Case Notes

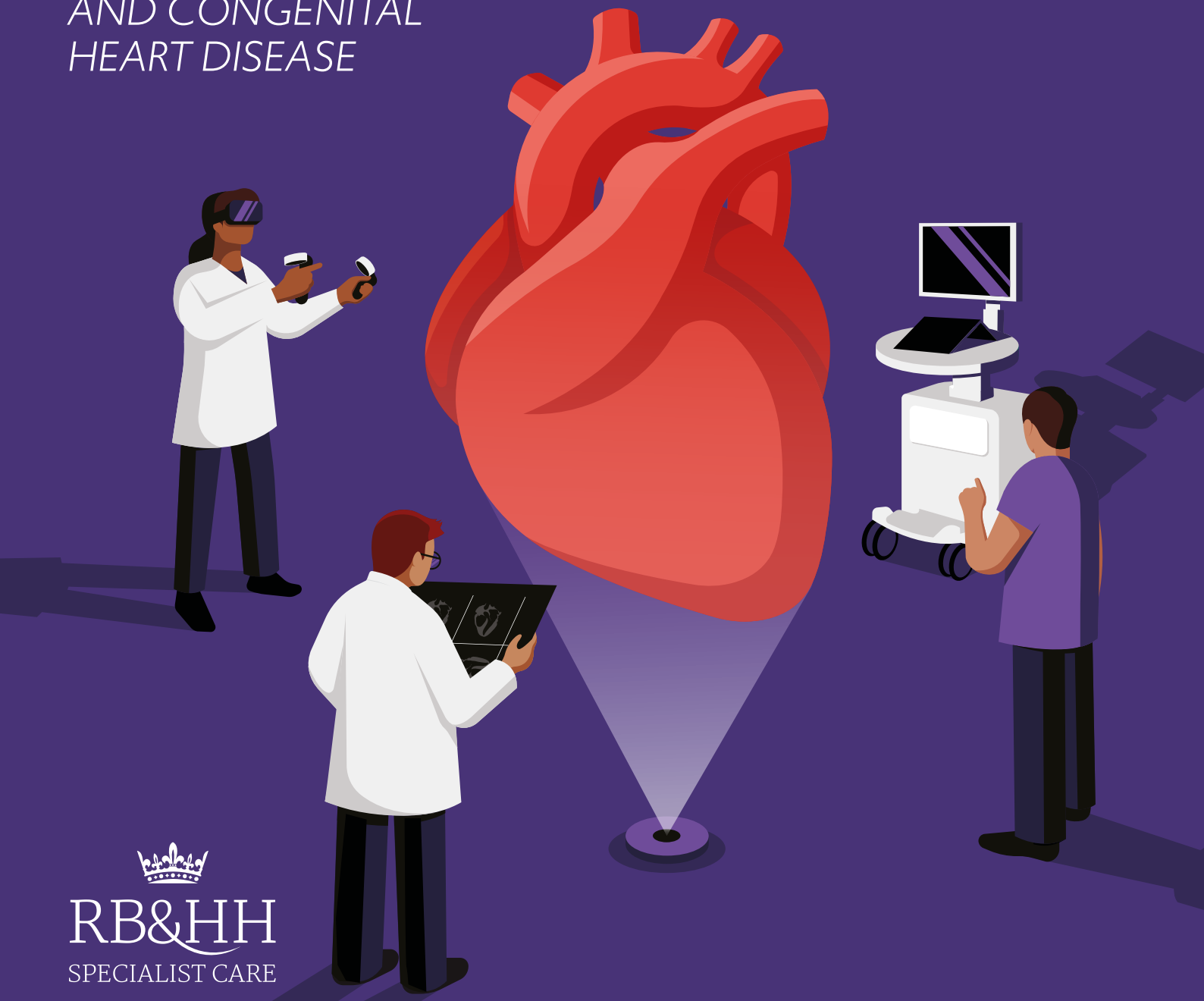
Royal Brompton & Harefield Hospitals Specialist Care

A NEW MINIMALLY INVASIVE TREATMENT FOR TRICUSPID REGURGITATION

THE GROWING BURDEN OF FUNGAL LUNG DISEASE

FLIRT: A NEW MINIMALLY INVASIVE APPROACH TO AORTIC REPAIR

PIONEERING CARE
IN PAEDIATRIC CARDIOLOGY AND CONGENITAL HEART DISEASE



RB&HH
SPECIALIST CARE

a part of Guy's and St Thomas' NHS Foundation Trust

News · Case Studies · Insight

Autumn/Winter 2022

Welcome to the Autumn/Winter 2022 edition of Case Notes

We are confident that our merger with Guy's and St Thomas' NHS Foundation Trust will streamline our offering and combine our expertise to provide best-in-class care to our private patients.

We continue to lead with innovations that keep our patients at our core, and are proud that Royal Brompton Hosptial and Harefield Hospital have been recognised as some of the best heart and lung centres in the world for the third year running (page 3). In addition, Evelina London Children's Hospital and Guy's and St Thomas' Hospital have been acknowledged for their paediatric services.

In this edition of Case Notes you will discover some of our world-first paediatric cardiology procedures and read about how our consultants are using virtual reality technology to review patients' hearts before surgery (page 4).

In addition, having pioneered a variety of minimally invasive procedures, we have expanded our offering of alternative options for patients, enhancing recovery in the process.

For example, our new FLIRT treatment enables us to seal aortic tears without open-heart surgery (page 13), and we have developed a minimally invasive treatment for tricuspid regurgitation (page 10).

You will find further information on how our respiratory consultants are diagnosing fungal lung disease with the most subtle symptoms, as well as our new pre-conception heart screening service.

David Shrimpton

Managing Director,
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What's new?

IMPROVED DERMATOLOGY SERVICE STARTS AT HAREFIELD

Patients at Harefield Hospital are benefiting from a newly improved service offering advice on skin conditions, thanks to the hospital's merger with Guy's and St Thomas' NHS Foundation Trust.

The dermatology service is key for Harefield's inpatients, many of whom need to stay in the hospital for a while and are particularly susceptible to skin complaints, which can compromise the body's natural defences.

Even with careful monitoring and treatment, ulcers and sores can develop, and so treating these skin conditions is really important for the patients' future health.

Harefield has had a dermatology service for many years, provided by a local hospital, however, that changed to Guy's and St Thomas' following the merger. Guy's and St Thomas' has a much larger dermatology department with 16 different specialist teams, so it has both greater resources and a wider spread of specialist expertise.

Harefield general manager Michael White said: ***"We're really pleased we've been able to improve our dermatology service in this way. Guy's and St Thomas' has a more comprehensive service and a really significant, expert team, so everyone agreed that with our new merged organisation, this was a just a really good solution."***

St Thomas Hospital

THE ART OF CREATING A HEALING ENVIRONMENT

Royal Brompton and Harefield Hospitals' arts team, rb&hArts, transformed the new Royal Brompton Diagnostic Centre with art commissions, pushing the boundaries of healthcare design and prioritising wellbeing for patients and the staff guiding their recovery.

The Diagnostic Centre provides cutting-edge imaging services to help diagnose heart and lung disease cases. It expands clinical services, improves patient experience, and enhances staff research, education, and training programmes.

Karen Janody, rb&hArts' manager and project lead, said: ***"The pieces we commissioned aimed to bring the outside in. We wanted to create a holistic centre, using the healing power of nature and biophilia, to enhance the experience for our patients and lower stress levels for patients coming in for tests."***

The rb&hArts team recently won a Highly Commended Art & Interior Design Award at the European Healthcare Design Congress for the Diagnostic Centre. The award recognises professional excellence in the design of healthcare environments in Europe and worldwide.

Royal Brompton Diagnostic Centre reception area (photograph by Simon Kennedy)

Professor Thomas Lüscher

PROFESSOR THOMAS LÜSCHER VOTED PRESIDENT ELECT FOR THE BOARD OF THE EUROPEAN SOCIETY OF CARDIOLOGY

Professor Thomas Lüscher, consultant cardiologist and director of research, education and development, at Royal Brompton and Harefield hospitals, has been elected by members of the European Society of Cardiology (ESC), one of the world's largest medical societies, to serve as President Elect for the Board until the end of 2024.

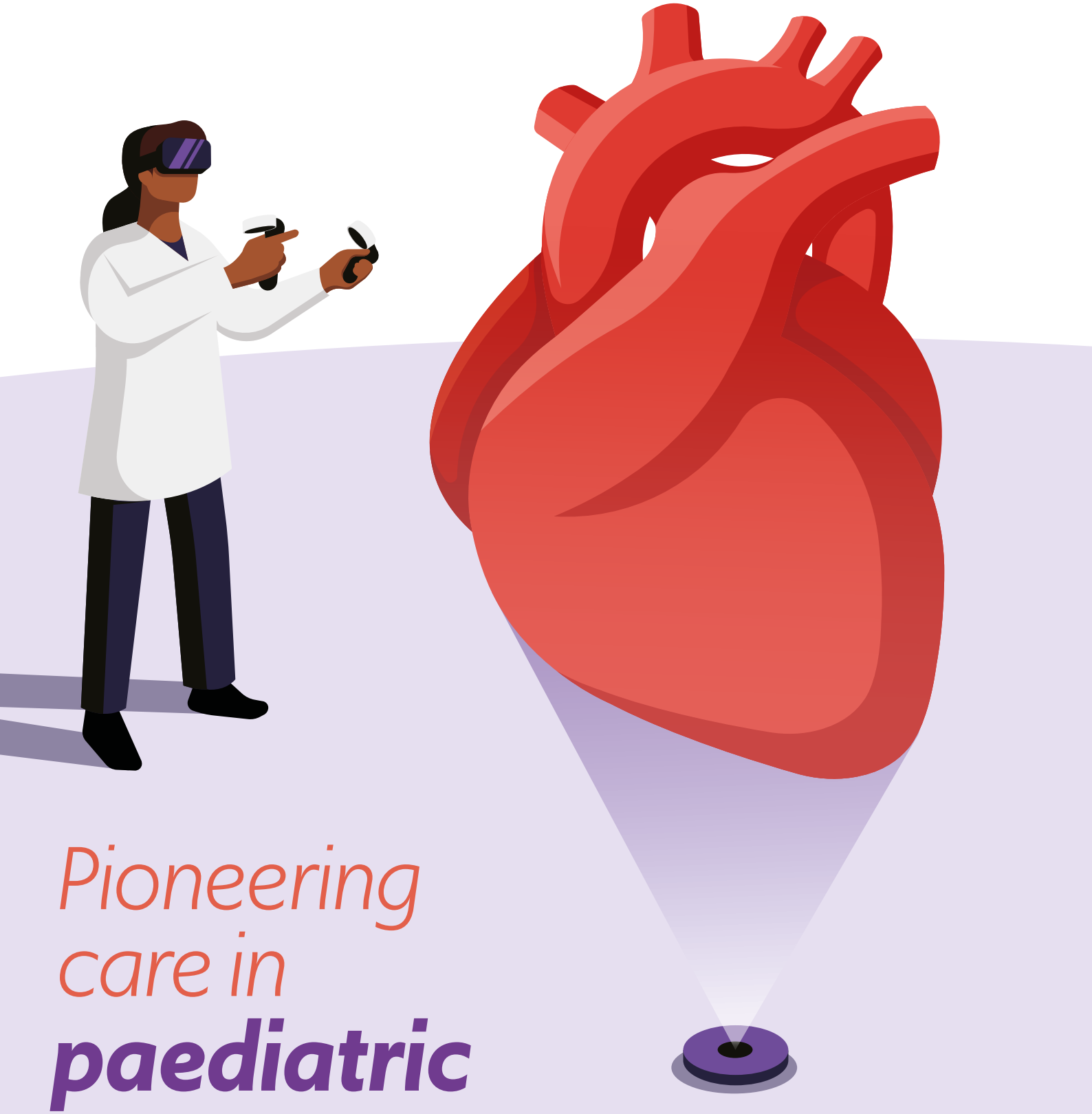
Professor Lüscher spoke on his appointment, saying: ***"I am deeply honoured and delighted to be able to serve this outstanding society, but respectful of the challenges ahead in a changing environment in medicine and cardiology in particular. I am also proud to be able to act as an ambassador of Royal Brompton and Harefield hospitals in the cardiovascular community."***

OUR HOSPITALS NAMED IN NEWSWEEK'S LIST OF WORLD'S BEST HOSPITALS

Our hospitals have been ranked as some of the best centres in the world by Newsweek, the American weekly news magazine.

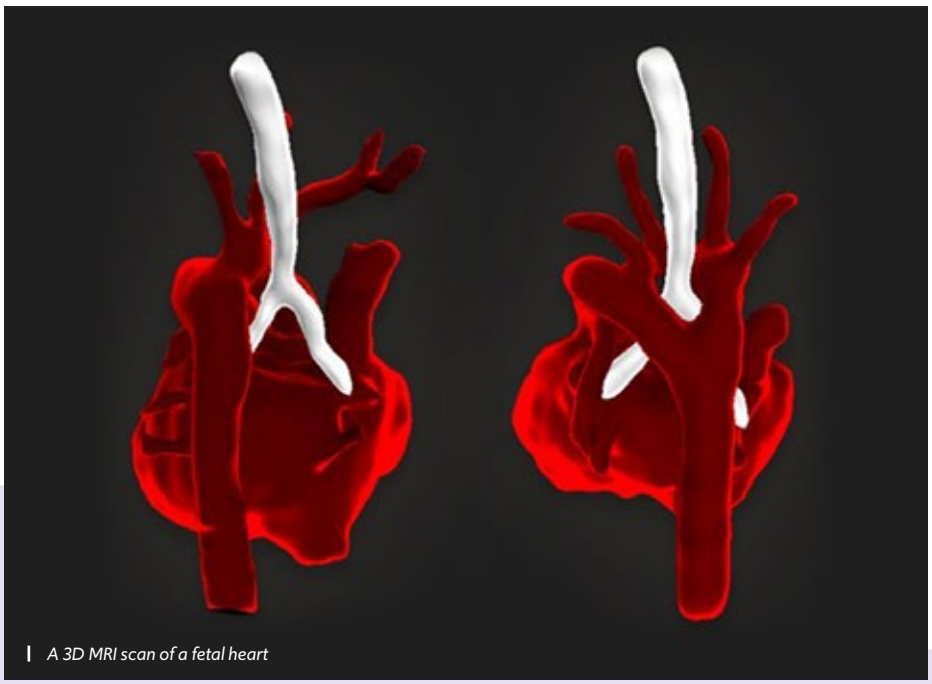
Its list of 'World's Best Specialized Hospitals 2023' is based on a global survey of 40,000 medical experts in over 20 countries.

Royal Brompton Hospital was recognised in the top 10 for cardiology and the top 20 for cardiac surgery. Harefield Hospital was also listed for its heart and lung expertise, and Evelina London Children's Hospital and Guy's and St Thomas' Hospital have been acknowledged for their paediatric services.



Pioneering care in ***paediatric cardiology and congenital heart disease***

Our paediatric cardiology specialists at Royal Brompton and Evelina London Children's hospitals have a long history of pioneering innovative heart diagnostics and procedures, treating patients from before birth and into adulthood.



A 3D MRI scan of a fetal heart

PAEDIATRIC CARDIOLOGY REQUIRES A TOTAL-BODY APPROACH TO CARE

Children may experience a range of heart problems, either from birth or as they develop.

Some common heart concerns like heart murmurs may not require any treatment and resolve themselves over time as the heart grows and develops. They are often managed locally with a family GP and only referred to a specialist paediatric cardiologist if it is thought to be a structural problem with the heart.

Other heart problems like congenital heart disease, acquired paediatric heart disease and arrhythmias can be more complex to treat and affect multiple organs.

For example, 1 in 4 children with congenital heart disease also have a problem with another organ or system in their body. They can require additional specialist support in areas such as gastroenterology, nephrology and neurology.

With these complex heart conditions, a specialist multidisciplinary paediatric centre like Evelina London Children's Hospital can offer the best support with its total-body approach to care.

PUSHING BOUNDARIES IN DIAGNOSTIC IMAGING

"Congenital heart diseases cause structural problems with the heart that can require surgical intervention soon after birth, often within the first week of life," explains Dr Owen Miller, our consultant in paediatric and fetal cardiologist at Evelina London Children's Hospital.

> ***"It is therefore important to precisely diagnose the type of congenital heart disease in the unborn baby during pregnancy to ensure we can prepare for surgery soon after delivery and achieve the best outcomes."***

Evelina London Children's Hospital has the largest and longest established fetal cardiac service in the UK, overseeing 2,000 pregnancies a year for the diagnosis of congenital heart disease.

With the close academic partnership between Evelina London scientists and the biomedical engineering department at King's College London, it is at the forefront of research into fetal and paediatric cardiac diagnostic imaging.

Through this partnership, the team have jointly developed a world-first method to conduct 3D MRI scans that improves the ability to diagnose congenital heart disease in babies while still in the womb. This builds on the team's work conducting the world's first ever fetal cardiac MRI scan.

This feat was achieved with novel computing technology that corrects for movement in tiny, fast-moving unborn babies which otherwise makes diagnosis hard with ultrasound methods paediatric cardiologists at other centres are limited to.

Procedures to correct structural problems in the heart can be complex, particularly with the small hearts of children and babies. Our scientists have also developed virtual reality technology to enable our cardiac surgeons to immerse themselves into a 3D image of a patients' heart to help plan surgery and ensure the best outcomes.

By using the latest high-resolution ultrasound scanners at our fetal cardiology unit, our paediatric cardiologists can detect heart defects sooner in unborn babies – as early as 12 weeks into a pregnancy, instead of the routine 20-week scan.

As specialist maternity services are available on site, babies with heart defects detected before birth can be safely delivered, transferred to surgery soon after birth and receive all their follow-up and multidisciplinary care in one location.

Our cardiac surgeons use virtual reality technology to review a patient's heart before surgery.

A HISTORY OF WORLD-FIRST HEART PROCEDURES

Both Royal Brompton and Evelina London Children's hospitals have a long history of pioneering heart procedures that improve the health of patients with congenital heart disease.

Between our hospitals, we have performed many world-firsts, including the first:

- autograft aortic valve replacement (Ross Operation)
- fetal cardiac intervention
- MRI-guided cardiac catheter procedure
- PEARS procedure
- radiofrequency perforation of pulmonary valve
- Ross-PEARS combined procedure.

We also have world-renowned expertise in transcatheter interventions, including:

- closure of complex atrial septal defects
- closure of patent ductus arteriosus
- closure of peri-membranous ventricular septal defect
- closure of sinus venosus defects implantation of the venus p valve in the pulmonary position.

> ***Recent data suggests that over 97% of children born with congenital heart disease now survive into adulthood, which is a tremendous achievement."***

"With our combined expertise in cardiac surgery and imaging across Royal Brompton and Evelina London Children's hospitals, we offer procedures that treat the most complex forms of congenital heart disease from before birth and through to adulthood," says Mr Caner Salih, chief of cardiac surgery at our hospitals.

Mr Salih is one of the few UK surgeons performing the Nikaidoh and double root translocation procedures for complex conotruncal anomalies. He has also led our hospitals in achieving outstanding outcomes in all aspects of paediatric cardiac surgery, including the Norwood open-heart operation for hypoplastic left heart syndrome.

In addition to surgical procedures to treat structural problems of the heart, our consultant cardiologists and electrophysiologists are experts in minimally invasive procedures to correct heart rhythm disturbances, including cardiac ablation.

PERSONALISED LIFE-LONG CARE FOR EVERY PATIENT

"Treatments for congenital heart disease have improved greatly in recent decades as we continue to advance care. Recent data suggests that over 97% of children born with congenital heart disease now survive into adulthood, which is a tremendous achievement," says Professor Alain Fraisse, consultant paediatric cardiologist at Royal Brompton Hospital.

"However, this presents challenges as some adults with congenital heart disease have complex health needs and require life-long specialist monitoring and care. As the largest centre for congenital heart disease in the UK, we have the expertise to treat every cardiac eventuality."

Following a successful pilot in 2020, both our adult hospital sites (Royal Brompton and St Thomas' Hospital) now offer a one-stop adult congenital heart disease (ACHD) service where patients can receive all their routine monitoring diagnostic tests and see their consultant cardiologist and specialist cardiology nurse all on the same day.

"Our ACHD service greatly improves the care offered to our patients. Rather than waiting for multiple diagnostic tests that are sometimes arranged months apart on the NHS, they receive a convenient one-day service designed around them with minimal impact to their routine," explains Professor Michael Gatzoulis, consultant cardiologist and clinical and academic lead for adult congenital heart disease at Royal Brompton Hospital, who led the development of the service.

Professor Fraisse and Professor Gatzoulis lecture at Imperial College London, and Dr Miller is part of the academic team at Kings College London ensuring paediatric cardiology services across our hospitals benefit from the cutting-edge research at two of the world's top universities.

Professor Alain Fraissé
Consultant paediatric cardiologist

Professor Fraissé specialises in interventional catheterisation and echocardiography in children and adults with congenital heart disease, as well as all areas of paediatric cardiology and valvular heart disease.

Professor Michael Gatzoulis
Consultant cardiologist

Professor Gatzoulis specialises in adult congenital heart disease, heart valve disease, management of heart failure, heart disease in pregnancy and pulmonary arterial hypertension.

Mr Owen Miller
Consultant in paediatric and fetal cardiology

Dr Miller specialises in all areas of paediatric and fetal cardiology, including advanced imaging of these patients with echocardiography and MRI to determine the presence of congenital heart disease.

Mr Caner Salih
Chief of paediatric cardiac surgery

Mr Salih specialises in cardiac surgery across the whole age range from neonates to adults. He has a particular interest in complex neonatal surgery and is one of the few surgeons in the UK performing the Nikaidoh and double root translocation procedure for complex conotruncal anomalies. He and his team have established outstanding results for the Norwood procedure in treating hypoplastic left heart syndrome.

Professor John Simpson
Professor of paediatric and fetal cardiology

Professor John Simpson has more than 20 years' experience in paediatric and fetal cardiology. He participates in both acute and outpatient management of patients with congenital heart disease. His particular focus is on ultrasound imaging of the heart, with sub-speciality interests in prenatal diagnosis, 3D echocardiography and transoesophageal echocardiography.

If you are concerned about the health of your child's heart and would like to speak to one of our paediatric cardiology specialists, please contact our team at **Evelina London Children's Hospital** or **Royal Brompton Hospital** to arrange an appointment.

Dr Owen Miller (right) with baby Abdulrahman, consultant obstetrician Mr Dharmintra Pasupathy and respiratory consultant Dr Jane Heraghty

A PAEDIATRIC CARDIOLOGY CASE LIKE NO OTHER

Our international paediatric patient Abdulrahman from Kuwait was nicknamed 'the little survivor' by our team at Evelina London, as his fight for life began before he was even born.

He was diagnosed with the rare congenital heart disease hypoplastic left heart syndrome by Dr Miller while still in his mother's womb, which would require surgical intervention soon after birth.

After his delivery at St Thomas' Hospital, Mr Salih conducted surgical procedures – including the complex Norwood procedure – to treat his heart condition soon after birth.

However, soon after surgery and while in our paediatric intensive care unit, he was starting to get very unwell and not putting on the weight he should.

After conducting a range of tests on his lungs, our paediatric respiratory specialists discovered he had primary ciliary dyskinesia, an extremely rare lung condition that prevents his lungs from effectively clearing mucus in its linings, among other organ complications.

The combination of these rare conditions on one patient is believed to be the first in the UK.

Thankfully, with our comprehensive multidisciplinary expertise on one site at Evelina London Children's Hospital across cardiology, surgery, respiratory and intensive care, Abdulrahman's condition improved, and he was able to make it home to his loving family where he continued his treatment.

Abdulrahman will need continued monitoring and likely further surgery on his heart at our hospitals in future but will be in the safest hands with our consultants.

Mr Caner Salih with baby Abdulrahman and his father

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.

Dr Mohssen Chabok, Consultant cardiologist – *Harefield Hospital*

Dr Mohssen Chabok is a consultant cardiologist who specialises in hypertension, angina, heart disease and interventional cardiology. His clinical interests include the diagnosis and treatment of angina and coronary artery disease, lipid disorders, atrial fibrillation, heart failures and valvular heart disease. He also performs a number of procedures such as angioplasty and stenting, catheterisation and complex coronary intervention.

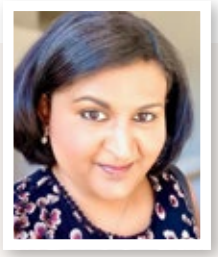
Dr Chabok's research interests include early disease detection and prevention of asymptomatic cardiovascular conditions such as diabetes, coronary artery disease and abdominal aortic aneurysm.

Dr Justin Garner, Consultant respiratory physician – *Royal Brompton Hospital*

Dr Justin Garner is a consultant respiratory physician who specialises in lung cancer, pulmonary nodules, chronic obstructive pulmonary disease (COPD), and interventional bronchoscopy.

He performs lung volume reduction (eg endobronchial valves) and novel interventional therapies for COPD as well as bronchial thermoplasty for severe asthma.

His research interests include small airways disease, inflammatory biomarkers and medical device innovation.



Dr Shruti Konda, Consultant respiratory physician – *Royal Brompton Hospital*

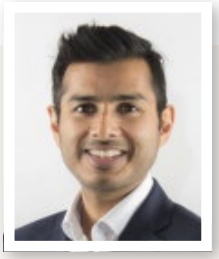
Dr Shruti Konda specialises in all adult respiratory medicine and sleep disorders. She has a particular interest in smoking-related lung diseases including emphysema and COPD, as well as sleep disordered breathing, respiratory failure and the use of Continuous Positive Airway Pressure (CPAP) and Non-invasive Ventilation (NIV).

Dr Konda is also the education lead for the British Sleep Society and organises national and international courses and conferences. She passionately works with her colleagues to drive improvements in health and healthcare through advocacy and education.

Dr Claudia Montanaro, Consultant cardiologist – *Royal Brompton Hospital, Wimpole Street*

Dr Claudia Montanaro is a consultant cardiologist who specialises in congenital heart disease, heart valve disease, and heart disease in pregnancy. She also has expertise in cardiac magnetic resonance imaging, echocardiography and heart failure and intensive care management.

Her research interests include congenital heart disease, heart disease and pregnancy and heart failure. She also leads the Univentricular (Fontan) service at Royal Brompton Hospital and is an associate editor for the International Journal of Cardiology and Congenital Heart Disease.



Dr Anand Shah, Consultant respiratory physician – *Royal Brompton Hospital*

Dr Anand Shah has expertise in a range of respiratory conditions such as fungal lung disease, including allergic bronchopulmonary aspergillosis and chronic pulmonary aspergillosis. He also has an interest in bronchiectasis, primary ciliary dyskinesia, cystic fibrosis and general respiratory disease.

Dr Shah has ongoing active research interests in several fields but primarily focuses on how to better understand and improve the outcomes in fungal lung disease. He also has research interests in bronchiectasis and the use of machine learning and data science to improve outcomes in lung infection.

Research update

CLINICAL RESEARCH FACILITY AT ROYAL BROMPTON HOSPITAL AWARDED FUNDING

The Cardiorespiratory Clinical Research Facility at Royal Brompton and Harefield hospitals has been awarded funding as part of a successful bid by Guy's and St Thomas' NHS Foundation Trust (GSTT).

The £11.8m funding from the National Institute for Health Research (NIHR) will be used to conduct ground-breaking clinical research studies across GSTT including facilities at Royal Brompton and Harefield hospitals, St Thomas' Hospital, Evelina London Children's Hospital and Guy's Hospital.

The facility at Royal Brompton Hospital was previously funded by the NIHR from 2010 through to 2017 before becoming an independent research facility. The facility will now benefit from an uplift in funding, making it possible it to expand on the heart and lung research projects which can take place there.

Dr Philip Molyneaux, director of the facility said: *"This NIHR award is the culmination of a lot of hard work from the whole research team. It is fantastic news for our patients and researchers. It will allow us to continue to provide world-class facilities and the expertise to support the testing and development of new therapies to help patients with heart and lung disease."*

Professor Martin Cowie, director of cardiovascular research, said: *"This is excellent news for patients taking part in ground-breaking studies in heart and lung disease – we will be able to improve facilities and help establish new approaches to diagnosis and treatment."*

RESEARCH SHOWS WHY SOME ATHLETES ARE MORE LIKELY TO DEVELOP RESPIRATORY TRACT INFECTIONS

New research at Royal Brompton and Harefield hospitals has helped shed light on the link between respiratory tract infections (RTI) and athlete performance.

RTIs are infections in parts of the body involved in breathing, including the sinuses, throat, airways and lungs, and are a common affliction in the general population.

However, compared to the wider population, some elite athletes have been shown to be more susceptible to developing RTIs, suffering from recurrent infections throughout the year.

Dr James Hull, respiratory consultant, has been working with the English Institute of Sport (EIS) for several years to try and help reduce the impact of respiratory illness on athletes preparing for the Olympic and Paralympic games.

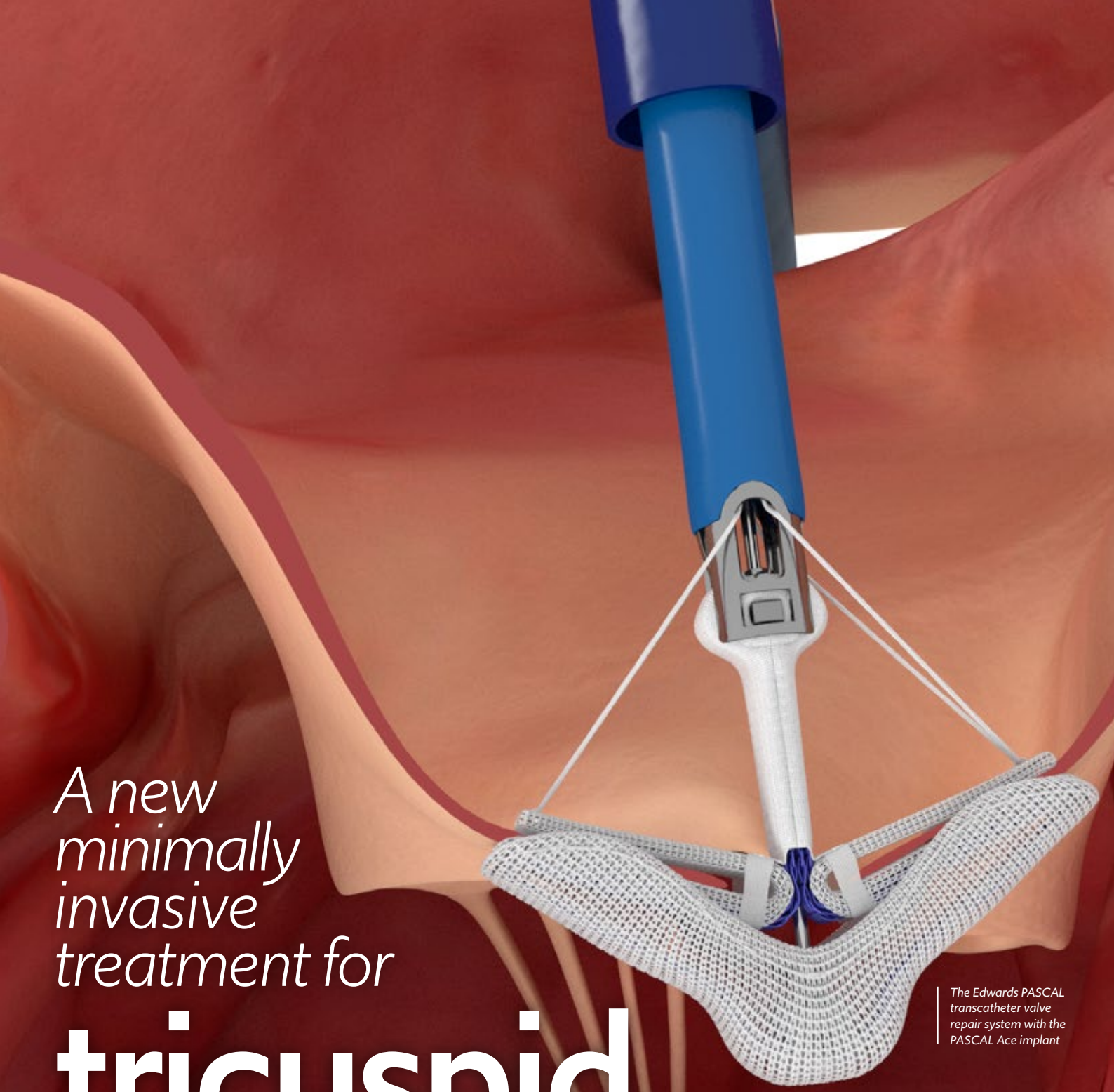
"We identified that RTI was the biggest medical issue for athletes in the EIS. Repeated episodes of RTI can have a devastating impact on an athlete's ability to train consistently; the key to success in competition," said Dr Hull.

In collaboration with the EIS, Dr Anand Shah, respiratory consultant, and Dr Hull, led a research study which aimed to characterise the immune factors, which make some elite athletes more susceptible to developing RTIs.

The results indicated that elite athletes with a higher risk of developing RTIs had fewer numbers of a particular type of white blood cell (known as T regulatory cells), an imbalance in their airway microbiome and specific differences in their metabolism, compared to the less susceptible elite athletes and healthy controls.

Dr Shah explained the importance of the study and mentioned that this *"is the largest study aiming to underpin the immune factors associated with susceptibility to respiratory infection in elite athletes, which is important for health and performance. We have for the first time, clearly shown the presence of a specific immune endotype in athletes susceptible to respiratory infection with a number of translationally relevant targets."*

Results from this study will make it easier for the development of targeted treatments for this group of athletes and extend the current understanding and insight into the implication of elite training and exercise on immune function.



The Edwards PASCAL transcatheter valve repair system with the PASCAL Ace implant

A new minimally invasive treatment for tricuspid regurgitation

Tricuspid regurgitation becomes increasingly common in those over 65, but corrective open-heart surgery is often considered too high-risk to perform in older patients. A new minimally invasive transcatheter approach is now available at our centre that enables us to target treatment directly to where it is needed and offers significant improvements to quality of life in patients where surgery is not possible.

THE BURDEN OF TRICUSPID REGURGITATION

Tricuspid regurgitation (TR) occurs when the tricuspid valve does not close sufficiently, allowing blood to flow backwards from the right ventricle into the right atrium.

This places substantial strain on the heart as it must work harder to pump blood forward towards the lungs. With time, this can lower cardiac output and places patients at increased risk of right-sided heart failure.

TR can result from a range of factors. This can include wear and tear due to age, enlargement of the right atrium due to atrial fibrillation, congenital heart disease, rheumatic disease, and structural damage from cardiac device implantation.

The most common form of TR is termed secondary (or functional). Secondary TR affects 80-90% of patients and is caused by changes to the right ventricle or distortion of the tricuspid valve leaflets, annulus, or chords. This typically occurs in patients with left-sided heart disease, pulmonary hypertension, atrial fibrillation or right ventricle dysfunction.

Generally, patients are classified as having mild, moderate, or severe TR and the overall prevalence varies widely in Europe, with figures ranging from 17%-66% (for all forms combined).

TR severity is associated with age and gender – the prevalence of moderate to severe TR rises from 1.1% in those aged 65 and over, to 4% in those aged 75 and over, with women having TR of greater severity when compared with men.

SYMPTOMS AND TREATMENT OPTIONS

During the early stages of TR, the condition is normally clinically silent. As such, TR is often an incidental finding during routine patient examinations, such as during echocardiography.

In the OxVALVE study in people aged 65 and over and diagnosed with valvular heart disease,

97.4% of patients with TR did not experience symptoms.

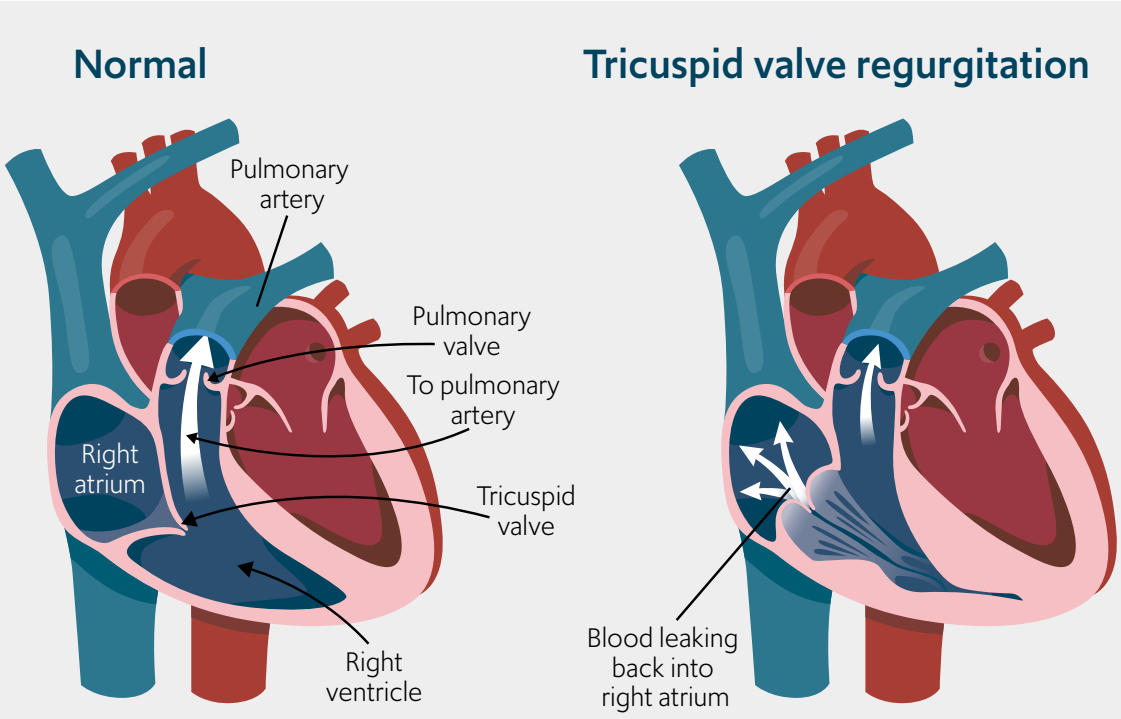
When symptoms are present, they can include fatigue, reduced ability to exercise, shortness of breath, dizziness, fainting, swelling of the legs or abdomen, atrial fibrillation, and/or kidney disease.

Survival rates decrease significantly with increasing TR severity, with available studies showing survival is approximately 26% at 15 years for those with moderate to severe TR.

Treatment options for medical management of TR are unfortunately limited and may not address the underlying pathology of the condition.

Corrective surgery is usually recommended in both symptomatic and asymptomatic patients with progressive right ventricular dilation and/or dysfunction. Despite this, however, open-heart tricuspid valve surgery is high risk for certain patient groups where it is associated with poor outcomes or mortality.

These high-risk patient groups include those that are older, have comorbidities and/or have advanced heart failure. An alternative, minimally invasive approach is therefore favourable for these patients.



Tricuspid regurgitation: The heart works harder to push blood forward.

A NEW MINIMALLY INVASIVE APPROACH

We now offer a transcatheter based approach to treating TR in patients where open-heart surgery is not possible.

To ensure that we can provide treatment that is unique to each patient and their tricuspid anatomy, our cardiology experts utilise two different clip-based platforms – the Abbott TriClip™ Transcatheter Tricuspid Valve Repair system and the Edwards PASCAL trancatheter repair system together with the PASCAL Ace implant system.

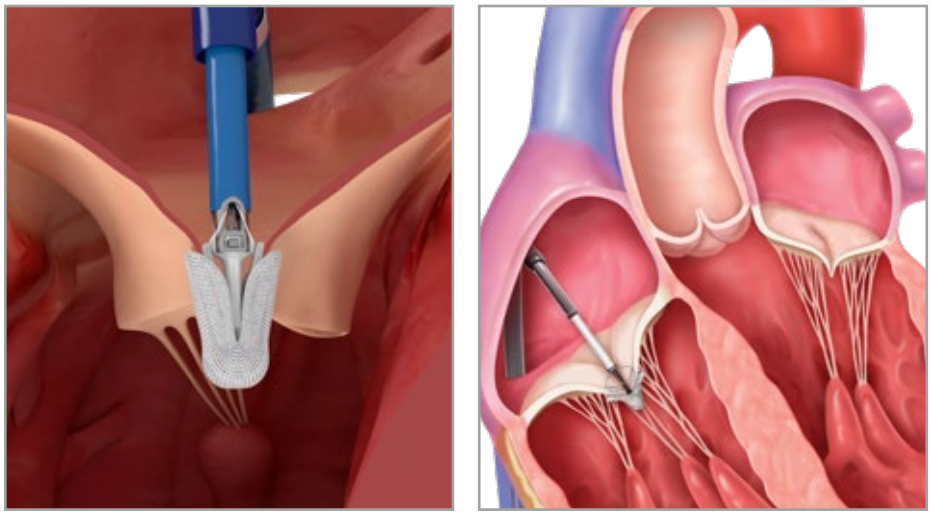
Both platforms enable our cardiologists to transeptally deliver the implant via a very small incision in the groin directly to the tricuspid valve leaflets without needing to stop the heart. This minimises the risk to the patient when compared to open heart surgery.

"Studies have shown excellent safety profiles for both platforms, with durable reductions in tricuspid regurgitation and improved quality of life for patients," explains our consultant interventional cardiologist, Dr Rob Smith, who performs this new specialist procedure at our centre.

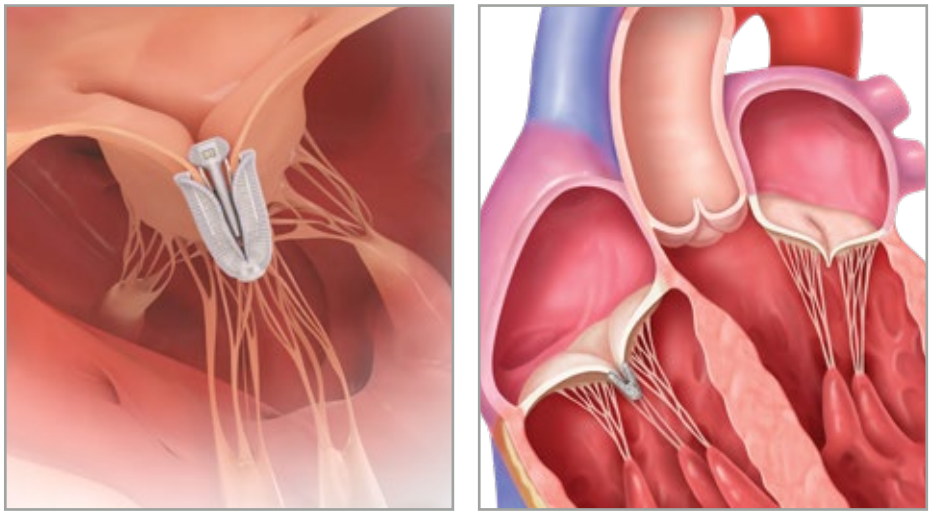
"We have seen impressive results in our patients who had no alternative surgical treatment option and hope to offer the procedure to more patients who are in a similar situation and may benefit."

Patients can expect to return home on the next or a couple of days after the procedure and most patients return to their regular routines shortly after.

Our centre is currently one of the few in the world that can offer this innovative new procedure and adds to our extensive expertise in minimally invasive heart valve repair, including the transcatheter edge-to-edge repair procedure to treat mitral regurgitation.



(Left) The Edwards PASCAL trancatheter valve repair system, with the PASCAL Ace implant and (Right) the Abbott TriClip Transcatheter Tricuspid Valve Repair system offer our cardiologists a wide range of implants for different tricuspid anatomies to ensure we can provide treatment uniquely tailored to each patient.



(Left) The Edwards PASCAL ACE implant and (Right) Abbott TriClip implant in situ holding the diseased tricuspid leaflets together to reduce tricuspid regurgitation.

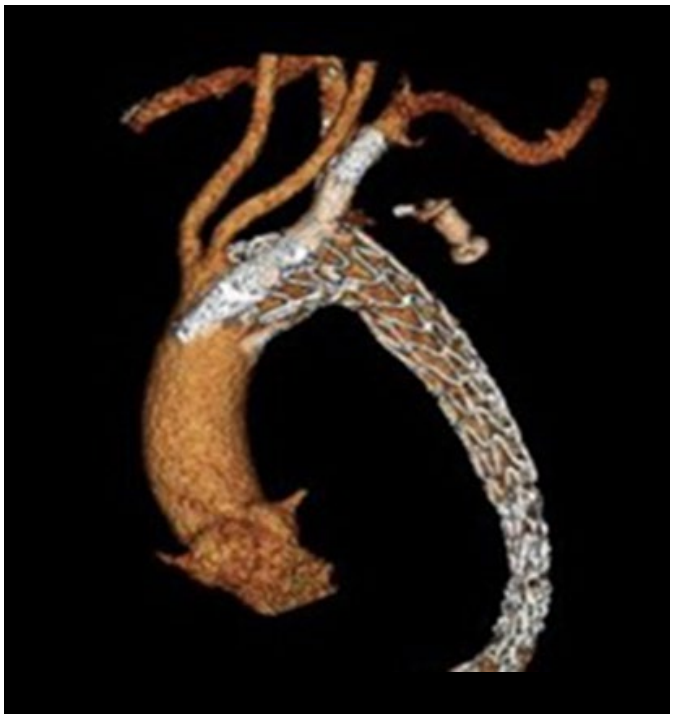
Dr Rob Smith
Consultant interventional cardiologist

Dr Smith specialises in minimally invasive procedures including coronary angioplasty, transcatheter mitral and tricuspid valve intervention, pacemakers, and alcohol septal ablation.

To find out more about our minimally invasive treatments for heart valve repair, please contact our team on **+44 (0)20 3131 0535** or email **privatepatients@rbht.nhs.uk**

FLIRT

A NEW MINIMALLY INVASIVE APPROACH TO AORTIC REPAIR



Our cardiologists have pioneered a new minimally invasive procedure to repair false lumen expansion in the aorta, called FLIRT. It is used to seal a de novo or residual tear in the aortic wall following previous intervention, using advanced imaging techniques to guide treatment directly to where it is needed.

COMPLICATIONS FOLLOWING AORTIC DISSECTION

Aortic dissection is a life-threatening condition, seen mainly in people aged 60 and over. It is caused by an intimal tear of the aortic wall, which can result in blood entering the inner layers and creating a false lumen.

Over time, the false lumen can expand and weaken the aortic wall, resulting in a rupture which can be fatal.

The TEVAR procedure has a success rate of >90% in treating aortic dissection

TEVAR IS THE RECOMMENDED TREATMENT

A minimally invasive procedure called TEVAR (Thoracic EndoVascular Aortic Repair) is the recommended treatment for aortic dissection. This involves inserting a stent graft at the point of the aortic dissection via a small incision in the leg.

The procedure repairs the aorta from within and allows blood to be redirected down the true lumen, removing pressure from the torn section of the aorta (figure 1).

The TEVAR procedure has a success rate of >90% in treating aortic dissection. It is also safer than the alternative treatment option of open-heart surgery, with a 4.9% lower risk of perioperative fatality (12.3% vs 17.2%).

USING FLIRT TO MANAGE DE NOVO AND RESIDUAL AORTIC TEARS

The success of endovascular management of aortic dissection with TEVAR depends on covering and bypassing the aortic tear to seal the false lumen.

In 2% of patients, the stent graft may move to re-expose the original entry tear or a new aortic tear may develop further down from the stent following a TEVAR intervention.

Unfortunately, this means blood can flow back into the false lumen, leading to expansion and increasing the risk of fatality once more.

Inserting an additional connecting stent graft with a further TEVAR procedure is not recommended because of the risk of side branch obstruction or spinal ischaemia. A focal approach is safer to occlude any re-entry tear, permitting the blood to continue flowing into the true lumen.

To overcome this problem, our cardiology experts have developed and pioneered an innovative and minimally invasive interventional procedure called FLIRT (False Lumen Intervention for the promotion of Remodelling and Thrombosis), that can seal a de novo or residual aortic tear.

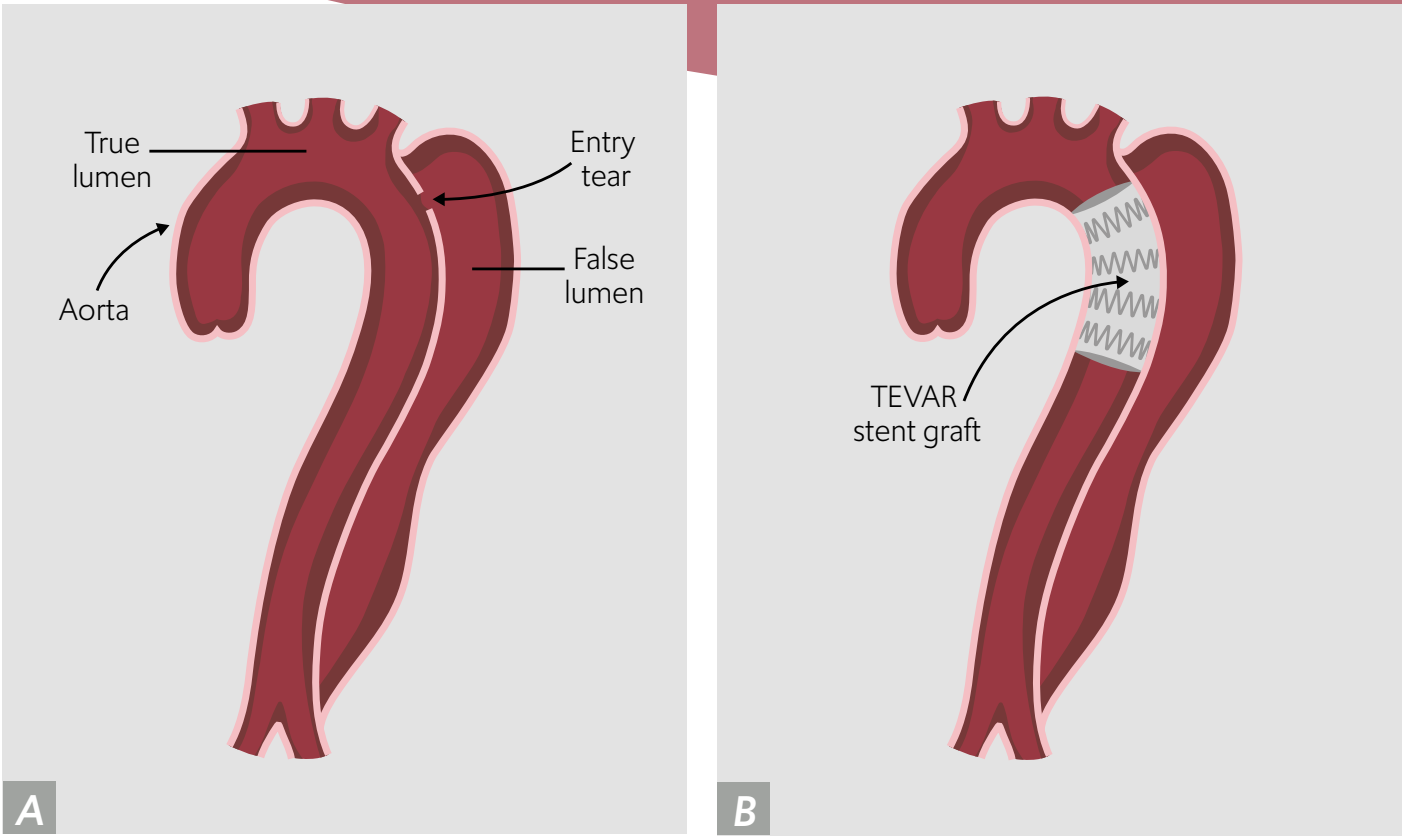


Figure 1: A) The entry tear of an aortic dissection can result in blood flowing in between the layers of the aortic wall, resulting in the development of a false lumen. B) TEVAR is the recommended minimally invasive treatment, positioning a stent graft to bypass the tear, enabling blood to be redirected through the true lumen.

WHAT DOES THE FLIRT PROCEDURE INVOLVE?

The FLIRT procedure (figure 2) uses advanced imaging techniques to guide a catheter and a wire (via a vein in the groin or arm) into the false lumen and between the delicate layers of the aortic wall to precisely seal the tear.

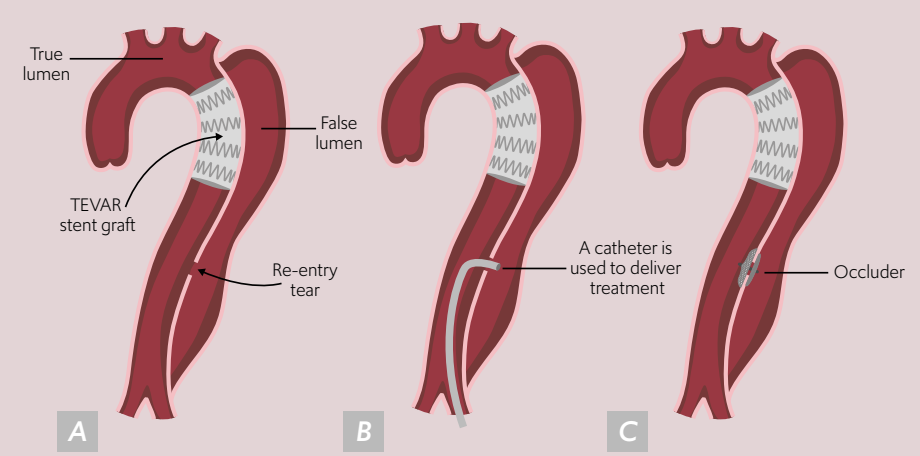
The method of sealing the tear will depend on the requirements of the patient and can include coils, occluders and vascular plugs.

The procedure prevents blood flow into and expansion of the false lumen and allows blood to flow correctly through the true lumen.

Our consultant cardiologist, Professor Christoph Nienaber, who pioneered the FLIRT and TEVAR procedures says:

"In essence, FLIRT is a new technique to restore blood flow to normal, when de novo or residual aortic tears emerge after a TEVAR procedure, and thereby stabilises the aorta."

Previously to this procedure, treatment was limited to medication to control a patient's blood pressure to lower the risk of fatality with repeat false lumen expansion. The FLIRT procedure offers a new minimally invasive treatment for the underlying problem.



Firgure 2: A) A re-entry tear to the false lumen can appear after a TEVAR procedure, leading to repeat false lumen expansion. B) The FLIRT procedure: A catheter is used to precisely target the tear leading into the false lumen, C) where an occluder is delivered to isolate the communication between the true and false lumen and promote thrombosis in the false lumen.

A patient case study: CT scans demonstrating repeat entry of blood into the false lumen following a TEVAR procedure. A vascular plug has been used to isolate the communication between the false and true lumen.

PATIENT FOLLOW-UP IS ESSENTIAL

"As most people experiencing problems with the false lumen are asymptomatic in the beginning, it is essential to follow up all TEVAR patients with clinical visits and imaging," explains Professor Nienaber.

He estimates that two thirds of patients with this issue following a TEVAR procedure show no symptoms or very mild instances of tension, back pain or chest pain.

"It is best to get in to fix the problem as early as possible. If repeat false lumen expansion occurs, it is usually between three months and three years following a TEVAR procedure," says Professor Nienaber.

We have an aortopathy clinic at our hospitals where we see patients three months after the TEVAR procedure and then at annual intervals – with CT imaging each time. If we find there is blood flow into the false lumen and expansion, we can carry out the FLIRT procedure to rectify the problem.

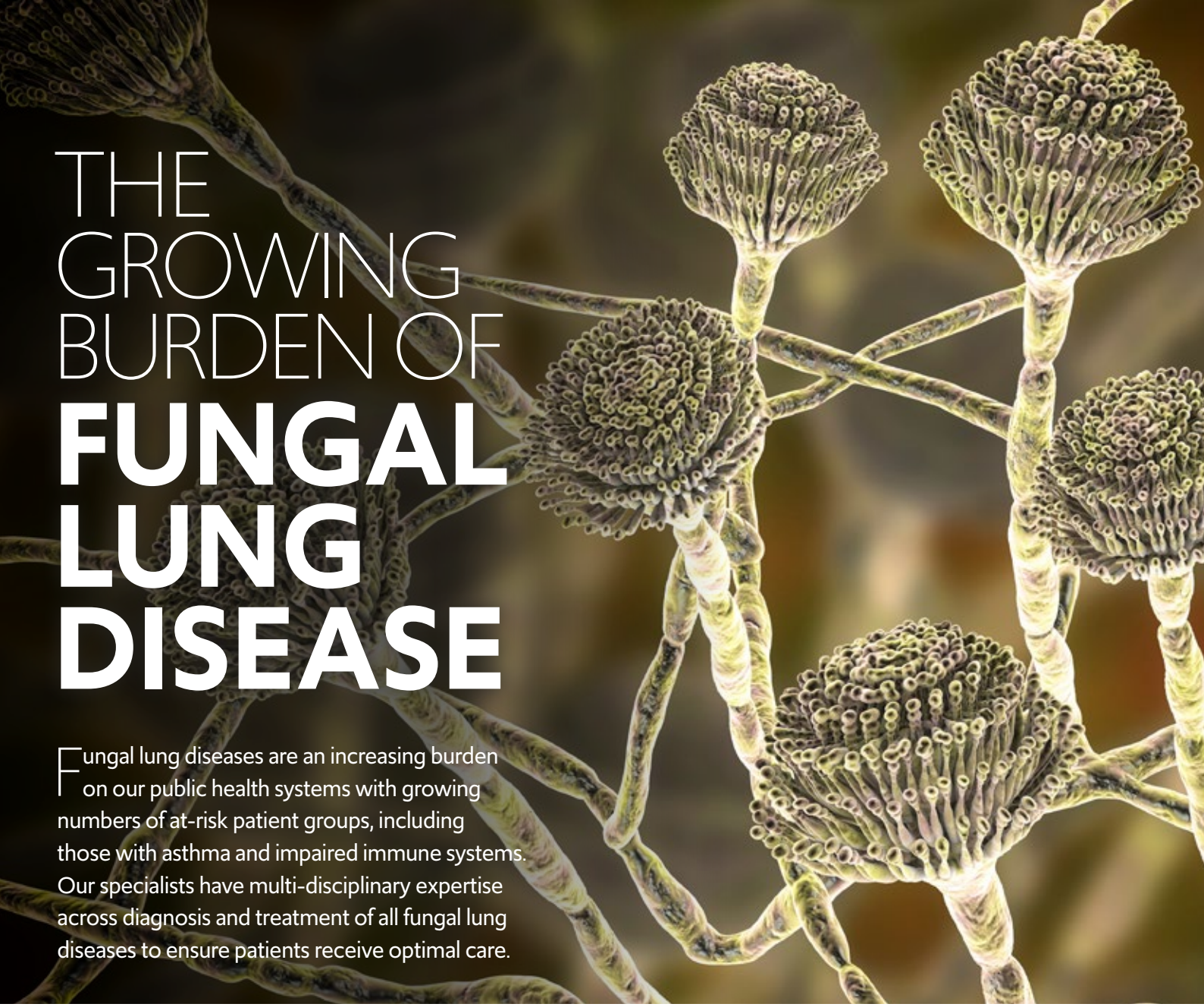
We monitor 300-400 patients each year and have identified 16 patients so far in need of the FLIRT procedure. All procedures were successfully completed with no complications.

Professor Christoph Nienaber
Consultant Cardiologist

Professor Nienaber specialises in the diagnosis and interventional treatment of aortic disease and conditions. He helped develop both the pioneering TEVAR and FLIRT minimally invasive procedures aimed at repairing aortic dissection.*

To find out more about the FLIRT procedure or to refer a patient, please contact our team on **+44 (0)20 3131 0535** or email **privatepatients@rbht.nhs.uk**

* *1. Yuan, X., Mitsis, A., Semple, T., Castro Verdes, M., Cambronero-Cortinas, E., Tang, Y. and Nienaber, C.A. (2018). False lumen intervention to promote remodelling and thrombosis-The FLIRT concept in aortic dissection. Catheterization and Cardiovascular Interventions: Official Journal of the Society for Cardiac Angiography & Interventions, [online] 92(4). pp.732–740. doi:10.1002/ccd.27599. 2. Nienaber, C.A., Fattori, R., Lund, G., Dieckmann, C., Wolf, W., von Kodolitsch, Y., Nicolas, V. and Pierangeli, A. (1999). Nonsurgical Reconstruction of Thoracic Aortic Dissection by Stent–Graft Placement. New England Journal of Medicine, 340(20), pp.1539–1545. doi:10.1056/nejm199905203402003.*



THE GROWING BURDEN OF **FUNGAL LUNG DISEASE**

Fungal lung diseases are an increasing burden on our public health systems with growing numbers of at-risk patient groups, including those with asthma and impaired immune systems. Our specialists have multi-disciplinary expertise across diagnosis and treatment of all fungal lung diseases to ensure patients receive optimal care.

FUNGAL LUNG DISEASE: A GROWING BURDEN

Fungi can cause lung disease through two mechanisms – by triggering an immunological reaction (e.g. asthma due to fungal sensitivity) or by direct infection of lung tissue.

Although fungal lung infections rarely occur in healthy people, they can result in life-threatening invasive disease in patients with an impaired immune system. These include cancer patients undergoing chemotherapy, or those taking immunomodulating drugs for a solid organ transplant or autoimmune condition. Underlying respiratory conditions can also increase the risk of chronic fungal infection and allergy such as COPD, asthma, bronchiectasis (including cystic fibrosis).

Unfortunately, the populations of these at-risk patient groups are growing, meaning that fungal lung diseases will place an increasing burden on public health systems.

ASTHMA AND HYPERSENSITIVITY TO FUNGI

Sensitisation to fungi is associated with greater severity of asthma – it is estimated that up to 50% of adults with asthma referred to secondary care have fungal sensitisation.

This has led to the definition of a relatively new phenotype of asthma, called severe asthma with fungal sensitisation (SAFS). This condition is diagnosed as severe (poorly controlled) asthma in addition to a positive allergy test for fungal sensitisation.

Allergic bronchopulmonary aspergillosis (ABPA) is a rare and distinct condition to SAFS, affecting 1% of patients with asthma and 5-10% of those with cystic fibrosis (CF). Diagnosis is based on the worsening of underlying asthma or CF, with consistent radiology and positive allergy tests to *Aspergillus* spp.

Recent studies show a promising role of antifungals in treating SAFS and ABPA patients, with large improvements to quality of life reported in 60% of patients with SAFS.

"Uncontrolled fungal allergy or infection can lead to a great reduction in quality of life. It is therefore important to rule out pulmonary hypersensitivity to fungi and presence of fungal infection in patients with lung disease to ensure we develop the best treatment plan for them," explains our consultant respiratory physician, Dr Anand Shah.

ASPERGILLOSIS: THE MOST COMMON FUNGAL LUNG INFECTION

Aspergillosis can present in different forms depending on the underlying health of the patient and comorbidities.

Chronic pulmonary aspergillosis is characterised by cavitation and usually affects patients with underlying pulmonary conditions such as COPD, or those with common immunosuppressive conditions like diabetes.

The disease usually presents with a prolonged and relapsing cough, dyspnoea, and weight loss. Acute symptoms may include haemoptysis

and pulmonary haemorrhage, particularly if an aspergilloma is present. Due the relapsing nature of the condition, it can be challenging to treat.

In addition to its association with chronic pulmonary aspergillosis, an aspergilloma can develop in the lungs following a cavity caused by previous infection with TB, pulmonary sarcoidosis, COPD or other lung disease causing cavitation.

Haemoptysis can be present in up to 60% of patients with an aspergilloma and be life-threatening. Presentation with cough and fever is not frequently observed and patients may be asymptomatic, with diagnosis confirmed incidentally with a chest X-ray. Lung resection may need to be considered if patients become symptomatic and antifungal therapy does not work.

Invasive aspergillosis is a disseminated form of the infection affecting significantly immunocompromised patients – for example, it affects an estimated 10-20% of patients after a bone marrow transplant.

Although it often starts in the lung, it can involve any other organ and/or tissue through haematogenous spread, including the brain. Due to this, it has a high mortality rate of 30-95%.

"Invasive aspergillosis can be a difficult condition to diagnose, and symptoms can include fever, cough, and shortness of breath. If it is suspected, a CT assessment with a specialist cardiothoracic radiologist is likely to be needed to spot the subtle indicators in the lungs," explains our infectious diseases physician, Professor Darius Armstrong-James.

MONITORING ANTIFUNGAL RESISTANCE

The only oral antifungal treatments active against *Aspergillus* species are the triazole group (which include voriconazole and itraconazole) and are used as first-line therapies.

Unfortunately, resistance to azole antifungal drugs is growing and it is estimated that up to 19% of *Aspergillus* infections are azole resistant.

Antifungal resistance is driven in two main ways. The first way it can arise is in patients with chronic aspergillosis where the infection spontaneously acquires resistance with prolonged use of azole drugs.

The second driver is agriculture and the widespread use of azole-based pesticides that are similar to triazole drugs. Genetic testing has determined that patients can be infected with azole-resistant *Aspergillus* strains from the environment which have acquired resistance in this way.

Young patients with cystic fibrosis are at risk of aspergillosis

Antifungal resistance greatly influences patient outcomes. A recent cohort study showed that mortality in patients with voriconazole-resistant invasive aspergillosis was 20-30% higher than with voriconazole-susceptible disease.

Although slightly less effective, alternative treatments for pan-azole resistant infections are available, including intravenous amphotericin B.

"Drug sensitivity testing and ongoing therapeutic drug monitoring are an important part of treating aspergillosis to identify resistance as soon as possible and ensure the best outcomes – particularly in those receiving long-term antifungal therapy," explains Dr Shah.

MULTI-DISCIPLINARY EXPERTISE NEEDED FOR ACCURATE DIAGNOSIS AND MONITORING

"Royal Brompton and Harefield hospitals is the largest centre for fungal lung diseases in south England and we see over 600 patients a year. Our multi-disciplinary expertise enables us to quickly and accurately diagnose these conditions which can otherwise be challenging and require specialist diagnostic tools," explains Dr Shah.

Professor Armstrong-James adds:
"Our interventional radiology consultants can help discern even the most subtle signs of fungal lung disease and work alongside our expert histopathologists to detect pathogens not often observed at other centres."

"Our combined expertise enables us to detect antifungal resistance at the earliest stages to deliver an optimal treatment plan tailored to each patient. We also have some of the world's leading cardiothoracic surgeons should surgery be required, as may be the case for an aspergilloma."

Dr Shah is an expert in fungal lung disease, as well as respiratory infection including bronchiectasis, CF and general respiratory diseases. Professor Armstrong-James' expertise extends to all types of fungal infections, as well as viral, bacterial and parasitic infections. He also leads the diagnostic fungal service at Royal Brompton Hospital, with highly specialised services and tests for diagnosis of fungal lung infection.

Dr Shah and Professor Armstrong-James are both key academic researchers in fungal lung disease, with a broad portfolio of basic and clinical research through both Imperial College London and King's College London.

Dr Anand Shah
Consultant respiratory physician

Dr Shah specialises in fungal lung disease, cystic fibrosis, bronchiectasis, primary ciliary dyskinesia and general respiratory disease.

Professor Darius Armstrong-James
Infectious diseases physician

Professor Armstrong-James specialises in general medicine and infectious diseases, including fungal diseases, chronic viral infections, bacterial infections, worm and parasitic infections. He has a specific interest in respiratory infection and immunology.

To find out more about our expertise in fungal lung diseases or to refer a patient, please contact our team on **+44 (0)20 3131 0535** or email **privatepatients@rbht.nhs.uk**

Pre-conception heart check:

Planning for a high-risk pregnancy

Supporting mother and baby through a high-risk pregnancy takes a holistic approach, managing health from pre-conception through to post birth. Our pre-conception heart check aims to diagnose the presence or risk of a heart condition so that we may manage it for a safer pregnancy.

CARDIOVASCULAR DISEASE AND HIGH-RISK PREGNANCIES

Due to delayed motherhood, the number of pregnant women with cardiovascular disease is on the rise, with maternal heart disease affecting up to 4% of pregnancies and making them high risk.

Cardiovascular disease is one of the main causes of pregnancy-related mortality, with aortic dissection and cardiomyopathies being some of the main reasons.

Pregnancies at an older age can increase the risk of acquiring heart disease, as well as experiencing perinatal complications, such as gestational diabetes.

Further complications of a high-risk pregnancy due to a heart condition include premature delivery, preeclampsia and increased risk of the foetus inheriting cardiovascular conditions.

High-risk pregnancies of this nature are best managed from the beginning, before conception, to assess the risk of developing heart disease or identify its presence for the safest possible pregnancy throughout.

OUR PRE-CONCEPTION HEART CHECK AIMS FOR A SAFER PREGNANCY

Our pre-conception heart check is specifically designed to manage a high-risk pregnancy. Dr Claudia Montanaro, consultant cardiologist with maternal cardiology expertise at Royal Brompton Hospital, explains, *"We aim to provide support for the pregnancy, whether we are diagnosing the presence or risk of developing heart disease, or treating it".*

Our high-risk pregnancy clinicians will consider risk factors in a patient's past and current medical state, regardless of whether they have a diagnosed heart condition or not, and monitor symptoms throughout the pregnancy.

Dr Montanaro continues: *"For pregnant women with pre-existing heart conditions, the most common complications are arrhythmias. Having a diagnosed heart condition allows us to help our patients plan their pregnancies and prevent or manage symptoms, but unfortunately, some women aren't aware they have a heart condition until symptoms arise during or after pregnancy."*

WHEN TO REFER TO US

Patients with an underlying heart condition do not always adapt well to the physiological changes during pregnancy and are therefore more prone to developing adverse outcomes such as arrhythmias.

To help us identify patients with undiagnosed heart conditions, there are factors which are indicative of potential cardiovascular problems. Professor Mark Johnson, one of our partner consultant obstetricians, explains: *"While our pre-conception heart check is a specialist service, we must consider all medical problems which may arise during and even after pregnancy."*

We therefore encourage referrals to our pre-conception heart check based on the following risks:

- A history, or family history, of cardiac disease (ie congenital heart disease, hypertension, valve disease, cardiomyopathy, arrythmias, etc).
- Metabolic disease, such as diabetes.
- Obesity or poor nutrition.
- A history of malignancy, as chemotherapy can affect the heart.
- A history of preeclampsia.
- An increased risk of pregnancy because of the woman's age.

PLANNING A PREGNANCY: PRE-CONCEPTION HEART CHECK

"If a pregnancy is classified as high risk, it doesn't automatically mean that something will go wrong. It just means we need to work with the patient more closely to monitor and manage potential risks," explains Dr Montanaro.

We provide an individualised model of care for each patient but there are specific diagnostics we commonly perform for each patient referred to us.

Professor Wei Li, our adult congenital heart disease and echocardiography specialist at Royal Brompton Hospital explains, *"Once the patient is referred to us, we are already aware of the predominant symptom or concern, whether it's palpitations or breathlessness. We can immediately perform an echo or ECG, which are safe tools for diagnosing underlying heart problems.*

"These diagnostic methods can help us rule anything out and provide reassurance or identify any concerns that need to be monitored and managed."

Following this assessment, any further specialised heart and obstetrics investigations will depend on the patient and their individual needs. We will work with our multi-disciplinary team across our specialist centres to ensure a safe pregnancy and delivery.

MANAGING RISK THROUGHOUT PREGNANCY AND POST BIRTH

Our high-risk pregnancy clinicians aim to support women's heart health after birth, too. While uncommon, conditions like peripartum cardiomyopathy can arise, especially in women over the age of 30 . Patients with this condition may present with fatigue, low blood pressure, shortness of breath and palpitations, so they will be referred to us for further testing.

We can then run diagnostics to specifically monitor and care for the heart and consult with other experts at the hospital to provide an individualised catalogue of care. While we can identify potential risk factors at a pre-conception screening, postpartum cardiomyopathy tends to occur in the last month of pregnancy and up to five months after birth. That is why it's so important to follow the patient throughout the entire process.

Dr Claudia Montanaro
Consultant cardiologist

Dr Claudia Montanaro is a consultant cardiologist who specialises in congenital heart disease. She has a special interest in heart disease in pregnancy and valve disease. She leads the Univentricular (Fontan) adult service at Royal Brompton Hospital.

Professor Michael Gatzoulis
Consultant cardiologist

Professor Michael Gatzoulis is a consultant cardiologist at Royal Brompton Hospital. He has a special interest in congenital heart disease, pulmonary arterial hypertension and heart disease in pregnancy.

Professor Mark Johnson
Consultant obstetrician

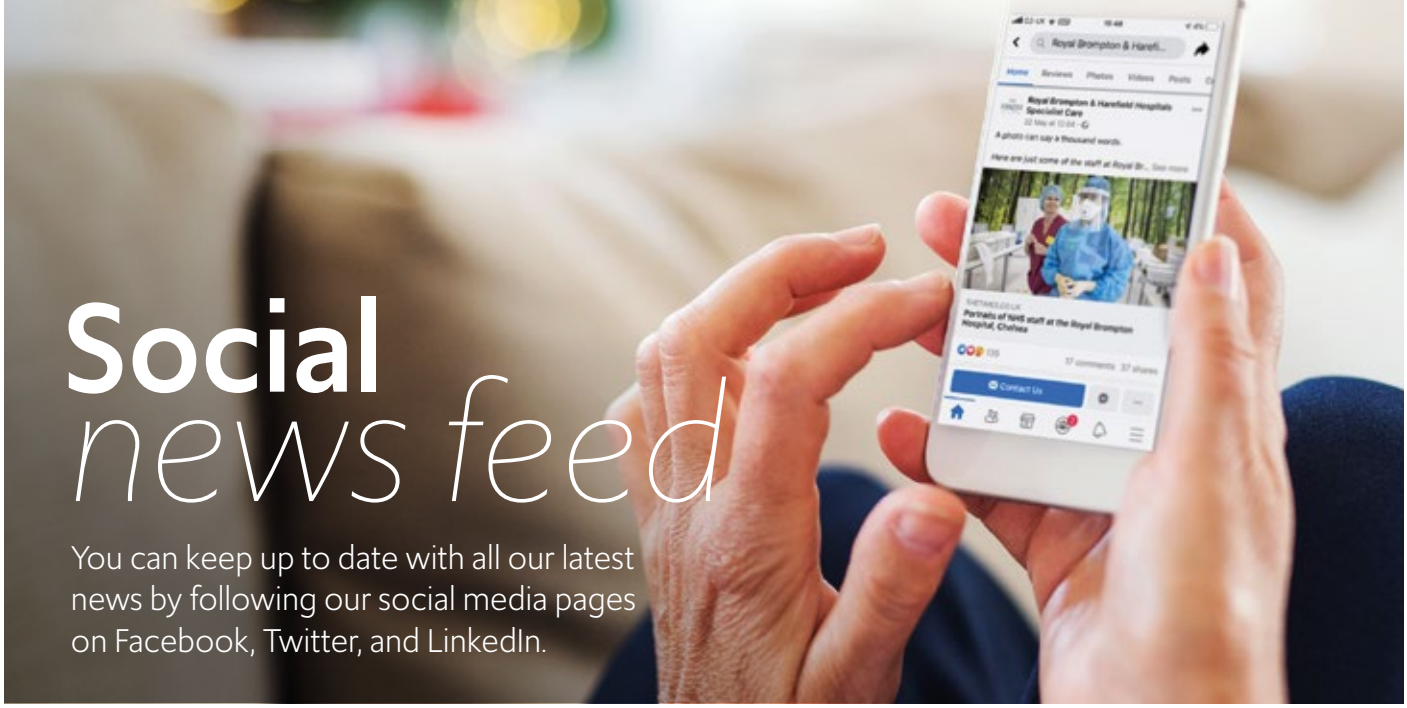
Professor Mark Johnson specialises in endocrinology and diabetes at Chelsea and Westminster Hospital NHS Foundation Trust. He has a particular interest in medical disorders of pregnancy, providing care throughout simple and complex pregnancy cases.

Professor Wei Li
Consultant cardiologist

Professor Wei Li is a consultant cardiologist who specialises in adult congenital heart disease and echocardiography. She is the clinical lead for echocardiography in adult congenital heart disease and pulmonary hypertension at Royal Brompton Hospital.

We also work with Dr Roshni Patel, partner consultant high-risk obstetrician, Chelsea and Westminster Hospital NHS Foundation Trust.

To find out more about our specialist pre-conception and cardio-obstetric services and treatments, please contact us 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, and LinkedIn.

World Heart Day 2022

At our hospitals, Royal Brompton & Harefield Hospitals Specialist Care, patients of all ages can now benefit from a new totally endoscopic surgical approach (keyhole surgery) used for mitral valve repair and aortic valve replacement, with several benefits over open-heart surgery.

Consultant cardiac surgeon, Mr Bahrami Toufan, explains, "Because the chest is not opened, patients can breathe faster, mobilise quicker and recover quicker. This technique is a game-changer for patients with reduced risk of infection, minimal scarring and reduced length of stay in hospital."

Read more on

★★★★★

The cardiac team at the Royal Brompton are the nicest and most empathetic people.

doctify

Providing the empathy and care our patients deserve

Our cardiologists are experts in heart health and take the time to understand the needs of patients so they can provide the best possible care.

This feedback is from one of our private patients who was treated for a heart rhythm problem – we're really pleased they had a nice experience with us.

Read more on

LaingBuisson awards finalists

We're really pleased to announce that we were nominated for a 'Healthcare Outcomes' award for our lung cancer services.

Our consultants are experts in lung cancer care and continuously research new treatments to improve healthcare outcomes.

This nomination is for our lung tumour ablation service at Royal Brompton Hospital, led by Dr Carole Ridge, our consultant cardiothoracic and interventional radiologist.

Read more on

★★★★★

Treated like royalty. Amazing reception team. Thank you for your attentive care. You went above and beyond.

doctify

Treating our patients like royalty

Our expert cardiologists consider the individual needs of every patient for the best possible outcome.

We enjoy hearing about our patients' experiences and are pleased to share this story from one of our patients.

Read more on

Can I reduce my risk of vascular dementia

Vascular dementia is the second most common form of dementia after Alzheimer's disease.

It can lead to memory loss and difficulty with thinking and problem solving, greatly impacting the lives of those affected.

It is caused by reduced blood flow to the brain, such as what happens during a stroke.

Thankfully, there are things patients can do to lower their risk of getting vascular dementia and a heart screen can help identify if you are at risk.

Read more on

Nuclear cardiology webinar

Register to our live webinar: #NuclearCardiology - What can it do for patients? Dr Wechalekar will discuss #cardiac imaging including ischaemia, infection, inflammation & myocardial infiltrative disorders.

Read more on

RB&HH
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Sleep is vital to your patient's mental and physical health.

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- sleep apnoea
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*In-person consultations are also available if a patient chooses. †For a home sleep study at 77 Wimple Street.

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Royal Brompton & Harefield Hospitals Specialist Care

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