

Case Notes

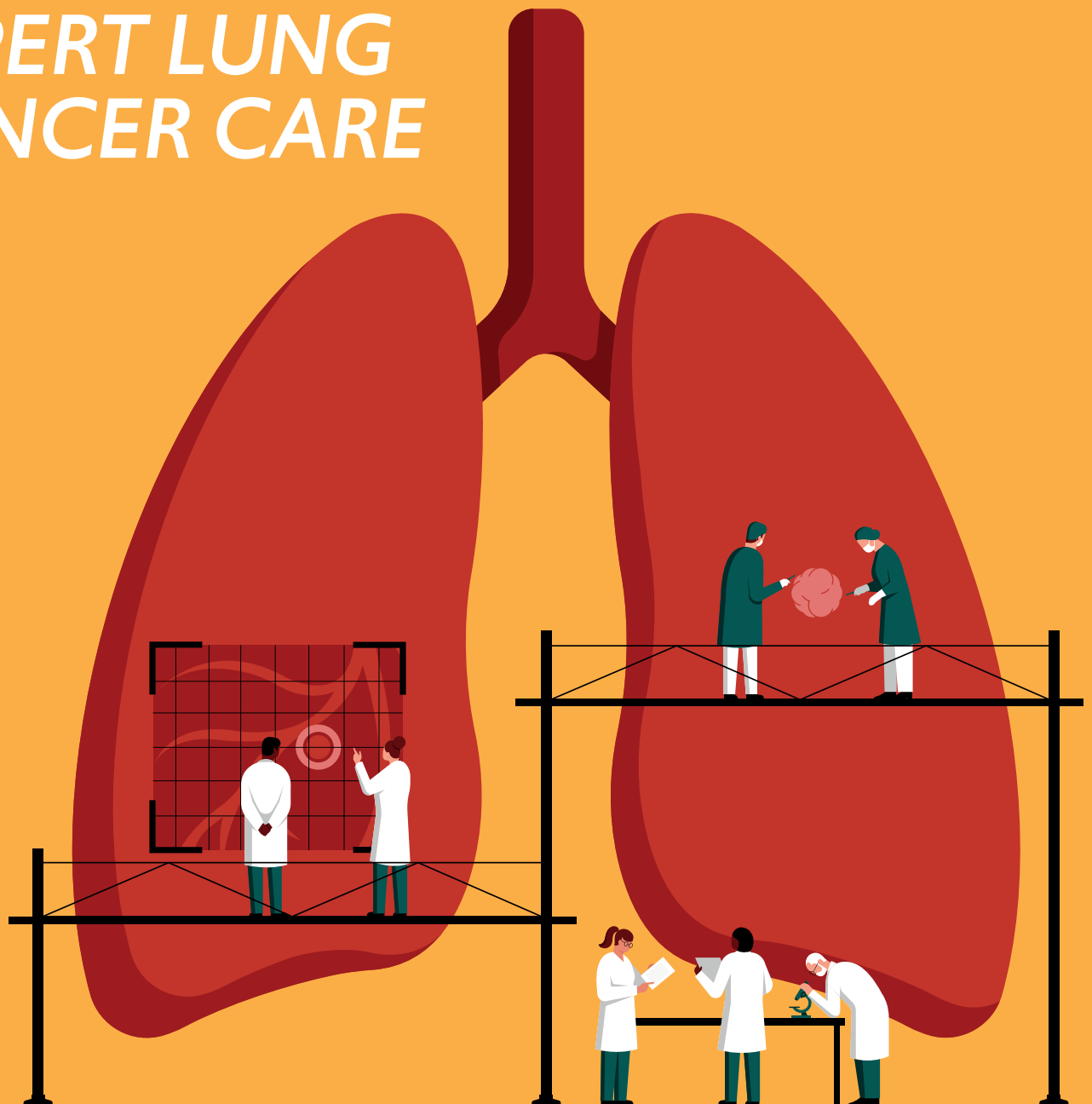
Royal Brompton & Harefield Hospitals Specialist Care

RAPID TREATMENT FOR
HIGH-RISK PULMONARY EMBOLISM

IMPROVING CARE FOR
CONGENITAL HEART DISEASE

AORTIC VALVE REPLACEMENT
IN YOUNG ADULTS

EXPERT LUNG CANCER CARE





An update from David Shrimpton

The last few months of 2021 were full of achievements.

Our healthcare professional education platform, RB&HH Education, hit a milestone of 60 online talks from our world-leading consultants on topics such as managing asthma in children and treating heart disease in women.

We also recently had the pleasure of being invited to Cairo, Egypt, to officially sign our partnership with

Ain Shams University Hospital. This collaboration will enable experts from Royal Brompton and Harefield hospitals to support the cardiac surgery team at Ain Shams in strengthening its aortic surgery services.

Finally, our hospitals were ranked once more as some of the world's top centres for cardiology care by US Newsweek, which you can read more about on page 2.

David Shrimpton

Managing director,
RB&HH Specialist Care



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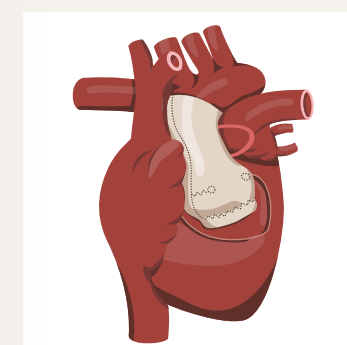
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Improving care for
congenital heart disease



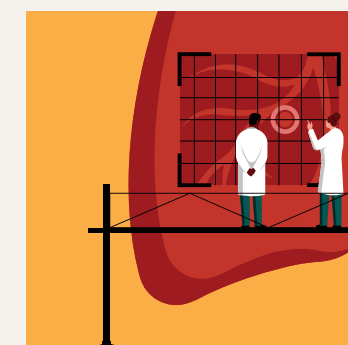
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Aortic valve replacement
in young adults



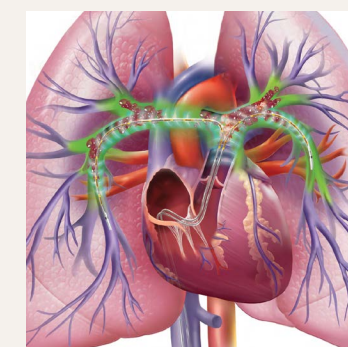
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Social News update

What's new?

ROYAL BROMPTON CLINICIAN RECEIVES PRESTIGIOUS ACCOLADE

Royal Brompton consultant cardiologist and intensivist, Professor Susanna Price, has been awarded Honorary Membership of the European Society of Intensive Care Medicine (ESICM).

The highly prestigious award is given to individuals who have made exceptional contributions to both the ESICM and the speciality of intensive care medicine over a prolonged period. The award is given to between only one to four intensivists across the world each year.

Commenting on Professor Price's award, Professor Lui Forni, ESICM Secretary said: *"Susanna often attributes all of her achievements to those who trained her, and seems at times, blinkered to her own abilities. All I can say is that in the future I am sure that she will be recognised as one of the giants of her field from whose shoulders others will see further."*



| Professor Susanna Price, consultant cardiologist and intensivist

OUR HOSPITALS RANKED IN THE TOP 120 CENTRES IN THE WORLD FOR CARDIOLOGY CARE

Royal Brompton Hospital, St Thomas' Hospital cardiology department and Harefield Hospital have been identified as three of the best centres in the world for cardiology care by the American weekly news magazine, Newsweek.

The 'World's Best Specialized Hospitals 2022' identifies and honours the very best hospitals through a global survey of medical professionals.

Royal Brompton Hospital was ranked ninth in the cardiology category – the only UK hospital to appear in the list's top 70 and ranking one place higher than last year, and was also ranked eight for pulmonology. St Thomas' Hospital cardiology department ranked at number 75, and Harefield Hospital at number 119.

Our hospitals ranked in the
Top 120 Centres
in the world for cardiology



| Julia Gangata, Harefield Hospital cath lab sister

HAREFIELD HOSPITAL NURSE WINS RISING STAR AWARD

Julia Gangata, Harefield cath lab sister, has been announced as one of the winners of the Royal College of Nursing (RCN) London's Rising Star Awards 2021. The awards were part of RCN London's celebrations for Black History Month, with 14 winners from hospitals across the capital.

The Rising Star Awards recognise nurses and healthcare support workers from London's Black, Asian, and Minority Ethnic (BAME) nursing community who have made an outstanding contribution to the capital's health and care system.

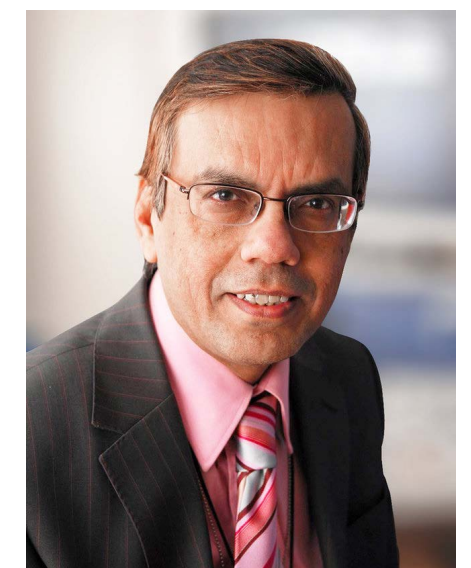
Julia was nominated by Harefield cath lab manager, Sumesh Thiruthalil, due to her extraordinary devotion throughout the Covid-19 pandemic and beyond. Sumesh said: *"Julia is an amazing individual who is always very approachable. I am overjoyed to have her as a member of our department."*

AWARD FOR SURGERY

Royal Brompton Hospital consultant cardiologist, Professor Roxy Senior, has been selected as an Honorary Fellow of the American Society of Echocardiography.

His Honorary Fellowship is presented to echocardiographers outside the United States who have made a significant contribution to the field of cardiovascular ultrasound imaging, inspiring clinicians through their research and leadership.

Professor Senior said: *"I am very happy and proud to be recognised by the American Society of Echocardiography. Echocardiography is a marvellous tool for clinicians, allowing us to see what the heart it is doing in real time through a non-invasive procedure, helping us to diagnose heart disease."*



| Professor Roxy Senior, Consultant cardiologist, Professor of clinical cardiology, National Heart and Lung Institute, Imperial College London

OUR NEW CONSULTANTS

As one of Europe's largest heart and lung centres, we attract some of the most talented consultants from all over the world. Below are some of the newest members of our team.



Professor Gisli Jenkins, Consultant respiratory physician – Royal Brompton Hospital

Professor Gisli Jenkins is a respiratory physician with 20 years' experience managing interstitial lung diseases as well as a scientist studying how the lung responds to injury to understand what drives progressive pulmonary fibrosis, repair and regeneration. Professor Jenkins clinical and research focus is on interstitial lung disease and pulmonary fibrosis in particular, and the three major themes of his research include the genetic risk factors for the development of pulmonary fibrosis, pulmonary fibrosis development or progression prevention and the assessment of patient cohorts with fibrotic disease or potentially fibrotic disease.



Dr Aditi Desai, Dental surgeon and sleep specialist – Wimpole Street

Dr Aditi Desai is a sleep medicine dentist and has been a restorative dentist for over 44 years. She now focuses her practice on the management of patients with sleep disorders that require dental management.

Dr Desai specialises in snoring, upper airway resistance syndrome, obstructive sleep apnoea, sleep bruxism, temporomandibular disorders and orofacial pain. She works as part of a multidisciplinary team with sleep specialists to offer holistic treatment for her patients. Dr Desai is also the current President of the British Society of Dental Sleep Medicine, as well as President of the British Academy of Dental Sleep Medicine.



Dr Carole Ridge, Consultant cardiothoracic and interventional radiologist – Royal Brompton Hospital

Dr Carole Ridge is a consultant cardiothoracic and interventional radiologist who specialises in lung tumour ablation, cardiac imaging and quantitative imaging of the lungs.

Dr Ridge has particular interests in lung tumour ablation, cardiac imaging and quantitative imaging of the lungs. Her specialist expertise is in cardiac computerised tomography (CT), dual-energy CT pulmonary angiography of the lungs and microwave ablation of lung tumours. She also has expertise in arterial embolisation, vascular ultrasound and oncologic MRI.



Dr Gherardo Finocchiaro, Consultant cardiologist – Royal Brompton Hospital, Wimpole Street

Dr Gherardo Finocchiaro is a consultant cardiologist at Royal Brompton and Harefield Hospital and an honorary senior lecturer at St George's University of London.

Dr Gherardo Finocchiaro deals with many aspects of cardiology, including hypertension, heart failure, possible coronary artery disease and valvular heart disease. He has specialist interest and expertise in heart muscle diseases – which often have a genetic basis such as arrhythmogenic cardiomyopathy, dilated cardiomyopathy and hypertrophic cardiomyopathy.



Professor Suveer Singh, Consultant in respiratory medicine – Royal Brompton Hospital

Professor Suveer Singh is a consultant in respiratory and critical care medicine at Royal Brompton Hospital.

He has over 20 years of experience in respiratory medicine, sleep and intensive care with expertise in severe acute respiratory failure, ECMO, ventilation and acute respiratory infection.

Professor Singh is an active clinical researcher with an interest in early diagnostic markers in pulmonary infection and sepsis (inhale, inhale-covid), weaning from ECMO, ARDS follow up and bronchoscopic lung volume reduction studies.

Research update

HAREFIELD HOSPITAL RECRUITS FIRST UK PATIENT TO INTERNATIONAL PAEDIATRIC DRUG TRIAL

Researchers at Harefield Hospital have successfully recruited the first UK patient for a study looking into the effects of a cholesterol-lowering drug in children and young people with heterozygous familial hypercholesterolemia (HeFH).

Led by Professor Mahmoud Barbir, consultant cardiologist, the ORION-16 trial will study the effect of the drug inclisiran, in children and young people with HeFH, to determine the safety of the drug and whether it will lower LDL-cholesterol.

Sponsored by Novartis, the trial is being conducted in 26 countries. In the UK there are two centres participating, but it is at Harefield Hospital where the first UK participant has been recruited and successfully randomised.

Professor Barbir highlights the importance of this trial for patients with HeFH:

"Hypercholesterolaemia is a leading cause of cardiovascular morbidity and mortality."

"Many children with heterozygous FH do not achieve appropriate low-density lipoprotein (LDL) cholesterol goals in spite of treatment with statins. The study drug is a novel agent for lowering the Apolipoprotein B - containing lipoproteins. This has the potential to further advance the lipid lowering treatment options for paediatric patients with familial hypercholesterolaemia and aims to prevent atherosclerotic cardiovascular disease in children with HeFH."



| Professor Mahmoud Barbir

RESEARCHERS TO USE PATIENTS OWN IMMUNE CELLS TO COMBAT LUNG TRANSPLANT REJECTION

Could the use of patients own 'treated' immune cells help prevent lung transplant rejection?

That's what researchers will attempt to find out thanks to £1.86m in funding from the National Institute for Health Research's (NIHR) through its Efficacy and Mechanism Evaluation (EME) programme.

The multi-centre trial, led nationally by Professor Andrew Fisher at Newcastle Upon Tyne Hospitals NHS Foundation Trust, will be carried out at five centres cross the UK, including at Harefield Hospital where it will be led by Dr Martin Carby, respiratory consultant.

Lung transplants are sometimes the only option for patients with severe chronic lung diseases who are no longer responding to other methods of treatment.

Lung transplant surgery is complex and carries a high risk of complications. One complication is the patient's own immune system rejecting the donated lungs, leading to Chronic lung allograft dysfunction (CLAD).

One potential treatment is Extracorporeal Photopheresis (ECP) therapy, which makes use of the patients own immune cells.

ECP involves using the immune cells isolated from a patient's blood and combining it with a photoactive drug. The cells are then exposed to ultraviolet light which 'activate' the drug before being reintroduced into the patient.

Previous small studies into ECP have shown that these treated immune cells slow down the progression of CLAD in some patients. However, more robust evidence is needed to determine if it works, exactly how it works and in which patients.

Dr Carby said: *"This is an exciting opportunity to collaborate with other UK centres and try to refine the use of ECP moving forward."*

"It will help us to answer important questions about who may respond and who may not and to identify how ECP has an effect and therefore to be able to measure that effect."

"This will help us tailor treatment better to individuals and increase our confidence that this is the best rescue treatment for those patients whose lung function deteriorates despite best first line treatment."



| Dr Martin Carby

Improving care for Congenital heart disease

Congenital heart disease is one of the most common birth defects and requires life-long monitoring and care. Our specialists have developed a new one-stop same-day service that has the potential to greatly improve the quality of care for all patients with this condition.

A LIFE-LONG HEART PROBLEM

Congenital heart disease is a term that covers a range of birth defects that disrupt the normal function of the heart and affect up to 1% of new-borns worldwide.

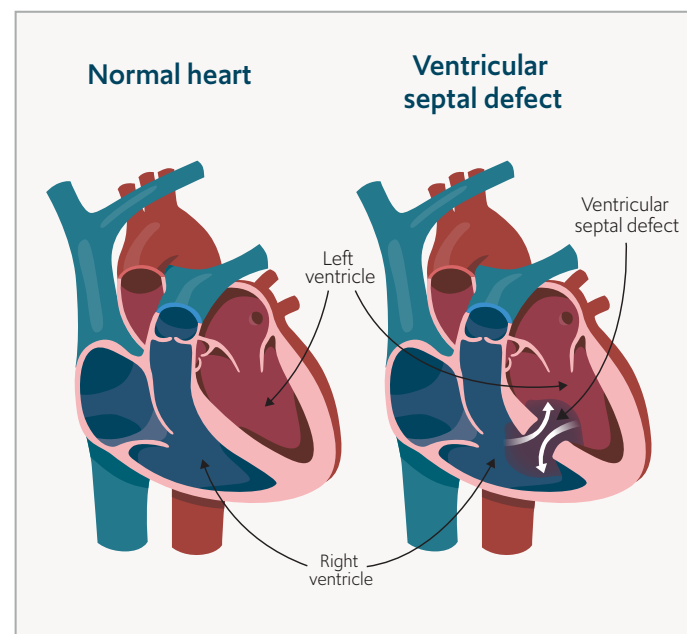
There is no obvious cause of congenital heart disease identified in most cases, but some things are known to increase the risk. This includes genetic disorders such as Down's syndrome, smoking or drinking alcohol during pregnancy, or having poorly controlled type 1 or type 2 diabetes during pregnancy.

Symptoms in babies and children can include a rapid heartbeat and/or breathing, extreme fatigue and a blue tinge to the skin caused by low blood oxygen levels. However, depending on the heart defect, symptoms might not appear until later in life.

There are many different types of congenital heart disease and they can sometimes occur in combination. Some more common defects include a hole between chambers of the heart as well as the main blood vessels of the heart being narrower than normal, making it hard to pump blood around the body.

Congenital heart disease is usually diagnosed during pregnancy with routine scans. However, depending on the type, it may sometimes be diagnosed only after birth or years later in childhood.

Treatment depends on the type of defect and can include surgery to restore the heart's normal function. However, people with congenital heart disease often need treatment and monitoring throughout their life as they can experience further problems with their heart rhythm or valves over time.



A 'ventricular septal defect' is an example of congenital heart disease, where the hole appears between the lower chambers of the heart called ventricles. This causes blood to be pumped into the lungs rather than the rest of the body as it normally should.

Thankfully, with advances in medicine, survival of patients with the condition is expected into adulthood for the vast majority in developed countries. For this reason, specialist hospitals throughout the UK offer treatment and monitoring clinics for adults with congenital heart disease.

A PATIENT-CENTRIC SERVICE IS NEEDED

As adult congenital heart disease clinics need to cover a broad spectrum of heart defects, care pathways can be complicated for patients to navigate.

Patients require a range of regular tests as part of monitoring their condition, including MRI and CT scans of their hearts, as well as blood tests and an ECG to check their heart rhythm. However, due to the way NHS trusts are organised, these testing services are managed independently of one of another and can be arranged months apart at inconvenient times of the day.

In addition, due to the delay between monitoring tests, the care of the same patient can be reviewed at multi-disciplinary consultant meetings repeatedly with diagnostic information missing each time as tests are yet to be completed.

In combination, this results in inefficiency and delays in care, as well as greatly reducing the quality of life of patients who remain without answers on their condition for far longer than they have to.

CREATING A NEW NHS SERVICE WITH PATIENTS AT ITS HEART

Professor Michael Gatzoulis, consultant cardiologist and clinical and academic lead for adult congenital heart disease services at Royal Brompton and Harefield hospitals, felt there was a better way of providing care for these patients. In May 2020, in the midst of the COVID-19 pandemic, he led a trial to see if a one-stop same-day adult congenital heart disease service could be delivered within the NHS.

“Our patients are already burdened with a heart condition from birth and the way we currently deliver care within the NHS just adds to their burden. It shouldn't be this way.”

“Patients deserve to have a personalised health service designed around them, that delivers quick results and requires as few visits to a hospital as possible,” says Professor Gatzoulis.

The pilot trial, which ran over three months and involved 51 patient volunteers, was delivered in partnership with our hospital's private patient services unit at 77 Wimpole Street where the framework for a one-stop same-day service already existed – unlike that of our NHS services.

The new service combined all the routine diagnostic investigations needed (cardiac MRI, echocardiogram, ECG, chest X-ray and comprehensive suite of blood tests), reporting and evaluation with a specialist cardiology consultant, and a session with a clinical nurse specialist on personalised education and lifestyle advice – all delivered in one day and location.

EXPANDING ACCESS TO IMPROVED NHS CARE DELIVERY



Professor Michael Gatzoulis (left) with the private patient team at 77 Wimpole Street which helped implement the pilot one-stop same-day adult congenital heart disease service.

The pilot was a success with all patients receiving their monitoring tests and follow-up with a consultant and specialist nurse on the same day for instant results and details of next steps in their care.

One patient from the trial commented: *“We live in Sussex and to have separate appointments for every investigation was much more inconvenient, as well as being spread over months which causes more stress while you wait for the final consultation to tell you the results or diagnosis. This day assessment addressed every single one of those issues in one visit for us.”*

Professor Gatzoulis added: *“We are very pleased to say that following the success of the pilot, the service is now being implemented for NHS adult congenital heart disease patients at our hospitals and we have invested in a new imaging centre to accommodate and facilitate this vision. We hope that more NHS trusts will follow our new framework of care with time. The partnership with our private patient services was the first of its kind for our team and enabled us to continue researching ways to improve patient care even during the challenging conditions of the pandemic.”*



Professor Michael Gatzoulis
Consultant cardiologist

Clinical and academic lead for adult congenital heart disease. Specialises in adult congenital heart disease, heart valve disease, heart disease in pregnancy and pulmonary hypertension.

To find out more about our congenital heart disease services, please contact the customer services team on **+44 (0)20 3131 0535** or email **privatepatients@rbht.nhs.uk**

AORTIC VALVE REPLACEMENT

IN YOUNG ADULTS

The choice of aortic valve replacement procedure in young and middle-aged adult patients is challenging. It needs to provide durable haemodynamic properties that enable an active lifestyle desired by this age group, while avoiding valve-related reoperation for as long as possible to maintain an excellent quality of life.

Mechanical valves are very durable and most frequently implanted in this age group, but require lifelong anticoagulation that exposes patients to haemorrhagic and thromboembolic complications. A biological valve is the most suitable for younger patients, particularly under 30, as they do not require anticoagulation. However, both bioprosthetic valves from animals and aortic valve homografts deteriorate at a high rate and require reoperation within a few years.

Trials have demonstrated favourable results for the Ross procedure in delivering a durable biological valve replacement with haemodynamic properties that are ideal for this patient population without the need for anticoagulation and our experts are currently trialling it in combination with the PEARS procedure to increase its durability even further.

AORTIC VALVE REPLACEMENT IN YOUNGER PATIENTS

Aortic valve replacement is the most common form of heart valve surgery. It is used to correct aortic valve disease, the most common of which are aortic stenosis and aortic regurgitation. Although age is a risk factor for both these conditions, they can be congenital in nature and so affect younger patients.

Replacement options include mechanical valves, bioprosthetic valves, aortic valve homografts and the Ross procedure. However, there is currently no clear guidance on the best option and the choice of aortic valve replacement has important implications for long-term outcomes.

In older patients over 60, the choice of aortic valve replacement is straightforward, as there is no survival advantage between bioprosthetic or mechanical valve at this age. However, in young and middle-aged adult patients that require aortic valve replacement, the choice is more challenging.

Due to a longer life expectancy, these younger patients are exposed to higher cumulative risks of valve-related complications. They are also more likely to want to pursue higher levels of physical activity after an operation than older patients and, for women of childbearing age, may be contemplating pregnancy.

An ideal aortic valve replacement for young and middle-aged adult patients will therefore need to minimise valve-related complications and provide durable haemodynamic properties that allow patients to lead an active lifestyle with an excellent quality of life.

Mechanical valves are the most frequently implanted in young and middle-aged adult patients primarily due to the ease with which they can be implanted and their durability. However, as they are thrombogenic, they require lifelong anticoagulation and expose patients to a continuous hazard of haemorrhagic and thromboembolic complications.

The management of anticoagulants can be particularly problematic during pregnancy, where they can pose a significant risk to both mother and foetus. The risk of thromboembolic events with mechanical valves is also significantly increased with pregnancy.

Biological valves are the most suitable for younger patients, particularly those under 30, as they do not require anticoagulation. However, both bioprosthetic valves and aortic valve homografts are associated with predictable higher rates of valve deterioration and need for reoperation when implanted in young adults. Bioprosthetic valves also have the potential for accelerated degeneration with pregnancy.

The Ross procedure may offer an alternative, more favourable option for biological aortic valve replacement in young and middle-aged adults.

THE ROSS PROCEDURE: A FAVOURABLE APPROACH FOR YOUNGER ADULT PATIENTS

The Ross procedure utilises the anatomic similarity between the aortic and pulmonary valves. The diseased aortic valve is first removed and replaced with the patient's own healthy pulmonary valve as an autograft. The patient's pulmonary valve is then replaced with a cryopreserved donor valve as a homograft.

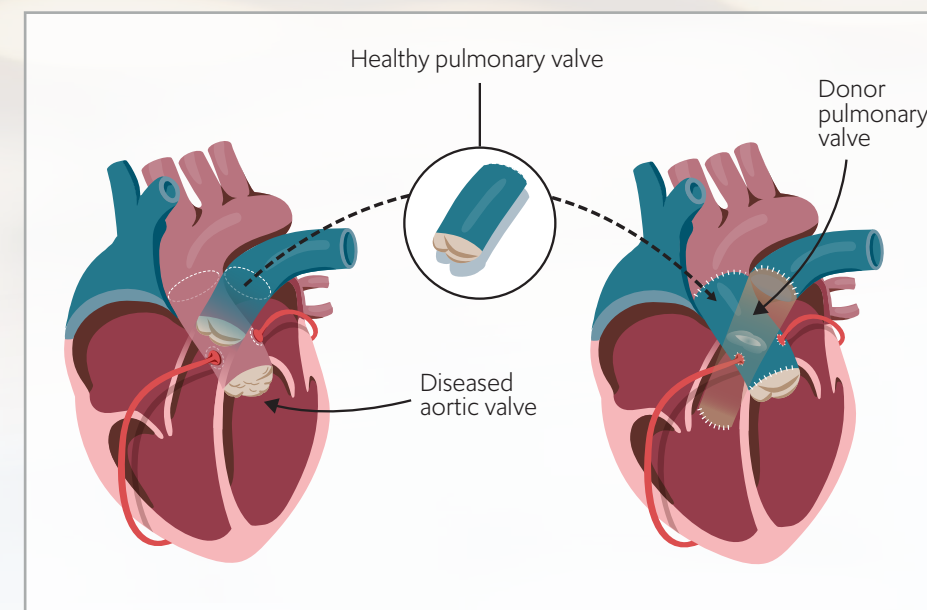
The pulmonary valve autograft undergoes adaptive remodelling enabling it to mimic the function and highly sophisticated anatomy of the native aortic root. This translates to better long-term clinical outcomes than all other aortic valve substitutes, including aortic valve homografts which become acellular a few weeks after implantation.

Studies have shown that haemodynamic performance in patients undergoing the Ross procedure closely mirrors that of native aortic valves in healthy individuals during maximal exercise performance. As human valves are used, patients also do not require anticoagulation. Due to both factors, patients experience an enhanced quality of life when compared to mechanical aortic valve replacement.

A recent long-term study of the outcomes of the Ross procedure on 414 patients over 18 years demonstrated an excellent long-term survival rate of 89.3% at 15 years, which was similar to a normal age- and sex-matched population. There was also a low incidence of reoperations.

A separate study compared the cost-effectiveness of the Ross procedure with bioprosthetic and mechanical valves in young and middle-aged adults. It demonstrated that the Ross procedure was more economically efficient in the longer term with a lifetime incremental net monetary benefit of £60,952.

Due to the complexity of the Ross procedure, it is most safely performed at experienced, high volume centres where operative mortality is comparable to that of conventional prosthetic aortic valve replacements. Our specialist hospitals have been performing the Ross procedure for over 30 years with favourable results.



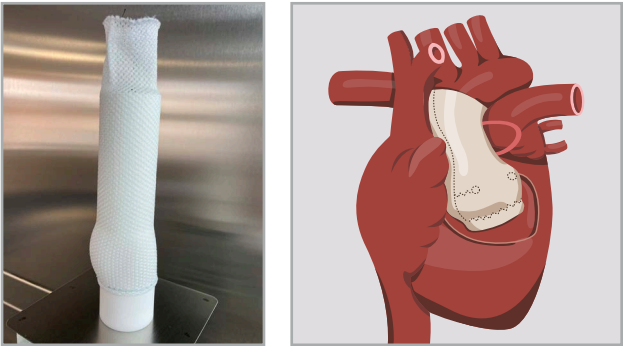
The Ross procedure: The diseased aortic valve is removed and replaced with the patient's own healthy pulmonary valve. The patient's pulmonary valve is replaced with a cryopreserved donor pulmonary valve.

ENHANCING THE ROSS PROCEDURE WITH PEARS

Although excellent long-term results have been demonstrated with the Ross procedure, the pulmonary valve autograft can require reoperation 15 years later in approximately 10% of patients. This may occur due to progressive aortic root dilation or anatomic mismatch between the original diseased aortic valve and pulmonary valve autograft, which can lead to damage over time.

Aortic root reinforcement during the Ross procedure has been trialled and has shown to reduce the need for reoperation for pulmonary valve autograft failure. Aortic root reinforcement may therefore be performed prophylactically to prevent aortic dilation or therapeutically to correct anatomical mismatch.

Personalised external aortic root support (PEARS) is a relatively new aortic root reinforcement system. Originally developed at our hospitals for patients with Marfan syndrome – where patients experience aortic dilation at a young age, a synthetic ExoVasc polymer mesh sleeve is used to support the aorta and prevent it from expanding.



The PEARS procedure: (L) the ExoVasc mesh support formed on an anatomically precise model of the patient's aorta and (R) a visual of the mesh support in situ implanted around the patient's aortic root.

The ExoVasc mesh support utilises advanced medical imaging and computer-assisted 3D printing to create a precise model of the patient's aorta and aortic valve that is personalised to the unique anatomy of the patient. This model is then used to form the textile ExoVasc implant. The ExoVasc textile implant created has 0.7mm pores which enable the patient's cells to enter and adhere it firmly to the patient's tissues for greater long-term durability.

A recent multi-centre, prospective cohort study on 117 patients receiving the PEARS procedure for a dilated aortic root (without the Ross procedure) demonstrated a low risk of death and requirement for re-operation after a minimum of one-year follow-up.

“The PEARS procedure has been successfully performed on over four hundred patients with Marfan syndrome worldwide. However, its use in the Ross operation is fairly new,” explains our consultant cardiac surgeon, Professor John Pepper, who pioneered the PEARS procedure at Royal Brompton Hospital and advises our consultants on this and the Ross procedure.

“By adding aortic root reinforcement with PEARS to the Ross procedure, we hope to reduce the number of patients requiring reoperation on the pulmonary valve autograft. For young and middle-aged adult patients, we want to make sure that any treatment offered enables them to live for as many years without re-intervention as possible, with an excellent quality of life.”

In the Ross-PEARS procedure, it is the pulmonary valve autograft that is modelled and an ExoVasc implant produced to support it when it is re-implanted to replace the aortic valve.

Our consultants are leading experts in both the Ross and PEARS procedure, with over 40 combined Ross-PEARS procedures performed so far across our hospitals. Our consultant cardiac surgeons, Mr Jullien Gaer, Mr J Andreas Hoschitzky, Mr Mario Petrou and Professor Darryl Shore all perform the Ross and PEARS procedures, as well as the combined Ross-PEARS procedure at our centre.

Mr Conal Austin, consultant cardiothoracic surgeon at Guy's and St Thomas' NHS Foundation Trust – which we have recently merged with, also performs the Ross, PEARS and combined Ross-PEARS procedure, but does not currently operate at Royal Brompton and Harefield hospitals.



Professor John Pepper
Consultant cardiac surgeon

Professor Pepper specialises in surgery to treat diseases of the aortic valve and thoracic aorta. He pioneered the PEARS procedure for the treatment of aortic dilation and continues to research heart treatments for patients with Marfan syndrome.



Mr Jullien Gaer
Consultant cardiac surgeon

Mr Gaer specialises in adult cardiac surgery including coronary artery bypass surgery and treating the aortic valve, root or arch. He has published extensively on aortic surgery and is regularly invited to speak at international events to share his knowledge.



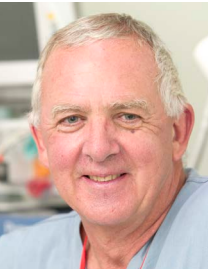
Mr J. Andreas Hoschitzky
Consultant paediatric and adult cardiac surgeon

Mr J. Andreas Hoschitzky specialises in correcting complex congenital heart defects, including valve repair and aortic root surgery. He is actively involved in researching the long-term outcomes of surgery for patients with congenital heart defects.



Mr Mario Petrou
Consultant cardiac surgeon,
Co-lead for cross-site cardiac surgery

Mr Mario Petrou is a consultant cardiac surgeon who specialises in cardiac surgery, especially mitral repair and aortic surgery, both simple and complex. He has published over 80 peer-reviewed journal papers and other publications in his field of work.



Professor Darryl Shore
Consultant cardiac surgeon

Professor Shore specialises in the surgical management of adults with congenital, valvular or coronary heart disease. He has published many papers on congenital heart surgery and is internationally recognised in this field of medicine.

To find out more about the Ross, PEARS and Ross-PEARS procedures, please contact our customer services team on **+44 (0)20 3131 0535** or email **privatepatients@rbht.nhs.uk**

EXPERT LUNG CANCER CARE

Management of lung cancer can be complex when most commonly diagnosed in the advanced stages. Our team of specialists can help screen and detect lung cancer in its earliest stages for a better chance of treatment success and offer various minimally invasive procedures to remove and control the spread of the disease.



Professor Eric Lim,
our consultant
thoracic surgeon
and a specialist in
minimally invasive
procedures for lung
and chest cancers

LUNG CANCER:
THE GLOBAL BURDEN

Most deaths caused by cancer worldwide are due to that of the lung. It is responsible for almost 1 in 4 (1.6 million) cancer-related deaths each year – this is more than colon, prostate and breast cancer combined.



Air pollution, such as that caused by exhaust fumes from diesel cars, can increase the risk of lung cancer.

It is well known that most cases of lung cancer are due to smoking, but there is evidence that small dust-like particles in air pollution are also linked. It is not fully understood how these particles can damage DNA in cells to cause cancer, but the smallest particles known as PM10 and PM2.5 are known to be associated.

Workplace exposures may also contribute to an increased risk. These include exposure to asbestos during building work; silica during glass making or bricklaying; and regular exposure to diesel exhaust fumes – such as that experienced by professional drivers and mechanics.

Lung cancer increases with age and disease rates increasing sharply after 45. Symptoms of lung cancer are often non-specific and can include a persistent cough and/or breathlessness, coughing up blood, unexplained weight loss or tiredness and aches or pains when breathing or coughing.

Doctors may recommend a chest X-ray as the first test for lung cancer if patients are experiencing any of these symptoms and are thought to be at risk. If a nodule or 'spot on the lung' is seen in the X-ray, it can be a sign of lung cancer but may also be something else less serious. Further analysis by a specialist, including a CT scan to create more detailed images, will be needed to understand if it is lung cancer.

However, symptoms of lung cancer unfortunately often appear late, meaning that patients are usually only diagnosed at an advanced stage. For this reason, lung cancer survival rates remain low despite great advancements in treatment options.

Further, treatment can be complicated by other lung diseases that commonly appear alongside lung cancer, such as emphysema and/or chronic obstructive pulmonary disease (COPD). These conditions make breathing more difficult and are also linked to smoking and air pollution, as well as workplace exposure to chemical fumes and dust (e.g. from mining, or processing cotton, grain or wood).

Due to the complexity of the disease and it often presenting at an advanced stage, a specialist team is key to developing the most effective treatment strategy for each patient.



A TEAM OF EXPERTS BEHIND EVERY PATIENT



Our multi-disciplinary teams work together to share expertise and ensure the best outcomes for our patients.

As one of the world’s leading heart and lung care centres, we diagnose and treat hundreds of lung cancer patients each year, with many coming from other countries just to see our experts privately.

Each patient case is reviewed by multiple specialists rather than just one, as part of a ‘multi-disciplinary team meeting’. These meetings were first mandated by the UK National Cancer Plan in 2000 as a new gold standard of care for cancer patients in the NHS but are now an integral part of care delivery for all patients at our hospitals, regardless of their condition and are held twice weekly.

“Rather than patients having to seek a second opinion for their treatment, this is automatically built into our care pathways. They not only get a second opinion, but often a third, fourth and fifth expert all in the same room – from diagnostic to surgical specialists – offering their opinions on the best treatment strategy for a patient,” explains our consultant thoracic surgeon, Professor Eric Lim.

“For example, our world-renowned lung imaging and histopathology specialists can diagnose the type, location and stage of cancer with the greatest accuracy to help guide our thoracic surgeons on the best approach to surgical removal of the cancer with minimal harm to healthy lung tissues. This coordinated approach to care greatly improves the outcomes for each patient.”

Our centre has been identified as having one of the highest survival outcomes in lung cancer surgery by Getting It Right First Time. This is a national programme in the UK which aims to improve medical care within the NHS by identifying changes to services that can improve patient outcomes and sharing best practice between trusts.

We also collaborate with cancer specialists at the renowned Royal Marsden Hospital, where they provide expertise in chemotherapy, radiotherapy and immunotherapy treatment for our patients. Our specialists, in return, provide expertise in thoracic surgery procedures, including minimally invasive procedures, for all their lung cancer patients.

In addition, as our patients rarely present with one medical condition in isolation, our consultant respiratory physicians and cardiologists also offer expertise in treating other heart and lung conditions patients may have, such as emphysema, COPD and coronary artery disease, for a holistic approach to care.

One area of increasing importance is the field of cardio-oncology (heart health in cancer patients). Medical advances have led to patients surviving cancer-free for many years after treatment but life-saving treatments such as chemotherapy, can result in cardio-toxicity. Our experts can identify patients at highest risk of cardiotoxicity before they start treatment, so that we can take measures to best protect their hearts and blood circulatory system.

ENHANCED LUNG CANCER SCREENING

The chances of survival with advanced lung cancer are unfortunately low at just 20%. It is therefore important to capture the disease in its earliest stages for the greatest chance of treatment success.

Our lung cancer risk assessment service offers those at an increased risk of developing lung cancer (such as those aged over 50 and a long history of smoking) or worried about the symptoms (such as a persistent cough or dull ache in the chest) the chance to be comprehensively reviewed by one of our specialists in respiratory medicine.

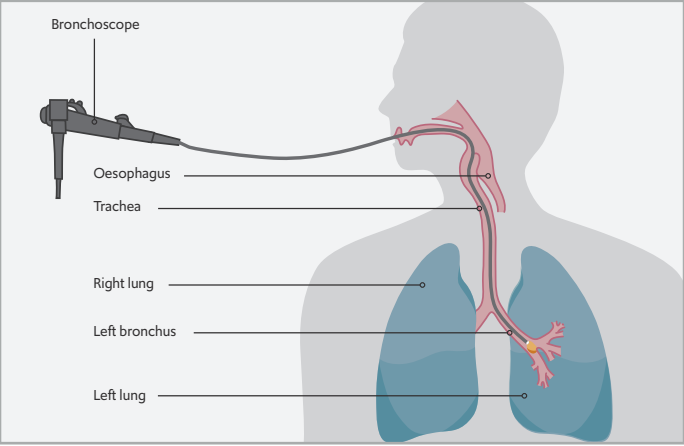
Following the assessment, patients may be recommended to have a low dose chest CT scan. This imaging test can detect lung cancer in its earliest stages, at stage 1 or 2, even before symptoms are present.

EXPERTS IN MINIMALLY INVASIVE PROCEDURES

At RB&HH Specialist Care, our experts are dedicated to minimising the impact of surgical and non-surgical interventions on our patients, to improve recovery times and reduce the pain experienced compared to traditional open surgery.

We currently offer two key minimally invasive procedures for lung cancer removal, depending on the type and stage of cancer.

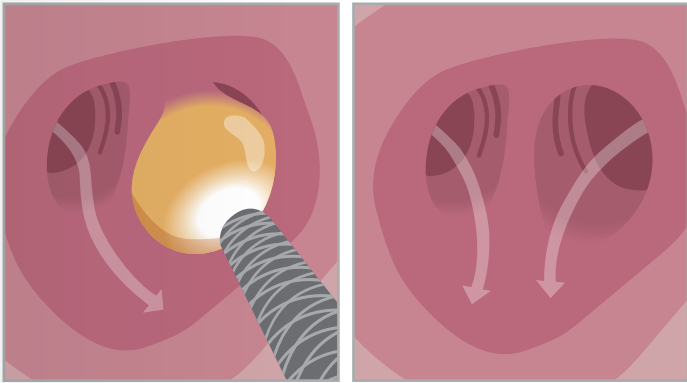
Endobronchial cryotherapy



A bronchoscope with a camera at its end is used to access the cancer growth from within the lung’s airways to apply the freezing cryotherapy treatment directly to it.

Endobronchial cryotherapy uses a bronchoscope – a flexible tube-like device with a camera at its end – to reach the part of the airways affected by cancer and apply a cryogen from its tip directly to the cancer to kill it.

“It is a short minimally invasive procedure lasting around 20 minutes and has been used for over 25 years for the effective treatment of lung cancers blocking the airways. It is a suitable option for patients with advanced lung cancer that cannot be operated on and have few other

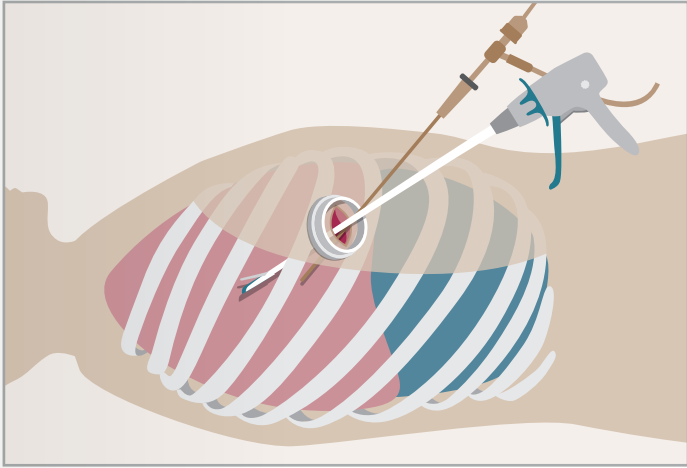


The freezing cryotherapy treatment is applied directly to the cancer growth in the airway to kill it.

treatment options available, where it helps them to breathe better,” explains our consultant thoracic surgeon, Mr Nizar Asadi.

“If we manage to catch lung cancers early enough when they are small and localised to the airways, the treatment can be curative in some patients. Otherwise, it can work to reduce the size of the cancer growth so that less of the lung tissue needs to be removed during a lung resection procedure and so ensuring lung function is preserved as much as possible.”

Keyhole thoracic surgery

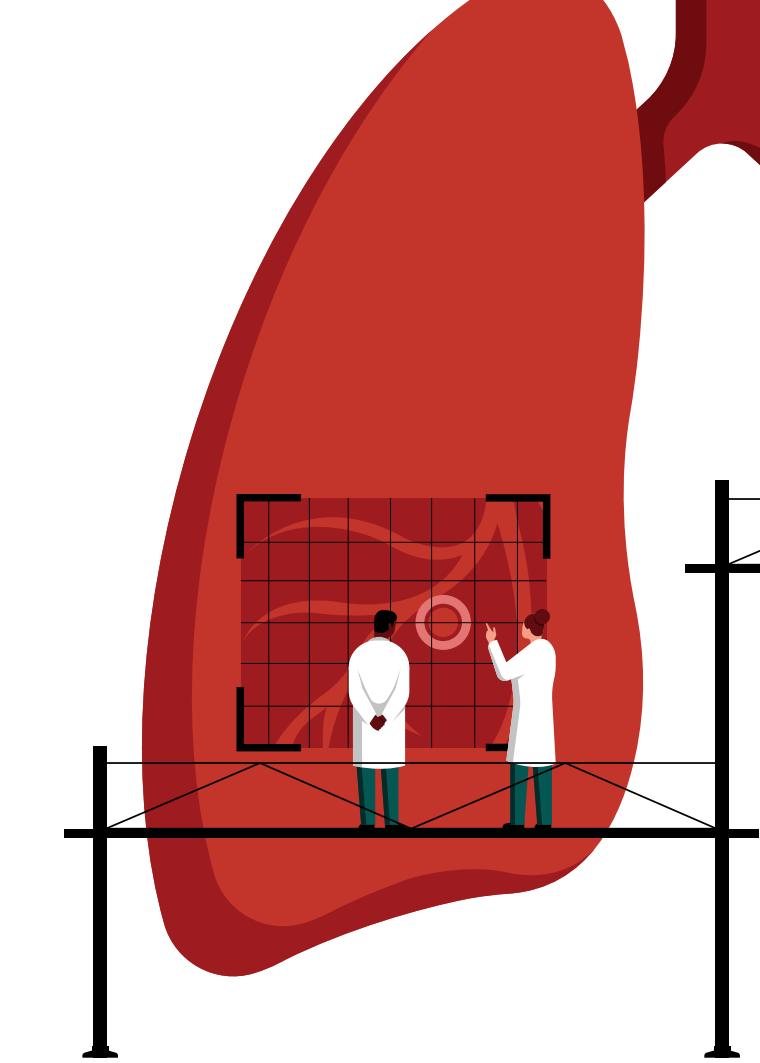


Single-port (or single-incision) video-assisted thoracoscopic surgery is a minimally invasive keyhole surgical procedure that can be used to remove lung cancers.

Video-assisted thoracoscopic surgery (VATS) offers lung cancer patients a minimally invasive option to remove parts of the lungs affected by cancer to help prevent the spread of the disease.

Single-port (or single-incision) VATS offered at our centre, is a keyhole surgery procedure, where a camera and surgical instruments are inserted into the chest via one small incision to navigate to the part of the lung affected, avoiding the need for open thoracotomy (open chest surgery).

“Results from the VIOLET study which involved 503 patients from multiple centres in the UK showed that patients undergoing a VATS procedure experienced significantly less pain, better physical function and fewer complications compared to traditional open lung surgery. They also spent one day less in hospital, on average,” explains Professor Lim, who led the study.



Professor Eric Lim
Consultant thoracic surgeon

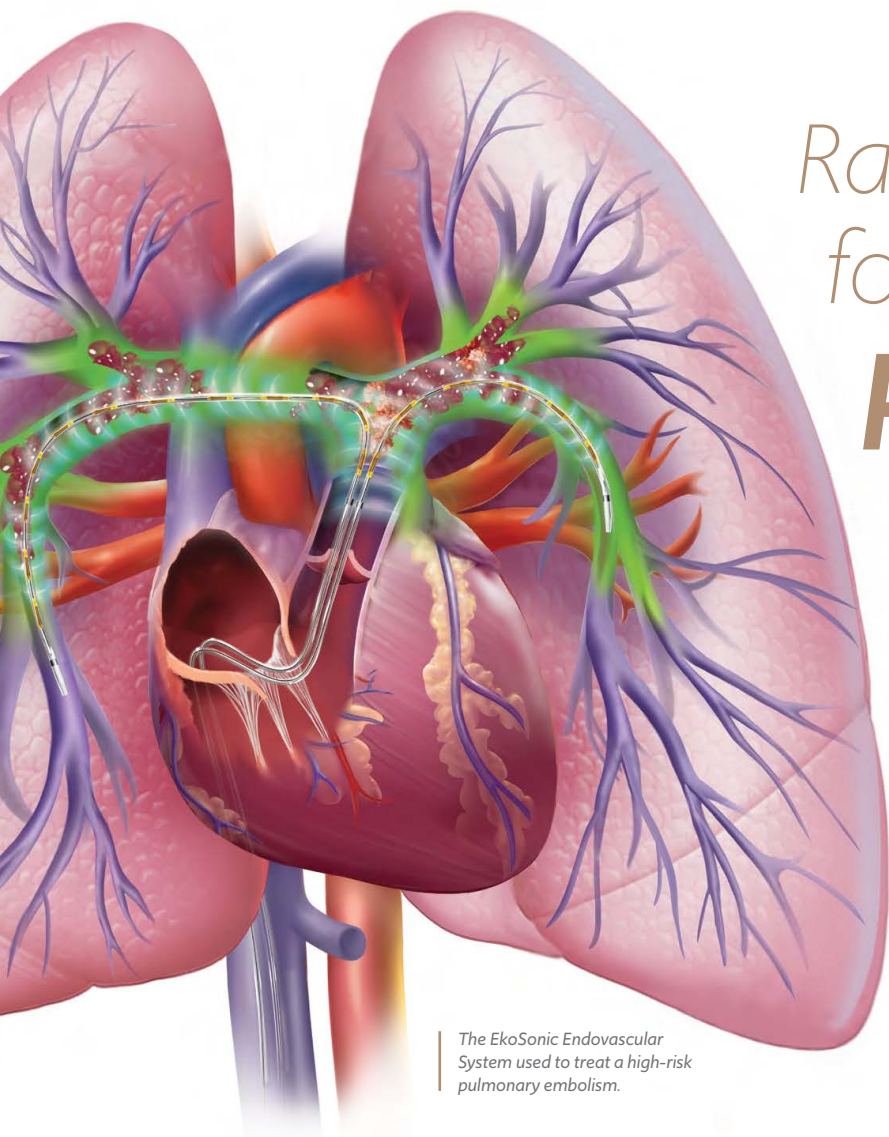
Professor Lim specialises in minimally invasive procedures for lung and chest cancer and pioneered the single-incision keyhole surgery programme for lung cancer at our hospitals. He leads multiple clinical trials to advance the field of lung cancer medicine.



Mr Nizar Asadi
Consultant thoracic surgeon

Mr Asadi specialises in adult and paediatric thoracic surgery, including minimally invasive lung cancer procedures. He is also the London Thoracic Lead for Getting It Right First Time, a national programme of the NHS to improve the quality of patient care.

To find out more about the our specialist lung cancer risk assessment service and treatments, please contact our customer services team on **+44 (0)20 3131 0535** or email **privatepatients@rbht.nhs.uk**



The EkoSonic Endovascular System used to treat a high-risk pulmonary embolism.

Rapid treatment for high-risk Pulmonary embolism

A high-risk pulmonary embolism can be fatal if not treated promptly. Our radiology specialists use advanced dual-energy CT to rapidly diagnose the presence, location and extent of the clot most accurately in the lungs and offer two minimally invasive procedures to treat the condition.

PULMONARY EMBOLISM: A LIFE-THREATENING PROBLEM

A pulmonary embolism (PE) can occur when one or more emboli – usually arising from a blood clot in the deep veins of the legs – become lodged in the pulmonary arterial system.

The exact prevalence of the condition is unknown as PE can be challenging to diagnose with a wide spectrum of symptoms – ranging from asymptomatic, in the case of small PE, to sudden death if the PE is large.

Across this spectrum, PE is one of the most common cardiovascular diseases in developed countries – third only to heart attacks and strokes.

In the UK, the annual incidence of diagnosed PE is 7-8 per 10,000 people, with 47,594 cases reported during the 1-year period between 2013 and 2014 (the most recent report).

High-risk PE occurs when the pulmonary circulation is suddenly obstructed. To compensate for this, the right ventricle works harder to increase pulmonary systolic pressure. This puts strain on the thin-walled right ventricle which normally works against low pressure.

If this increase in right ventricular output cannot be sustained, it can lead to right heart failure and death. The overall mortality rate for high-risk pulmonary embolism can reach up to 65%, with treatment lowering this to 20%. It is therefore imperative that patients receive treatment to remove the obstruction swiftly.

The clinical classification of PE severity is based on mortality risk. This classification determines the type of treatment patients receive. “High-risk” PE is defined as a PE which causes a sustained systolic blood pressure less than 90 mmHg. In this situation, reperfusion is the goal of

care, either through systemic (i.e. thrombolytic) or localised treatment of the PE (i.e. surgical or catheter-directed therapies).

If patients do not exhibit systolic hypotension but exhibit other features of shock and/or have pre-existing conditions which may contribute to a worse outcome, this is assessed using a PE severity index (PESI) and if this score is significantly elevated, the patient may be stratified as “Intermediate-high-risk”.

Intermediate-high-risk PE consists of relative hemodynamic stability with a high PESI score, right ventricular dysfunction, and positive cardiac biomarkers. Intermediate-high-risk PE is primarily treated with anticoagulation. If, however, anticoagulation is contraindicated, or if haemodynamic compromise develops, catheter directed therapies are recommended.

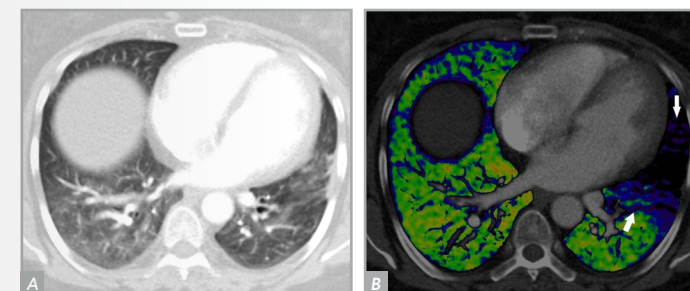
IMPROVING DIAGNOSTIC ACCURACY WITH DUAL-ENERGY CT

Given the broad range of symptoms experienced with acute PE, clinical evaluation can be limited in achieving a diagnosis.

Some clinical features can increase the likelihood of PE, including a family history, certain cancers (such as lung and ovarian cancer), long-term immobility (such as that experienced with long-haul flights and prolonged bed rest), pregnancy, oral contraceptive therapy and COVID-19 infection.

“When a pulmonary embolism is suspected, it is important that patients are assessed by a doctor as soon as possible to confirm the diagnosis and determine the severity of PE,” explains our cardiothoracic and interventional radiologist, Dr Carole Ridge.

“At Royal Brompton and Harefield hospitals, we have expertise in dual-energy CT pulmonary angiography – a specialist diagnostic tool which accurately diagnoses the presence, location and extent of a pulmonary embolism. This technique helps develop the best treatment strategy and has been particularly useful in the case of high-risk PE.”



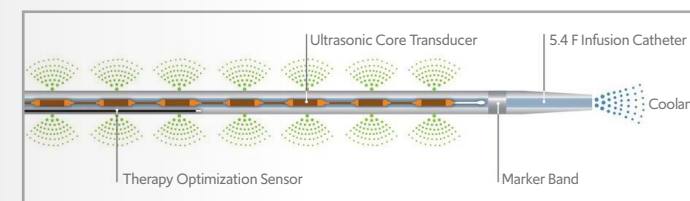
Increased PE clarity with dual-energy CT. (A) A conventional CT angiography scan of a patient with a pulmonary embolism in the left lung. (B) A dual-energy CT scan of the same patient with arrows indicating the location of the pulmonary embolism visualised more clearly in black. The right lung is well supplied by blood vessels shown in green.

TWO SPECIALIST MINIMALLY INVASIVE APPROACHES TO TREATMENT

We offer two minimally invasive procedures at Royal Brompton Hospital for patients with high-risk or intermediate-high-risk PE. They can be used as standalone treatments or in combination depending on the condition of the patient.

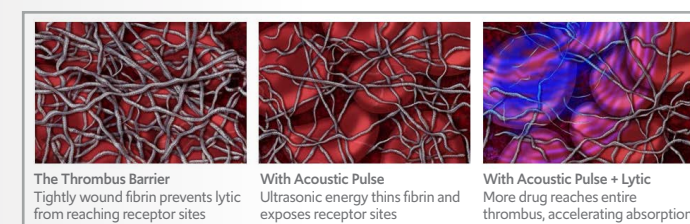
Catheter-directed acoustic pulse thrombolysis

Systemic thrombolysis has been consistently shown in randomised controlled trials to rapidly improve right ventricular function in patients with high-risk PE. However, it also significantly increases the risk of bleeding complications. In treatment registries, systemic thrombolysis has been associated with major bleeding rates as high as 20% and intracranial haemorrhage in up to 3%.



The Boston Scientific EkoSonic Endovascular System enables thrombolytic drugs to be delivered locally to the pulmonary embolism and an acoustic pulse helps accelerate absorption of the drug and its thrombolytic effect.

The EkoSonic Endovascular System offers an alternative approach to systemic thrombolysis. It is a catheter-based system that can deliver thrombolytic agents directly to where they are needed with ultrasonic core elements that deliver ultrasound energy locally.



The EkoSonic Endovascular System's ultrasound waves accelerate clot dissolution.

The acoustic pulse generated by the ultrasonic core causes fibrin within the clot to fragment. This enables thrombolytic agents to enter more deeply into the clot and exposes plasminogen receptor sites to accelerate the absorption and thrombolytic effect of the agent when compared to catheter-based delivery alone.

Aspiration thrombectomy

“For patients that are not suitable for thrombolysis, such as those at increased risk of bleeding, mechanical aspiration thrombectomy is an alternative option to treat high-risk PE,” explains Dr Ridge.



The Penumbra Indigo thromboaspiration system.

The Indigo thromboaspiration system offers an advanced approach to treating pulmonary embolism by achieving thrombectomy with or without the use of thrombolytic drugs. Powered by a vacuum pump, the system works in conjunction with an 8 Fr catheter to deliver powerful aspiration and actively remove thrombus.

“We are pleased to be able to offer these two different minimally invasive procedures to treat high-risk pulmonary embolism at our hospital, enabling us to tailor treatment to the needs of our sickest patients,” says Dr Ridge.

“For the best results, patients are assessed by our team of experts in radiology, intensive care and pulmonary hypertension medicine.”



Dr Carole Ridge
Consultant cardiothoracic and interventional radiologist

Dr Ridge specialises in CT of the heart and lungs and minimally invasive treatment of cardiopulmonary diseases. She contributes to numerous peer-reviewed publications and is an editor for Lung Cancer Journal.



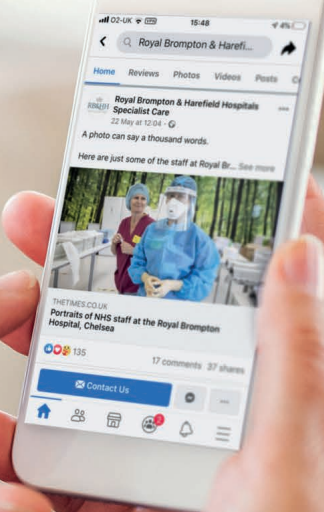
Professor Simon Padley
Consultant radiologist

Professor Padley specialises in thoracic and vascular imaging and intervention and developed the service for high-risk pulmonary embolism at our hospitals.

To find out more about our high-risk pulmonary embolism treatments, please contact our team on **+44 (0)20 3131 0535** or email **privatepatients@rbht.nhs.uk**

Social news feed

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
SPECIALIST CARE

Our heart screening service



PREVENTING A STROKE



Preventing a stroke

On World Stroke Day, we'd like to share four steps you can take to reduce your risk of having one. Eating a heart healthy diet, exercising regularly and avoiding smoking and drinking too much alcohol can all help prevent you from having a stroke

Read more on [f](#)



Living with sickle cell disease can be challenging, but I'm proud that I can inspire my daughters to do anything they want in life.

Patricia Anglin
Primary care manager



Celebrating Black history month

As a primary care manager, Patricia Anglin helps GPs with their professional development and navigating our services. In addition to juggling a successful career and caring for two daughters, she is a #sicklecellwarrior. #BlackHistoryMonth #ProudToBe

Read more on [t](#)



As a general and interventional cardiologist, I regularly see patients with symptoms such as chest pain, palpitations and high blood pressure. My experience in treating a wide range of heart conditions allows me to offer the best quality care to my patients.

Dr Wala Mattar
Consultant general and interventional cardiologist



Meet Dr Wala Mattar

We'd like to introduce you to a new member of our team – Dr Wala Mattar. Dr Mattar is a consultant cardiologist with expertise in all aspects of general cardiology. She treats a range of conditions including angina, heart valve disease, heart failure and hypertension.

Read more on [in](#)



Delivering our mission of being a leading specialist hospital

Dr Richard Grocott-Mason began working at Harefield Hospital 22 years ago and has dedicated himself to providing great patient care in a variety of clinical roles. Since our merger with Guy's and St Thomas' NHS Foundation Trust, Dr Grocott-Mason has embarked on his new role as Royal Brompton and Harefield hospitals' managing director, and is very excited about the future and the improvements to the quality of care we provide.

Read more on [f](#)



Royal Brompton Centre for Sleep is here to help you

Whether it's difficulty falling or staying asleep (insomnia) or troublesome snoring, our world-leading sleep experts can help diagnose and treat a range of sleep disorders quickly. If needed, we can perform an overnight sleep study where we take multiple recordings of your breathing and movements while you sleep, to help pinpoint what condition you may have.

Read more on [f](#)

Lucy Davies



Meet RB&HH former colleague, Lucy Davies

Meet former colleague Lucy Davies, who developed a love for specialist hospitals. Discover how she was welcomed, the challenges and fun acronyms she learnt. Sign up to view the full interview and reconnect with other colleagues <https://bit.ly/RBHHalumni>

Read more on [t](#)

We can check patients' hearts to make sure they're healthy

Our heart screening service offers a range of diagnostic tests that help us check for underlying heart problems at the earliest stages, even before symptoms appear.

Whether it's a heart rhythm problem or risk factors for heart disease like high blood cholesterol, our team of cardiology experts will provide the answers needed to ensure your patients' hearts stay as healthy as possible.

To find out more, visit our website
rbhh-specialistcare.co.uk



Royal Brompton & Harefield Hospitals Specialist Care

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