of the lung through a passage that bypasses the normal airways). A surrogate for this is CT scanning to assess the completeness of fissures. A functional approach, specially developed for use before insertion of airway valves, involves a specially designed balloon catheter with a flow sensor.

Insertion of endobronchial valves is done with the patient under sedation or general anaesthesia. Using a delivery catheter passed through a bronchoscope, a synthetic valve is placed in the target location and fixed to the bronchial wall. Patients may sometimes be given antibiotics and/or steroids after the procedure. A successful procedure has been shown to improve patient survival as well as symptoms.

Lung Volume Reduction Coils

Early this year a new innovative service was launched at the Royal Brompton and Harefield Hospitals in London, to treat severe emphysema patients. Lung volume reduction coils are implanted into the diseased parts of the patient's lung during a minimally invasive procedure, typically taking only 30–45 minutes per procedure. Treatment involves two separate procedures, for each lung, 4–6 weeks apart. This treatment helps to reduce over-inflation of the lungs in severe emphysema patients, resulting in a reduction in difficult or laboured breathing.

During the procedure PneumRx® coils are used, which are made of a shape-memory material called Nitinol, common in medical implants such as heart stents. The PneumRx® coils are implanted into the airways via a catheter, and once in place are designed to gently regain their shape, gathering up loose, inelastic lung tissue and holding open surrounding airways. Ten or more coils are placed at each procedure to tighten the entire airway network and achieve the optimal effects.

The coils improve a patient's lung function in three ways. Firstly, they compress diseased tissue, which provides room for healthier tissue to function; secondly, they re-tension portions of the lung involved in gas transfer, helping to increase the lung's elasticity, which may enable the lung to more efficiently contract during the breathing cycle; finally, the coil tethers open small airways, preventing airway collapse during exhalation.

Pulmonx Zephyr (R) Endobronchial Valve System

Lung Volume Reduction Surgery (LVRS)

LVRS is an operation which removes the worst affected areas of the lung so that the healthier parts of the lung can work better. Also, by removing the 'swollen' air spaces, less air is trapped so the chest and diaphragm can relax down to a more normal level and breathing is more comfortable.

A surgeon will make a cut in one side of the chest to use a special tool to cut and staple the lung at the same time. This will seal it and prevent or reduce any air leaks. Patients will be given a general anaesthetic and will stay in hospital for about 7–10 days to recover.

Lung volume reduction surgery can help patients live longer, increase ability to exercise and improve quality of life, compared with people who don't have the operation.

This is a significant operation and it does carry a risk of complications that could be life-threatening. This is why people will only be selected as suitable for this operation if they meet certain criteria. It can also mean a long stay in hospital to recover from the operation.

LVRS is only a suitable treatment for a minority of people who have COPD. It is only effective for emphysema and you may not be suitable if you have other lung conditions such as bronchiectasis and asthma.

This may be offered if:

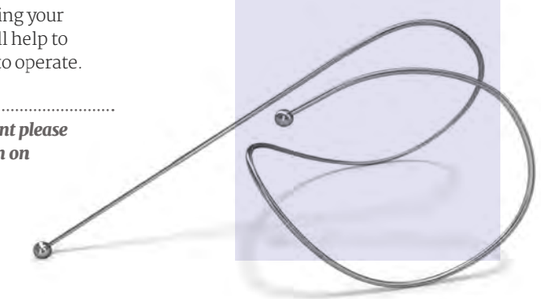
- The patient has a particular pattern of emphysema, and
- The patient has a suitable pattern of lung function, and
- The patient is well enough to cope with the operation.

To assess a patient's suitability for emphysema treatment, the following will be arranged:

- A CT scan, which is a special X-ray to get a picture of a cross-section of your body.
- Lung function tests to measure
  – How good the lungs are at taking in oxygen.
  – How much air is left in the lungs after a maximum breath in and out.
- A test to measure the ability to exercise. If the patient is unable to walk 140 metres in six minutes, it may not be safe to go ahead with the operation.
- A lung perfusion scan sometimes called a VQ scan may also be arranged. The scan works by injecting the patient with a special material that shows up areas of the lung that do not have much blood supply when they are scanned. These areas are not helping your breathing, so the test will help to decide where and when to operate.

To find out more or refer a patient please contact the private patients team on +44 (0)2031 310 535 or email privatepatients@rbht.nhs.uk

PneumRx® coils ▶



CONSULTANT PROFILES

Doctor Samuel Kemp
Respiratory physician

Professor Pallav Shah
Consultant Physician

Mr Simon Jordan
Consultant Thoracic Surgeon

RB&HH's Female Leaders
in cardiac and respiratory care

RB&HH Specialist Care has a wide range of specialists and support staff who are diligent, professional and understanding. These include a range of talented female consultants who are leaders in cardiac and respiratory care. We are proud to have them on our team and available to help those patients who request a female doctor to care for them.

Cardiology

Dr Aigul Baltabaeva
Consultant cardiologist

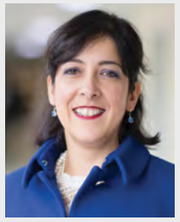
Non-invasive consultant cardiologist who provides front line clinical care for in and out-patients in general cardiology as well as high-end imaging such as Echocardiography (including complex modalities such as TOE, Stress Echocardiography, Trans-cranial Doppler, 3D, Strain/Strain Rate and Contrast Imaging); also Cardiac Magnetic Resonance Imaging.

Dr Sabine Ernst
Consultant cardiologist

Consultant cardiologist, focused on catheter ablation of complex arrhythmias with a special emphasis on atrial fibrillation and ventricular tachycardia.

Dr Rebecca Lane
Consultant cardiologist

Consultant interventional cardiologist with extensive experience in managing patients with coronary artery disease, valve disease, heart failure and arrhythmias. Dr Lane also developed and runs the rapid access heart failure service at Harefield.



Dr Shelley Rahman Haley
Consultant cardiologist

Consultant cardiologist with a particular interest in adult heart valve disease, particularly complex mitral and aortic valve disease and transoesophageal echocardiography and has an interest in cardio-oncology, or heart problems in cancer patients, often those who are undergoing chemotherapy or other treatment which may affect the heart.

I work with breast cancer patients, many of whom are mothers of young children, and I think it can be helpful for them to be able to discuss their fears with another woman, who is also a mother.

Dr Abtehale Al-Hussaini
Consultant cardiologist

General and interventional consultant cardiologist with interest in percutaneous coronary angioplasty, cardiac imaging including CT and MRI. She also specialises in acute and general medicine and has a broad clinical interest in general cardiology with extensive experience in treating coronary artery disease including percutaneous procedures and cardiac and vascular disease in women.

Cardiac Surgery

Ms Rashmi Yadav
Consultant cardiac surgeon

Consultant cardiac surgeon with special interest in minimally invasive coronary artery bypass (CABG) surgery, total arterial sequential grafting using bilateral IMA (internal mammary artery), and endoscopic conduit harvesting.

Thoracic Surgery

Ms Emma Beddow
Consultant thoracic surgeon

Consultant thoracic surgeon with special expertise in lung cancer surgery, major airway surgery and stenting, mediastinal tumours, metastatectomy, benign and malignant pleural disease and pectus surgery

In my first year as a qualified doctor I did six months in cardiothoracic surgery and was mesmerised. I realised how hard it would be though – there were very few female cardiothoracic surgeons.

Respiratory Medicine

Dr Alanna Hare
Consultant in respiratory and sleep medicine

Consultant in respiratory and sleep medicine with specialist interest in sleep disorders including sleep apnoea, the restless legs syndrome, periodic limb movement disorder, insomnia and parasomnias and runs specialist clinics in sleep disorders, respiratory failure and domiciliary ventilation.

Professor Anita Simonds
Professor in respiratory and sleep medicine

Professor in respiratory and sleep medicine with particular expertise in the diagnosis and treatment of sleep disorders, including obstructive sleep apnoea..

Paediatric Cardiology

Dr Nitha Naqvi
Paediatric cardiologist

Paediatric cardiologist, lead in paediatric echocardiography, and paediatric cardiac network lead.

Paediatrics was the perfect speciality for me, as I love being with children. I chose cardiology because the heart is the most fascinating organ in the body.

There are many times when it can actually be an advantage to be a female paediatric cardiologist. Teenage girls, in particular, often prefer to see a woman especially to perform echocardiograms (heart scans).

Dr Jan Till
Paediatric cardiologist

Dr Till has a special interest in childhood arrhythmia and runs a clinical service for families with channelopathies. She also specialises in electrophysiology and insertion of pacemakers in children.

Dr Beverly Tsai-Goodman
Consultant paediatric and fetal cardiologist

Consultant paediatric and fetal cardiologist with main interest in detecting abnormalities of the fetal heart as early as 15–16 weeks gestation as well as managing new-born infants and children with congenital heart defects.

*To refer a patient with one of our specialists please contact our booking team at **privatepatients@rbht.nhs.uk** or call **+44 (0) 20 3553 2615.***

REVOLUTIONISING THE CARE OF HEART FAILURE

RB&HH has a long history of innovation in remote monitoring of heart failure with skilled multi-disciplinary clinical staff and several research studies in this area. An implanted device is now being rolled out as the next step in remote monitoring for this disease.

© St. Jude Medical

There is a burgeoning demand for heart failure (HF) care in the UK – the disease affects around 900,000 people in the UK alone. It is a condition that is complex and needs many components addressed to ensure the best system of care for patients is provided.

Traditionally, monitoring of patients with HF has taken place during regular clinical appointments or at a patient's request after he or she has experienced a worsening of symptoms, such as increased breathlessness or fatigue. In July 2015, for the first time in the UK a novel device that measures how well a patient's heart is functioning was implanted by cardiologists at Royal Brompton Hospital.

Several patients with chronic heart failure have now had the miniature wireless sensor inserted into their pulmonary artery (the main blood vessel carrying blood from the heart to the lungs). The device alerts doctors remotely to any decline in their condition, even before they experience symptoms.

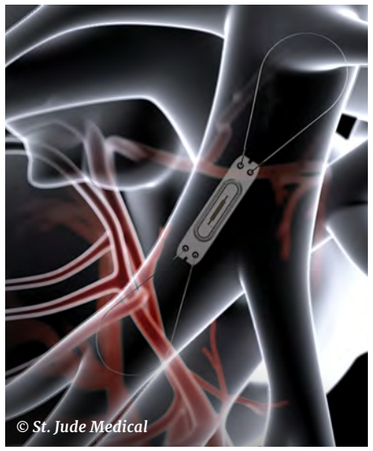
The sensor, known as the CardioMEMS™ HF System and about the size of a paperclip, is implanted during a minimally invasive procedure using a cardiac catheter passed through the vein at the top of the leg. The patient remains awake throughout the procedure which takes only half an hour. Once the device is in place, it enables remote monitoring of changes in blood pressure in the pulmonary artery which is a good indicator of worsening heart failure.

Readings are provided by a home electronics system that is simple and easy for patients to use. Each day, patients lie on a specially adapted pillow for a few minutes. The pillow receives data wirelessly from the implanted sensor and is connected to a monitor that sends the readings directly to the patient's doctors via a secure website. The HF team analyse the readings and determine if they need to adjust treatment. This is likely to be before the patient experiences any symptoms and can prevent a potentially life threatening deterioration.

Studies from the United States have shown that use of the device can reduced hospital admissions by an average of 30 per cent after six months.

Professor Martin Cowie, Consultant Cardiologist at RB&HH said:

> **The device alerts doctors remotely to any decline in their condition, even before they experience symptoms**



© St. Jude Medical

"This device has the potential to revolutionise the care of heart failure patients. By detecting any deterioration in heart function at a much earlier stage and changing treatment accordingly, we should be able to prevent significant numbers of hospital admissions and improve the quality of life for many thousands of people with the condition."

The procedure to implant the novel CardioMEMS device was carried out by leading cardiologists, Dr Mark Mason and Dr Rakesh Sharma in a cardiac catheter lab.

AT A GLANCE

WHAT IS CARDIOMEMS?

The CardioMEMSTM HF System measures and monitors the pulmonary artery (PA) pressure and heart rate in heart failure patients. An implantable sensor is permanently placed in the pulmonary artery during a right heart catheterization procedure. Together with the home electronics system the PA pressure measurements are read and automatically transmitted to the HF team who can monitor the health vital signs and make decisions about potential interventions – such as increasing medications, in real time, without the patient needing to attend a clinic.

WHO WOULD BENEFIT FROM REMOTE MONITORING?

Those patients assessed by a cardiologist and on optimal medical treatment, but still with symptoms on minor exertion.

WHAT ARE THE ADVANTAGES?

Remote monitoring provides another component of care and can help encourage patients to take a more active involvement in their health. Through the provision of regular readings the heart failure team are able to closely monitor a patient's health and provide more precise recommendations for treatment and help to decrease the chance of hospitalisation.

If you would like to find out more information on this device please contact the private patients team on +44 (0)2031 310 535 or email privatepatients@rbht.nhs.uk

CONSULTANT PROFILES

Doctor Rakesh Sharma
Consultant Cardiologist

Dr Rakesh Sharma is a Consultant Cardiologist and Clinical Lead for Heart Failure at the Royal Brompton Hospital. His clinical expertise includes the management of patients with advanced heart failure, and complex pacing, cardio-oncology and cardiac sarcoidosis.

Doctor Mark Mason
Consultant Cardiologist

Dr Mason has extensive experience in managing patients with valve disease, heart failure, and managing patients who require or already have a pacemaker or defibrillator.

Professor Martin Cowie
Consultant Cardiologist

Martin Cowie is Professor of Cardiology (Health Services Research) at Imperial College London and is an Honorary Consultant Cardiologist at RB&HH. His clinical practice focuses on heart failure, often giving second or third opinions.

CASE STUDY

DEVICE FOR LIFE

The ventricular assist device (VAD) programme at Harefield Hospital, led by Mr André Simon, director of transplantation and circulatory support, has played a pivotal role in the development of new generations of so called 'artificial hearts' and pioneered recovery therapy. Ventricular assist therapy has become clinically routine and many thousands of patients have been treated with a VAD worldwide.

Today, a significant number of patients receive a device instead of a heart transplant.

Mr André Simon, Head of Transplantation, performs an LVAD demonstration.

Mrs Jaeyda Khan, from Lahore, Pakistan, first discovered she had a weak, enlarged heart when she gave birth to her daughter in 1992. Doctors monitored her condition but it wasn't until 2014, when Mrs Khan was 42, that a pain developed in her chest and her energy levels rapidly decreased.

In May 2015, Mrs Khan flew to the UK for assessment. Her cardiologist recommended Dr Mark Mason, Consultant Cardiologist at Harefield Hospital, believing he would recommend an implantable cardioverter defibrillator (ICD device).

On examining Mrs Khan, however, Dr Mason said the ICD device could potentially worsen her condition. He referred her for assessment for the insertion of a left ventricular assist device (LVAD).

Early identification

Mr Andre Simon, Head of Transplantation and a Cardiac Surgeon at Harefield Hospital, assessed Mrs Khan. It was clear she would likely benefit from having the device.

Mr Simon says: "Identifying heart issues early on is a significant element of successful VAD procedures. Referring consultants and local specialists treating heart patients need to be able to identify the symptoms and refer at the right time to ensure successful outcomes. Knowing the VAD is an option and being able to make the referral is what makes all the difference for patients."

Today, a significant number of people receive this device instead of a heart transplant. It works well for patients unsuitable for heart transplants, perhaps because of underlying health problems or weight issues. Ventricular assist devices (VADs) can significantly increase people's quality and length of life.

> **It works well for patients unsuitable for heart transplants, perhaps because of underlying health problems or weight issues**

VADs are used as short and long-term devices, and in many instances as substitutes for heart transplants. At Harefield, we insert the device sternum sparing, which has enormous benefits for any additional surgeries.

Holistic care

Mrs Khan experienced some side effects from undergoing such complex surgery. In total she needed to be cared for by the various specialist teams at Harefield for 80 days.

After being stabilised in intensive care following her procedure, the multi-disciplinary team then focused on Mrs Khan's rehabilitation. She said: "The staff were so helpful throughout the whole procedure and recovery process."

Mrs Khan liked that a psychologist formed part of her rehabilitation, helping her learn to deal with the changes the procedure brings to her life.

The team supports patients from referral to recovery and onwards for the rest of their lives. After surgery, team members are 24-hours on call to pick up on anything before it becomes a major problem.

At Harefield Hospital, we currently operate the UK's largest ventricular assist device programme and are one of the leaders in the technology. Many Harefield patients demonstrate the highest rate of myocardial recovery in the world.

To find out more or refer a patient please contact the private patients team on +44 (0)2031 316 858 or email privatepatients@rbht.nhs.uk

AT A GLANCE

PROCEDURE
Insertion of a left ventricular assist device

CARRIED OUT BY
Mr André Simon, Head of Transplantation

Professor Ulrich A. Stock, Consultant Cardiothoracic Surgeon

HOW DOES IT WORK?
To insert the device, you attach one end of the LVAD pump to the left ventricle and the other end to the aorta. The device takes blood from the aorta and helps pump it to the body, just as a healthy heart would.

The driveline connects the LVAD, which is inside the body, through the skin to a controller outside the body. Sensing the LVAD's function, it controls the power to make it work. The controller connects to an external battery pack that patients must carry at all times.

CASE STUDY

Re-building my child's heart

18 month old Raghad from Kuwait was born with a complex and rare congenital heart defect where the heart chambers and blood vessels supplying the heart are positioned in an abnormal way.

The condition, called 'Congenitally Corrected Transposition of the Great Arteries'– or ccTGA for short – means that the arteries and the ventricles are totally inverted.

Raghad's father, Wael, recounts the day when he first found out about his daughter's condition:

"When Raghad was born, the doctors knew there was something very wrong. She had an accelerated heartbeat and she was hyperventilating. When we tried feeding her, she was unable to drink any milk… she became very weak and was always tired. She was so ill that I honestly thought she was going to die."

Raghad was admitted to intensive care and the doctors told us that she would need to have an operation to correct the position of the arteries and the ventricles."

A few days after birth, Raghad had this procedure which literally saved her life. A few months later, she had another operation to prevent too much blood from flowing to her lungs – a common consequence of having this type of heart defect. This second operation was meant to be temporary and allowed her to grow but not to live a normal life.

She needed to have a second operation called a 'double switch' which involves "switching" the ventricles and the great vessels that are abnormally inverted. There were no hospitals that performed this procedure locally and in fact, only a few centres around the world perform this complex operation.

Since Wael works for the military In Kuwait, and due to a lack of local expertise, the Kuwaiti government was able to fund Raghad's operation overseas. His doctors recommended Royal Brompton Hospital in London, as it has an international reputation for treating rare and complex forms of congenital heart disease unit is one of the largest in Europe.

> **Raghad has recovered very well and has become a completely different child – her personality is really starting to shine through**
>
> **Professor Francois Lacour-Gayet, Consultant Cardiac Surgeon**

Professor Francois Lacour-Gayet, the paediatric consultant in charge of Raghad's case comments: "Raghad came to us with a very complex heart condition. Only a handful of centres perform this type of procedure and Royal Brompton specialises in complex cases cardiac cases. During the operation, Raghad was put on a 'heart-lung machine' which takes over the function of the heart and the lungs. This allowed us to operate on the heart whilst the heart-lung machine pumps blood around the body. Once the heart was stopped, we worked to reconstruct a normal anatomy. The operation was highly complex and took over 15 hours."

Wael comments: "Since the operation, Raghad has recovered very well and has become a completely different child – her personality is really starting to shine through. No longer held back by her heart condition, she is now able to enjoy playing again and is able to eat and drink normally.

The care we received at Royal Brompton has been outstanding – from the consultants and surgeons to the staff on the paediatric ward.

The hospital has everything you need to be comfortable –particularly for those coming from overseas. There is a prayer room and Arabic interpreters, and the ward provides halal meals and Arabic newspapers.

We feel as if a burden has been lifted and are very grateful to our surgeon and the staff. We finally have peace of mind that Raghad will go on to live a fully, happy life."

To watch a video about this patient's journey, please visit: www.rbhh-specialistcare.co.uk/videos

AT A GLANCE

PROCEDURE
Double switch procedure

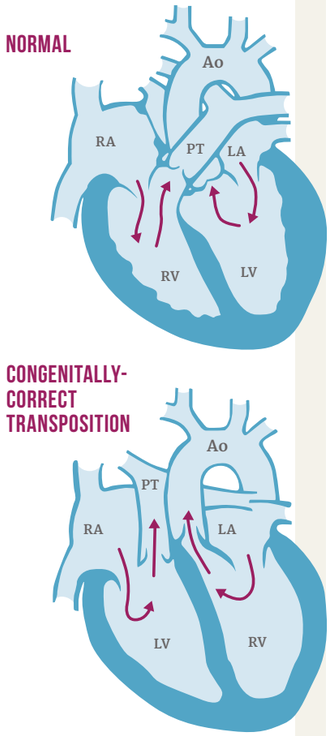
SURGEONS SPECIALISING IN THIS PROCEDURE
Mr Olivier Ghez, Consultant Paediatric Cardiac Surgeon

Mr Guido Michielon, Consultant Paediatric Cardiac Surgeon

Professor Francois Lacour-Gayet, Consultant Paediatric Cardiac Surgeon (no longer at RB&HH)

PATIENT NAME
Raghad

WHAT PROBLEMS DOES IT SOLVE?
Congenitally corrected transposition of the great arteries (CCTGA) is a rare congenital heart defect in which the heart twists abnormally during foetal development and the ventricles are reversed. Symptoms usually reflect associated cardiac anomalies. The most common presenting features are (1) bradycardia related to high-degree AV heart block; (2) a single loud second heart sound, which is often palpable to the left of the sternum, arising from the anteriorly positioned aortic valve; (3) heart murmur due to associated ventricular septal defect, pulmonic stenosis, or tricuspid regurgitation; (4) cyanosis; (5) heart failure; or (6) tachyarrhythmia.



TREATING HYPERTROPHIC CARDIOMYOPATHIES

Hypertrophic CardioMyopathy is the commonest inherited cardiac condition and associated with an increased risk of sudden death in the young. It is frequently associated with symptomatic left ventricular outflow tract obstruction.

RB&HH is one of the very few leading centres worldwide with state of the art imaging services, genetic advances and a full range of expert interventions to manage this condition.

Inherited heart muscle conditions (Cardiomyopathies)

Cardiomyopathy refers to a group of inherited diseases impacting the heart muscle and is prevalent in 1:200 in the general population. It can affect people of all ages and is a major cause of morbidity and mortality in younger ages, where other cardiac conditions are uncommon.

There are major challenges in the diagnosis, treatment and risk prevention in cardiomyopathies and the clinical expertise is concentrated in specialist centres. RB&HH is one of the very few leading centres worldwide offering the full range of expert diagnostics and interventions to manage cardiomyopathies and to lower the risk of sudden death.

Hypertrophic Cardiomyopathy (HCM)

HCM is the commonest inherited cardiac condition and is characterised by thickening of the heart muscle. Its prevalence is 1:500 in the general population and can be associated with sudden cardiac arrest. On average, 75% of HCM patients have obstruction in the outflow tract of the left ventricle. Left ventricular outflow tract obstruction (**LVOTO**) is caused by the thickened heart muscle and the abnormal movement of the mitral valve; this is the main mechanism of symptoms in HCM patients. It is also one of the risk factors for sudden cardiac death, especially in young patients.

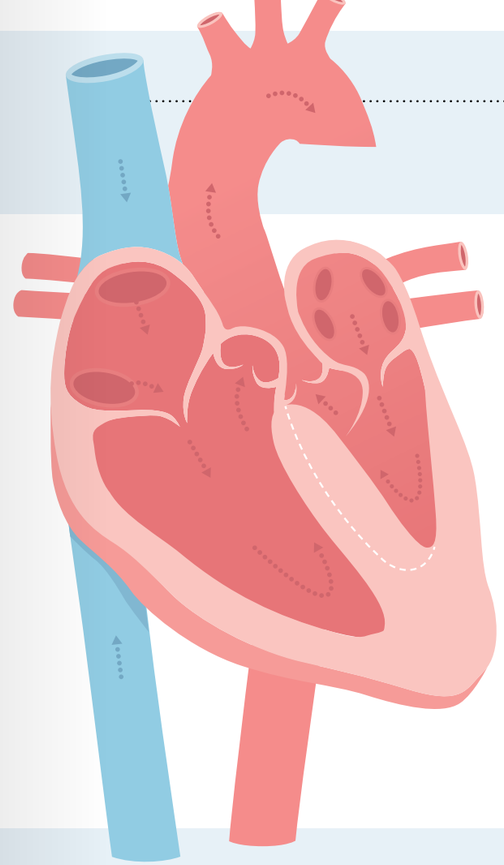
Common signs and symptoms

HCM with LVOTO can manifest itself with any of the following symptoms:

- Fatigue
- Breathlessness with activity or after lying down (or being asleep for a while)
- Lightheadedness, especially with or after activity or exercise
- Chest tightness or pain
- Fainting or near fainting, especially during or soon after exercise
- Sensation of feeling the heart beat fast or irregularly (palpitations)

Interventional techniques

Intervention is considered appropriate in patients with a significant degree of outflow obstruction, who are not improving on medication and have symptoms limiting their daily activities. The two techniques currently available are alcohol septal ablation and surgical myectomy.



During the septal myectomy procedure, the surgeon removes the small amount of the thickened septal wall to widen the outflow tract from the left ventricle to the aorta.

CONSULTANTS SPECIALISING IN LVOTO MANAGEMENT OF HCM

Dr Antonis Pantazis
Consultant Cardiologist, Programme Lead

Mr Fabio De Robertis
Adult Cardiac and Transplant Surgeon, Surgical Programme Lead

Dr Rob Smith
Consultant Interventional Cardiologist

Mr Olivier Ghez
Paediatric Cardiac Surgeon

Mr J. Andreas Hoschtitzky
Consultant Paediatric and Adult Cardiac Surgeon

Alcohol Septal Ablation

Alcohol septal ablation (**ASA**) is a non-surgical reduction of the thickness of the ventricular muscle in the area of the outflow tract, and is a clinically efficient therapeutic option in selected cases.

The procedure involves the tip of a catheter being wedged into a small artery that supplies blood to the thick muscle. Then the area of blood supply is carefully checked with specialised imaging. If appropriate, an infarction is generated in the area by injecting a small amount of ethanol through the catheter. This results in scarring and shrinking of the wall thickness reducing or even eliminating the obstruction. Nevertheless, the improvement may not manifest itself immediately after the procedure.

ASA can only address the muscle thickness and not the other components of the internal anatomy of the heart, and the amount of muscle mass reduction is also limited. In cases where a large reduction of the wall thickness would be required, it would mean inducing a large myocardial infarction that may increases the risk of the procedure.

Surgical Myectomy

Septal Myectomy entails performing surgical muscle resection (**Myectomy**) to eliminate LVOTO, and is conventionally performed through an incision made through the length of the sternum.

During the procedure the surgeon will reach the inside of the heart through the aorta and the aortic valve. The inner surface of the heart muscle will then be resected under direct vision in order to relieve the blockage in the areas where it is thickened. The amount of muscle removed varies between 3–15g and the resection is carefully planned and carried out taking into account all the individual anatomical characteristics of the patient's heart.

Even when anatomically normal, the mitral valve contributes to the obstruction and it may hence lose its normal function resulting in leaking blood from the ventricle back to the left atrium. Mitral regurgitation leads to enlargement of the left atrium and may also lead to atrial fibrillation (**AF**). Most commonly the mitral regurgitation is dynamic and releasing the obstruction in the LVOT will also decrease the amount of regurgitation.

Following uncomplicated surgery a patient can be discharged from hospital within 7 days. The relief from obstructive symptoms is rapid but the recovery from the operation may take a while.

The benefits of successful LVOTO management

Patients experience major symptomatic improvement after successful management of LVOTO and data suggest that significant reduction or elimination of LVOTO improves survival and long-term outcome. Longitudinal studies show sustained clinical improvement with 85–90% of patients remaining asymptomatic (or only mildly symptomatic), at an average of 8 years (and up to 25 years) after a myectomy.

To find out more or refer a patient please contact the private patients team on +44 (0)2031 316 858 or email privatepatients@rbht.nhs.uk

World-Class International Patient Service

Our International team provide world-class care to patients from across the globe.

Our expertly trained team understand that visiting the hospital can be a worrying time, and can be especially stressful for those traveling from overseas. This is why we work with patients and their families to tailor their care and try and make their stay as comfortable as possible.

Overseas private patients can be confident they will receive first class, round-the-clock care and treatment.

Personalised in-patient stay

The team strive to provide personalised care designed to ensure our patients have a comfortable stay. All in-patient care is provided in private wings within the main hospital buildings, 24 hours a day, seven days a week. Our in-patients benefit from comfortable single occupancy rooms with en-suite bathrooms.

International concierge and interpreter services

Our dedicated team of international liaison officers provide bespoke services that take into account the patient's cultural, religious and language needs. Specially trained they can help by advising the most appropriate specialists and making arrangements to take the patient from and to the airport.

The team can also arrange appointments, admission to the hospital and can help with financial matters, through liaison with embassies, international insurance companies and other organisations.

To help patients focus on their health, our liaison officers will ensure the patient's family receives information and support. Fluent in Arabic, the officers will answer questions and support the patient and their family. The officers are available on site Monday to Friday and on call 24 hours a day, seven days a week.

We can also provide medically trained interpreters for a range of languages including Polish, Punjabi, Spanish, Turkish, Tamil and Urdu. In addition, many of our doctors and nurses speak languages other than English.

Multi-faith prayer room, chapel and religious representatives

We understand that though in a foreign country you will continue with your cultural and religious and spiritual practices. At our hospitals we provide a number of facilities and contacts to support our patients religious needs.

Our multi-faith rooms at Royal Brompton and Harefield Hospitals allows people of all religions and backgrounds a private and quiet place to pray or contemplate. The room is equipped with a variety of religious/spiritual texts, a male/female room divider (if required), prayer mats and a wash basin.

In addition, Royal Brompton Hospital also provides a Christian Chapel which provides a quite and tranquil space, away from the wards, for use by all.

Our chaplaincy service will support patients, their relatives and friends by providing someone who can listen in confidentiality and provide support and information.

We offer a number of on-site religious representatives which can also be contacted out of normal working hours to meet your individual needs. To make use of this service, simply ask one of the customer service team or your nurse.

Bespoke meals, international newspapers and TV channels

At Royal Brompton and Harefield Hospitals, we have a dedicated catering service with meals freshly prepared on site. We cater for a variety of special diets and cuisines including Halal and Kosher. Our meal options also include meals suitable for diabetic, weight reducing, healthy eating and vegetarian. We are pleased to cater to particular requests whenever possible.

In order to make your stay as comfortable as possible, we provide televisions in our private rooms, screening both domestic and international channels. A selection of international newspapers are also available upon request.

For more information or to speak to our dedicated international team please call+44 (0)2031 310 535 or email privatepatients@rbht.nhs.uk

What's New

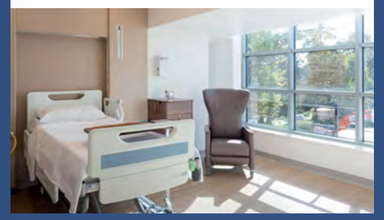
You can keep up to date with all our latest news by following our social media pages on Facebook, Twitter, Instagram and LinkedIn.

RB&HH Facebook
20 October

New ward at Harefield Hospital

This autumn we are excited to be expanding our facilities at Harefield Hospital to include a brand new state-of-the-art private ward. #healthcare #london

Read more on



RB&HH Instagram
17 November

Groundbreaking Ozaki procedure

Heart tissue from an animal is used to reconstruct a damaged aortic valve instead of replacing it entirely with a prosthetic implant. #heartdisease #innovation

Read more on

For regular updates follow us on our social media pages. You can find us here:

- @RBHHPrivateCare
- @RBHHSpecialistCare
- @RBHHprivatecare
- Royal Brompton and Harefield Specialist Care

RB&HH Linkedin
15 November

World leading UK lung cancer surgeon presents at Arab Health 2018

This year, world leading Consultant Thoracic Surgeon Ms Emma Beddow, has been asked to present at the Arab Health congress to highlight how she is pushing boundaries to find cures for patients. #RBandH

Read more on

RB&HH Twitter
21 November

Septal Myectomy: A Patient's Perspective

The faulty gene can be inherited from either parent, and relatives may have similar heart problems and symptoms. Even in the absence of symptoms, affected people may have a risk of complications and need to be screen preventatively #health

Read more on

RB&HH Twitter
24 October

Hope in the fight against lung cancer

Harefield Hospital's Dr Paras Dalal is finding great success in the treatment of lung cancer with percutaneous tumour ablation. #breakthrough #health

Read more on

Royal Brompton Hospital
Sydney Street
London SW3 6NP
Tel: +44(0)20 3131 0535
Fax: +44(0)20 7351 8535

Harefield Hospital
Hill End Road
Harefield UB9 6JH
Tel: +44(0)20 3131 6858
Fax: +44(0)20 7351 8535

RB&HH Specialist Care
Outpatients and Diagnostics
77 Wimpole Street
London W1G 9RU
Tel: +44(0)20 3131 0535
Fax: +44(0)20 7351 8535

www.rbhh-specialistcare.co.uk

RB&HH
SPECIALIST CARE