Case Notes

News · Case Studies · Insight

From Royal Brompton & Harefield Hospitals · London

Summer 2016

RB&HH
SPECIALIST CARE

Welcome to the Summer 2016 edition of *Case Notes*

David Shrimpton
Private Patients' Managing Director
RB&HH Specialist Care

In this issue we reveal the first look at 77 Wimpole Street – our new Outpatients and Diagnostics, opening this July in the Harley Street Medical Area. Our service has rapidly expanded over the past few years requiring us to find an additional outpatients location. Working with our referrers we also identified the need for rapid and advanced diagnostics – and we have delivered on both accounts. Our new facility not only boasts a comprehensive diagnostic suite but also London's only PET scanner offering Rubidium cardiac imaging. You'll find a full overview of the facilities on page 5 along with an article on our cardiac PET service.

We will also be extending our Inherited Cardiac Conditions clinics to 77 Wimpole Street. Working with our leading consultants in this area we have compiled some key information to help you understand the benefits our clinics offer and key signs to look out for when referring for a suspected Inherited Cardiac Condition.

Furthermore, to keep you updated on the latest devices and procedures Royal Brompton & Harefield Hospital Specialist Care can provide don't miss the articles on; Melody Valve – for treating pulmonary valve function; Nanostim – a new leadless pacemaker that brings some excellent patient benefits and an update on Aortic Valve Replacement.

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RB&HH
SPECIALIST CARE

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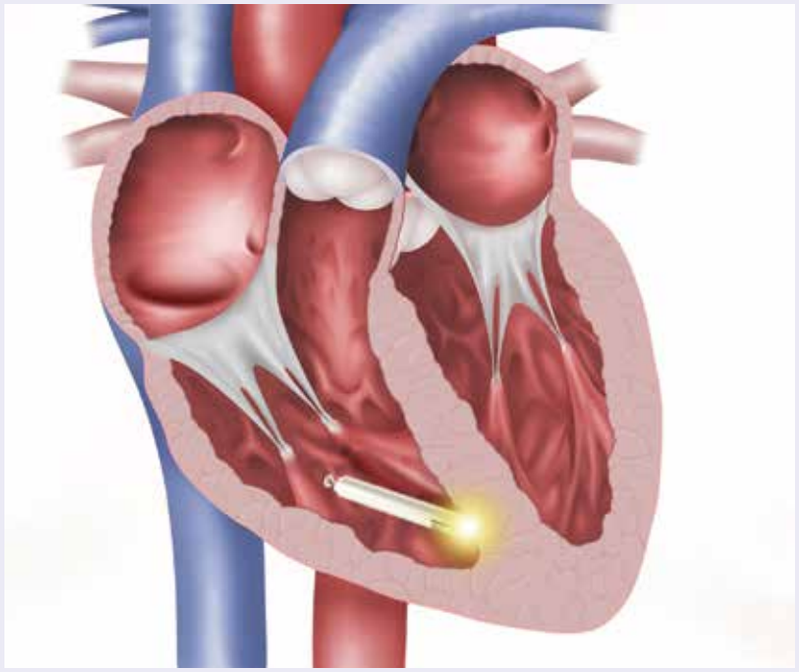

What's new at RB&HH?

Pioneering Surgery Performed at Arab Health Conference

Royal Brompton Hospital (RBH) surgeon Mr Ulrich Rosendahl performed the ExoVasc® Personalised External Aortic Root Support (PEARS) procedure for the first time in the Middle East this January, at Arab Health Conference 2016. The procedure is a new conservative treatment to manage aortic dilation and dissection in patients with Marfan and other syndromes. This is a less invasive approach compared to conventional treatments for aortic dilation, so the simulation received both national and regional coverage in the UAE.

Percutaneous Coronary Interventions Workshop held in Kuwait

Over the past year, RB&HH Specialist Care has been collaborating with the Sabah Al Ahmad Cardiac Centre (SAAC) in Kuwait to arrange knowledge sharing opportunities with our consultants – to lecture and perform workshops promoting clinical expertise. In March, Prof Carlo Di Mario made a short visit to SAAC in Kuwait where he ran a full outpatient clinic and performed a number of complex PCI procedures. He said : "I welcome the opportunity to attend the Sabah Al-Ahmad Cardiac Centre and share my knowledge. The hospital has excellent facilities and the level of patient-focused care is exceptional. I hope this exchange of knowledge is one that we will continue to develop".

Sharing our expertise at Gulf Thoracic 2016

Three of RB&HH's specialist consultants – Dr Pallav Shah, Ms Emma Beddow and Dr James Hull – presented at the Dubai conference this March. The team promoted RB&HH's leading expertise in treating thoracic conditions covering areas including lung cancer screening, surgical treatments for lung cancer and Dysponea. In addition, registrar thoracic surgeon Henrietta Wilson and Ms Emma Beddow's abstract 'Surgical Management of Cancer: A 10 years study' was awarded first place by the Annuals of Thoracic Medicine.

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Our new consultants

Dr Laura Price
Consultant Respiratory Physician

Dr Laura Price joined RBH in 2014 and is an honorary clinical senior lecturer at the National Heart and Lung Institute (NHLI), Imperial College London.

Dr Price is an integral member of the National Pulmonary Hypertension Service at RBH. In this role, she consults with patients who have this condition and other pulmonary vascular diseases including follow up after a pulmonary embolism. She runs outpatient pulmonary hypertension clinics, and supervises care of inpatients with the condition with emergencies relating to pulmonary hypertension or co-existing medical conditions.

Dr Price's particular areas of research interest are pulmonary hypertension in lung diseases, notably interstitial lung disease, chronic obstructive pulmonary disease (COPD) and sleep disorders.

Dr James Ware
Consultant Cardiologist

Dr James Ware is a consultant cardiologist at RBH and a clinical senior lecturer in genomic medicine at Imperial College London. Dr Ware's primary expertise is in cardiovascular genetics. His clinical interests focus on the management of inherited cardiac conditions (ICCs) – particularly cardiomyopathies and channelopathies – and the prevention of sudden cardiac death.

As a researcher, Dr Ware studies ICCs, the clinical interpretation of genomes and genetic variation more broadly, and the application of genome-stratified medicine. He is closely involved with the Clinical Genome Resource (cardiovascular domain expert panel) and Genomics England (GeCIP cardiovascular domain), alongside other projects.

Royal Brompton & Harefield Hospitals Specialist Care Case Notes *Summer 2016*

RESEARCH ROUND-UP

RB&HH lead the way with innovative procedures and treatments to treat heart and lung disease. Here we bring you the latest research from our team of expert consultants.

> Our findings raise the possibility that cancer itself – and not just the drugs used to treat it – may have an adverse impact on heart function

CANCER MAY ALSO LEAD TO REDUCED HEART FUNCTION

The findings of new research carried out by experts at Royal Brompton Hospital suggest a possible link between cancer and a decline in heart function.

Whilst it is widely accepted that some common cancer treatments, particularly chemotherapy and drugs such as trastuzumab, are potentially toxic to the heart, the results of this new study – presented at EuroEcho-Imaging 2015 in Seville – raise the possibility that cancer itself may be responsible for causing damage to the heart, regardless of exposure to any cancer treatment.

In this new study, echocardiography was used to consider a relatively new, more subtle measurement of heart muscle function, known as strain. A reduction in strain is often an early indication that the heart muscle fibres are not contracting well and may occur before any notable change in ejection fraction (EF). Strain has previously been shown to be an early predictor of future decline in heart function for cancer patients receiving certain chemotherapy agents.

The researchers compared strain in 79 cancer patients. All were known to have a normal EF (55 per cent or more) and no pre-existing heart condition. A further 20 healthy individuals were matched to the cancer group for age and gender.

The findings showed that overall the cancer patients had reduced strain measurements compared with the healthy controls. The study then went a step further, looking at the strain of patients who had been exposed to cancer drug therapies (43) and patients with as yet untreated cancer (36). There was no significant difference between strain in both groups of cancer patients.

Dr Rajdeep Khattar, consultant cardiologist at Royal Brompton Hospital and one of the lead researchers in this study, said:

"Our findings raise the possibility that cancer itself – and not just the drugs used to treat it – may have an adverse impact on heart function. Although a relatively small-scale study, the results show that more research is now needed to further investigate this link. If proven, it could change the way cancer patients are cared for in the future with regards to protecting their heart health".

Based in the renowned Harley Street Medical Area, our new centre will deliver outpatient and diagnostic care for those patients that present with complex diseases that impact their cardiovascular or respiratory health.

Our Royal Brompton & Harefield Hospital consultants will work closely with an extended multidisciplinary team of clinical professionals to ensure a comprehensive and holistic patient journey.

At 77 Wimpole Street we will provide our patients with an outstanding healthcare experience. Great care has been taken to ensure our service offers the latest diagnostic capabilities in an environment that is relaxing and comfortable for the patient.

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

Below are the services that will be available for same-day or short-notice appointments:

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

Our administrative team will play a key role in ensuring the experience is seamless, for both referrers and patients – from registration and consultation to diagnostic tests and treatment.

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

We look forward to working closely with the medical professionals in the area and will provide a friendly and professional approach to provide the services and care they require".

Consultants extending their practice to the new facilities are excited about the opening and the opportunity to offer their expertise to more patients.

Respiratory Consultant, Dr Pallav Shah notes "At RB&HH Outpatients and Diagnostics we will have the ability to perform full lung function tests and imaging for rapid diagnosis. The new facility will give respiratory patients greater choice and access to specialist consultants – which means we can help get them on the best treatment path as early as possible. It will also facilitate a one-step approach with diagnostic and consultation services all under one roof".

Consultant Cardiologist, Dr Alexander Lyons says:

"I am passionate about helping those with heart failure – improving their quality and length of life. Improved detection and early treatment make a significant difference in this condition and with the new centre at 77 Wimpole Street I will be able to extend my practice to reach even more patients, providing them with a rapid diagnosis and a comprehensive treatment plan".

To find out more, including our diagnostic referral forms and booking information, please visit our website.

The bright and spacious waiting room at 77 Wimpole Street.

KEY SERVICES

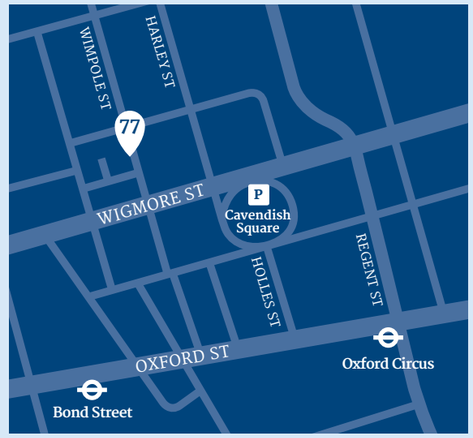
DIAGNOSTIC IMAGING

Featuring one of only two PET-CT centres in the UK offering Rubidium cardiac imaging, the diagnostic imaging department will provide rapid access appointments across all imaging services. Leading reporters from the Trust will provide their expertise in reporting. To find out the advantages that PET-CT can offer for cardiac evaluations turn to **page 8**.

INHERITED CARDIAC CONDITIONS

RB&HH boasts the leading experts in this field. We offer a full diagnostic and treatment path for those with suspected Inherited Cardiac Conditions. To find out more on our ICC clinics turn to **page 10**.

CONTACT INFORMATION



Opening Hours
8am-9pm Mon-Fri, 8am-4.30pm Sat

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

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

CARDIAC POSITRON EMISSION TOMOGRAPHY

PET

The opening of 77 Wimpole Street brings another first for RB&HH – the ability to offer cutting edge PET-CT imaging.

The new PET-CT Suite.

THE KEY BENEFITS OF ^{82}RB PET:

1. **Short 1 hour protocol in total (stress + rest)**
2. **Reduced radiation to patients (approximately 1/4 of SPECT tracers)**
3. **Suitable for patients with high BMI (>35)**
4. **Absolute myocardial flow quantification**
5. **Imaging at peak of stress**
6. **Improved diagnostic accuracy**
7. **Valuable prognostic information**
8. **Ability to perform CTCA in same appointment**

As one of only two PET-CT scanners in the country offering Rubidium Cardiac PET, and the only in London, our Imaging Team will be able to offer complex cardiac diagnostics to our private and international patients.

Advanced Myocardial Perfusion Imaging with PET

PET is based on the detection of 2 identical 'coincident' photons emitted after injection of a specifically selected radiopharmaceutical which concentrates in the area of interest within the body.

Coincidence detection of photons creates distinct advantages for PET, including the ability to provide attenuation-corrected images in order to more accurately display information, thereby greatly increasing specificity. Coincidence detection also makes for high count sensitivity which increases reporter confidence.

Myocardial perfusion imaging (MPI) utilising the radiopharmaceutical Rubidium-82 is a highly sensitive method for mapping myocardial blood flow; this involves injection of 82Rb at rest and under pharmacological stress (hyperaemia).

^{82}Rb is a PET tracer with very short half-life of 75 seconds which allows the full procedure to be completed in less than an hour (an imaging time of about 30 min), as opposed to 4+ hours for routine SPECT imaging. This also contributes to a significant reduction in the radiation burden to patients, cutting the dose by up to a quarter.

Due to the diagnostic capability of the multislice CT scanner, patients can have a calcium score and high definition coronary angiography scan in the same appointment thereby offering increased diagnostic certainty with greatly improved sensitivity and specificity.

Which patients benefit most from ^{82}Rb PET imaging?

- Obese patients; where other imaging modalities may have reduced diagnostic accuracy, cardiac PET is a promising non-invasive modality offering good prognostic value.
- Where large breast attenuation is likely to degrade image quality.
- Advanced atherosclerosis; multi-vessel disease, haemodynamic significance of known disease.
- High risk demographics with early atherosclerosis.
- Suspected coronary disease in younger patients.
- Microvascular disease i.e. Syndrome X.

Dr Kshama Wechalekar
Dr Wechalekar leads the Wimpole Street PET and RBH specialist radionuclide imaging services for heart and lung imaging and is expert in myocardial perfusion imaging.

Why quantify flow?

Interpretation of SPECT and PET images is visual or semi-quantitative and based on relative uptake. Areas of the myocardium with the highest uptake are presumed to be supplied by unobstructed coronary arteries while those with decreased uptake during stress are assumed to be supplied by obstructed e.g. atherosclerotic arteries. Nonetheless, stenoses with luminal diameters around 50% may be undetected by this visual interpretation alone.

Moreover, patients with subclinical coronary ischemia or microvascular diffuse disease may present with only mildly heterogeneous or even homogeneous myocardial uptake and similarly in the situation of three-vessel coronary disease, a reduction of myocardial uptake may be balanced in all coronary arteries, resulting in a homogeneous left ventricle myocardium at stress. Each of these pathological variants could potentially lead to false negative results.

Measurements of absolute myocardial blood flow (MBF) in millilitre per gram per minute and myocardial flow reserve (MFR), which is the maximum increase in blood flow above the normal resting volume, help identify subclinical coronary ischemia by characterising extent and severity in multi-vessel disease. Furthermore, it has been clinically observed that the measurement of hyperaemic MBF and MFR with PET-CT may predict, better than other methods, the occurrence of hard cardiac events.

Myocardial hibernation imaging

Identification of viable myocardium is important when planning the strategy for revascularisation in patients with chronic ischaemic heart disease. Identifying and treating dysfunctional but vascularised, viable myocardium reduces patient morbidity and mortality.

18Flourine labelled Fleuro-deoxy-glucose (FDG) behaves as an analogue of glucose when in the body and concentrates in chronically ischaemic dysfunctional but viable myocardium. In conjunction with ^{82}Rb perfusion imaging, such pathology can be identified to plan the revascularisation strategy.

Confidence in the FDG identification method has only further grown following a large meta-analysis of observational studies looking at predicting the recovery of cardiac function following imaging and subsequent advised therapy. Results showed that FDG PET was the most sensitive method for identifying hibernating myocardium and hence considered the 'gold standard'.

Infection and Inflammation

PET-CT can also be used to identify areas within tissue which are affected by inflammatory and infectious processes; for example it is very valuable in the diagnosis, management and monitoring treatment response in cardiac sarcoidosis patients.

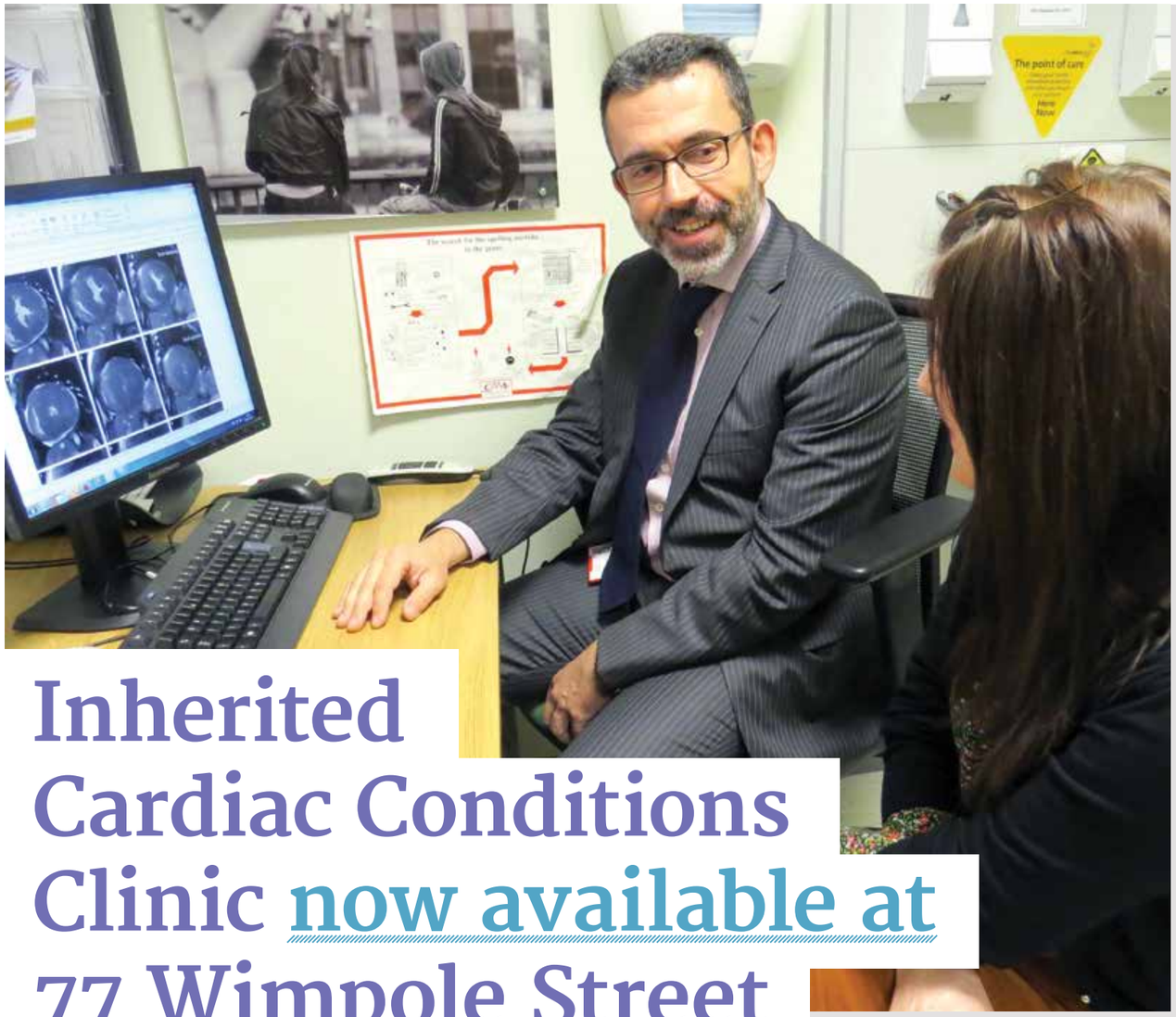
Sarcoidosis involving the cardiac tissue leads to arrhythmias which can potentially be fatal but FDG imaging can be used to identify these areas of inflammatory cardiac involvement so that they can be treated accordingly.

In fact, the recent Heart Rhythm Society consensus statement recommends screening for cardiac sarcoidosis using PET or MRI, for example in young patients with unexplained second degree heart block.

FDG imaging is also proving useful in other difficult to diagnose cardiovascular inflammatory conditions such as Giant cell vasculitis and Takayasu's arteritis.

Similarly following device implantation where patients display signs of infection, PET-CT imaging is helpful in pinpointing areas of device related infections, e.g. with pacemakers, or in patients with pyrexia of unknown origin due to concentration of FDG at the site of infection.

If you would like to refer a patient for PET-CT or understand more about the benefits PET can offer to your practice contact privatepatients@rbht.nhs.uk.



Inherited Cardiac Conditions Clinic now available at 77 Wimpole Street

RB&HH is one of the largest centres for the diagnoses and management of patients with Inherited Cardiac Conditions in the UK. Our multi-disciplinary team includes the leading specialists in this field. From July, our specialist team will also be offering ICC clinics from 77 Wimpole Street.

Inherited Cardiac Conditions (ICC) are a group of genetic disorders that affect the heart and major vessels, in particular the heart muscle (Cardiomyopathies), the heart rhythm (Inherited Arrhythmia Syndromes) and the aorta (Aortopathy). The Inherited Arrhythmia Syndromes, such as the Long QT syndrome, typically affect the electrical channels of the heart cells, causing electrical disturbances whilst Aortopathy and the associated connective tissue diseases are the conditions that affect the large arteries within the body. Additional inherited conditions include Pulmonary Hypertension and lipid disorders such as Familial Hypercholesterolaemia (Lipidopathy).

The frequency of all ICC combined is approximately 1:100 worldwide.

Tragically, these diseases in many cases lead to sudden death at a young age, which is their major complication, as they are often missed or not managed appropriately, especially when the individual was otherwise healthy and/or asymptomatic and the family history was not mapped and managed.

Although the prediction of sudden death can be challenging, the current knowledge and experience on these diseases allow us to identify the majority of patients at risk and prevent further complications. Other complications, such as stroke, non-fatal arrhythmias and heart failure can also be evaluated and managed. Given that preventing these complications in the current era is possible as soon as the risk is identified, the process of risk stratification needs to be continuous and meticulously performed.

Diagnosis and risk assessment

Diagnosis of these conditions can be difficult for a variety of reasons, including the variability of the disease expression, their complex nature and the subtlety of some of their features. The diagnosis for many of these diseases is based on a combination of markers from different diagnostic areas such as clinical and family history, genetic, electrocardiographic, cardiac imaging, histological and arrhythmic. The most common diagnostic tests include ECG, echocardiogram, exercise test, angiogram, MRI scan and genetic testing, where appropriate. Additionally, these tests are carefully interpreted for the risk assessment of these patients.

RB&HH Specialist Care can provide all diagnostic tests in a one-day assessment in order to ensure the best possible service for patients.

Patient management

The management of patients with ICC depends on their clinical expression and risk profile. It ranges from monitoring, to medical and interventional treatment. Certain details of the patients' history and the results of the investigation can be helpful for the specialist Cardiologist to choose the appropriate patient management pathway. Fortunately, interventions and appropriate management have substantially improved the outcome for patients with ICC. Treatments include lifestyle changes, medication, implantable devices to correct arrhythmias, nonsurgical procedures and surgery.

How can RB&HH help your patients?

Due to their nature, the clinical experience with these diseases is limited to a few centres around the world. Our multi-disciplinary team includes cardiologists, surgeons, genetic specialists, neurologists, imaging experts, psychologists, and specialist nurses. The team work closely together in joint clinical meetings and are supported by a cutting-edge research programme. Together they deliver an integrated day case diagnostic service to children, adults and families and a complete programme for the management of patients with ICC.

The team works closely with each patient and family to provide complete information on their condition and the available treatment options. An important aspect of the service is the screening of family members of all ages for these inherited conditions. Families can be seen together, easing the burden for the family in terms of travel and communication difficulties. This provides for a completely integrated care plan for both individuals and families affected by these conditions.

WHEN TO REFER FOR ICC:

If your patients present the following symptoms or criteria, they may have an ICC.

- Familial history of cardiac conditions **or evidence of ICC on previous diagnostic tests**
- Unexpected death or heart condition, at a young age, of a direct family member
- High Cholesterol
- Connective tissue disorder symptoms
- Unexplained cardiovascular symptoms under the age of 40 years

If you suspect your patient may have an ICC refer them to one of our specialist cardiologists for review.

CONSULTANT CARDIOLOGISTS SPECIALISING IN ICC

CARDIOMYOPATHY

Dr Antonis Pantazis
Dr John Baksi
Dr Alexander Lyon
Dr Piers Daubney (paediatrics)

AORTOPATHY

Professor Christoph Nienaber
Dr Lorna Swan
Dr Nitha Naqvi (paediatrics)

HYPERCHOLESTEROLAEMIA

Dr Mahmoud Barbir

PULMONARY HYPERTENSION

Dr Laura Price

CHANNELOPATHY

Dr Jan Till
Dr Wajid Hussain
Dr James Ware

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CASE STUDY

Nanostim™ leadless pacemaker.

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The new leadless pacemakers

A patient at *Royal Brompton Hospital* was one of the first in the UK to be fitted with an innovative new pacemaker that works without leads.

Bill Hill, 78 from Buckinghamshire, was implanted with a Nanostim™ pacemaker to treat slow heart rate in atrial fibrillation (AF). Bill had the Nanostim fitted in December and was discharged the following day. Consultant cardiologist and electrophysiologist Dr Tom Wong performed the procedure.

The Nanostim is less than 10% of the size of a conventional pacemaker and is implanted directly into the heart via a catheter. Once inserted, the Nanostim securely nestles inside the heart, sending small pulses of electricity when needed to prompt the heart to beat at a normal rate.

> **The Nanostim securely nestles inside the heart, sending small pulses of electricity when needed**

AT A GLANCE

THE PROCEDURE

The self-contained Nanostim is delivered via catheter through the femoral vein to the right ventricle and does not require a pacing lead or a pulse generator pocket. The procedure takes less than one hour and is performed in a cath lab under local anaesthetic.

THE BENEFITS

- Elimination of the visible lump and scar at a conventional pacemaker's implant site
- Removal of patient activity restrictions that may prevent the dislodgement or damage to a conventional lead
- MRI compatible – patients can safely undergo full-body MRI diagnostic scans.

RECOVERY

Patients without complications will normally be discharged the following day of the procedure and can return to normally activity within 1 week.

Dr Tom Wong
Consultant Cardiologist

Dr Tom Wong is consultant cardiologist and electrophysiologist and Chair of Arrhythmias at Royal Brompton & Harefield Hospitals. His areas of expertise are pacemakers, ICDs, cardiac electrophysiology and ablation of all arrhythmias.

Unlike the conventional pacemaker the leadless pacemaker requires no surgical pocket (nor scar or lump) for the pacemaker. The pacemaker battery life is at least equivalent to (if not long lasting than) that of the conventional single chamber pacemakers – with 9 to 13 years of battery life. If the batteries do need to be changed the device can be retrieved and the battery replaced when using the Nanostim system.

Although the incidence of pacemaker complications is relatively low, when complications occur, they typically happen in the pocket where the pacemaker is implanted or with the leads. In up to 1% of patients, the pocket may become infected and in more than 1 in 100 patients, the leads may move out of place causing complication – these are some of the complications the leadless device overcomes. The Nanostim may provide further benefits in avoiding mobility issues in the shoulder that can be experienced in those that are fitted with a conventional pacemaker.

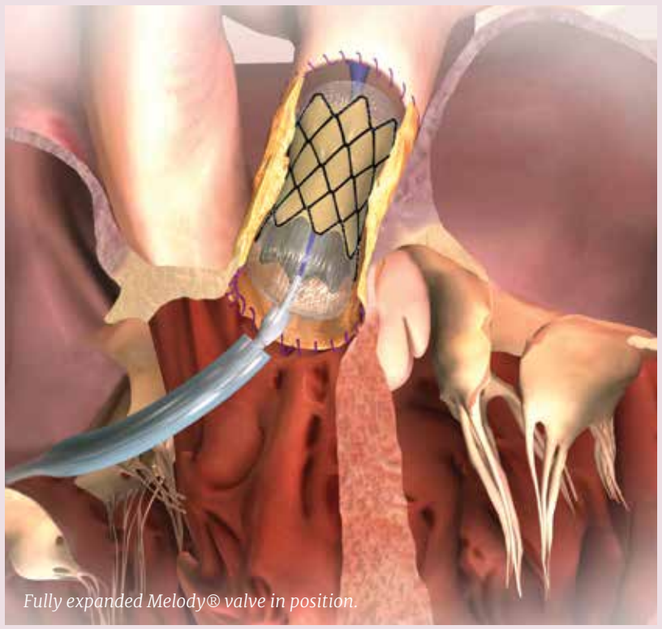
Dr Wong said: "We are excited about the potential advantages that leadless pacemakers could bring to patients. This revolutionary technology offers an alternative to conventional pacemakers for patients who would benefit from a less-invasive procedure.

These devices have the potential to help many people with heart rhythm problems and we are hoping to implant them in more patients who would benefit from this approach in future".

Dr Tom Wong can advise on patient suitability for leadless pacemakers at all RB&HH Specialist Care locations. To referrer a patient email privatepatients@rbht.nhs.uk.

AN INNOVATIVE THERAPY TO RESTORE PULMONARY VALVE FUNCTION

Congenital heart disease (CHD) is the most commonly observed birth defect and a leading cause of infant death in the developed world. Royal Brompton Hospital is pioneering an alternative treatment with a 95% success rate.



Fully expanded Melody® valve in position.

Many adults with CHD are born with a malformation of the pulmonary valve, which sits between the heart and lungs. Most have undergone open heart surgery during childhood to restore blood flow to the lungs with a valve or conduit implantation. These valves or conduits normally last 10–20 years before they need replacing – due to wear, obstruction or loss of efficacy. Previously, because of this, most patients with CHD would often require a second and third open heart surgery to replace the pulmonary valve.

At RBH there is another alternative. For the past five years the congenital heart disease team have been offering Melody Transcatheter Pulmonary Valve (TPV) Therapy – a state-of-the-art innovation in the treatment of CHD. Melody TPV is specifically used to treat the narrowed or leaking pulmonary valve conduit. Dr Michael Rigby and Dr Anslem Uebing lead the clinical programme for this treatment and have implanted almost 100 patients with a 95% success rate.

Adding further international experience, Professor Alain Fraisse joined the RBH team as Director of Paediatric Cardiology in 2014. In an effort to enable more children to benefit from the Melody Valve procedure, Prof Fraisse has been sharing this knowledge internationally as part of The Visiting Doctors Programme.

In 2015 Professor Fraisse visited the Middle East a number of times where he performed the procedure, provided supervision and technical advice to local consultants. He was the first to perform this procedure in a number of Middle Eastern and African countries.

Prof. Fraisse said "CHD is a major concern for patients around the world. Royal Brompton Hospital is one of the largest performers in Europe of the Melody Valve operation and I am pleased to have the opportunity to share and showcase this revolutionary treatment".

Patient Suitability

Prior to the procedure patients are assessed for suitability via MRI and CT scans. This is to ensure the safety of the patient – in approximately 5% of cases the placement of the coronary artery poses too great a risk to carry out the procedure. In addition, some patients will require the implantation of a number of stents prior to Melody TPV therapy, to ensure the blood vessels are supported.

RB&HH are the biggest valve implanters in the UK, and the 5th largest in Europe

Melody® valve with closed leaflets.

Melody® valve images © 2016 Medtronic

The Procedure

A specially designed heart valve is delivered through a catheter and requires only a small incision in the leg. The heart valve is made from a cow's vein that has been attached to a wireframe. For the procedure the valve is placed onto a catheter and guided through the vein to the heart where it will replace the old one.

The majority of patients are fit to leave hospital the day following operation, Dr Rigby adds "This is a highly complex procedure. It is standard practice for Dr Uebing and myself to work simultaneously on each case with a team of valve specialists to ensure the best outcomes. RB&HH are the biggest valve implanters in the UK, and the 5th largest in Europe – it is through this level of experience we are able to offer the best care and outcomes for our patients".

Furthermore, being the largest centre for CHD the team provide care for the entire patient life. This has some key benefits – over the past 20 years the surgeons at RBH have been planning ahead for their patients. When a child has their first valve or conduit implantation, the surgeons ready their valves to ensure they are wide enough and best placed to enable less invasive treatments such as Melody TPV therapy or other future procedures. This negates the need for further open heart surgery which greatly reduces risk and time spent in hospital for recovery and is another element of RBH's multidisciplinary approach.

ASSOCIATED CONSULTANTS

Professor Alain Fraisse
Consultant and Director, Paediatric Cardiology Service

Prof. Alain Fraisse holds expertise in interventional catheterisation in children and adults with congenital heart disease. Prof Fraisse is involved in extensive research work with currently over 120 published research papers in Medline.

Dr Michael Rigby
Consultant Paediatric Cardiologist

Dr Michael Rigby has a specialist interest in interventional cardiac catheterisation in congenital heart disease in children and young adults. His areas of expertise lie in closure of atrial septal defects and ventricular septal defects, cutting balloon dilatation of pulmonary vein stenosis, and pulmonary valve implantation.

Dr Anselm Uebing
Consultant Adult and Paediatric Cardiologist

Dr Uebing leads the adult congenital interventional catheterisation programme which he launched at the Trust in 2010. He undertakes all types of congenital procedures and also supports the paediatric team, having been trained in both adult and children's congenital cardiology.

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An update in Aortic Valve Replacement without Sternotomy

By Toufan Bahrami

One of RB&HH's leading surgical consultants, Mr Toufan Bahrami, discusses the latest developments in aortic valve replacement and presents minimally invasive aortic valve replacement without sternotomy using the Sutureless Edwards Elite® valve.

The techniques of aortic valve replacement are rapidly evolving, with multiple approaches and valve options available. At Harefield Hospital great success has been seen with the newer generation Edwards INTUITY-Elite® valve, which is a balloon-expandable stented trileaflet bovine pericardial bioprosthesis` (Magna ease with known excellent durability of up to 15 years). This new valve offers a number of key benefits and when coupled with the technique of surgical implantation through a mini-thoracotomy or mini sternotomy approach, it provides patients with some key advantages.

'Sutureless' or rapid-deployment (RD) aortic valve replacement (AVR) is an alternative to standard surgical AVR performed through breast bone incision or Transcatheter Aortic Valve Insertion (TAVI). Traditionally high-risk and inoperable patients would be considered for the less invasive TAVI procedure. The progression in minimally invasive surgical techniques is now allowing some of these patients to access the benefits of AVR to treat aortic stenosis.

Edwards INTUITY-Elite® valve

To date we have implanted 63 newer-generation Edwards INTUITY-Elite® valves at Harefield Hospital and more than 80% of these implantations have been performed through right mini-thoracotomy using a 6 cm – 7 cm incision. The results so far show 0% rate of stroke, no leakage around the valve and 0% death rate.

The implantation technique using the INTUITY-Elite® remains independent of the surgical approach chosen by the surgeon; however 90% of my first time heart patients that are deemed suitable for this procedure are opting for mini-thoracotomy as it provides some key advantages.

Key benefits of sutureless AVR via mini- thoracotomy compared to routine surgical AVR include:

- A reduction in controlled cardiac arrest time (up to 30 minutes)
- A reduction in cardiopulmonary bypass time (up to 40 minutes)
- Reduced and discreet scaring by avoiding the opening of the breast bone
- Reduced infection and faster recovery time
- Earlier patient discharge and faster return to routine activities such as driving or work (2 weeks vs. 6 weeks)

In addition to Mr Bahrami's specialism other alternative valve replacement treatments are offered by our team of expert consultants and specialists at Royal Brompton and Harefield Hospitals.

THE PROCEDURE

During this procedure the totality of calcium obstructing the aortic annulus and the left ventricular outflow tract (LVOT) is removed. This step greatly reduces the risk of stroke as the calcified elements of the native valve are completely removed in contrast to TAVI. Complete decalcification also gives the ability to use a larger valve than alternative methods, therefore better durability and Haemodynamic. The valve is then inserted to sit snugly in supra annular position allowing a better haemodynamic and avoiding a mismatch.

As the procedure is performed under direct vision the risk of stroke and paravalvular leak are reduced to near zero. Furthermore the absence of sutures also reduces the requirement for a pacemaker.

This technique is a true curative treatment of aortic valve stenosis with excellent short and long term benefits of up to 15 years.

Mr Toufan Bahrami
Consultant Cardiac and Transplant Surgeon

Mr Bahrami is a consultant in cardiac and transplant surgery at Harefield Hospital. His areas of expertise are endoscopic valve repair and replacement, endoscopic minimally invasive CABG, endoscopic surgical treatment of atrial fibrillation and mitral valve repair. Mr Bahrami is at the forefront of developments in endoscopic minimally invasive heart surgery.

PATIENT CASE STUDY:

Minimal access aortic replacement surgery through thoracotomy using the Edwards INTUITY-Elite® suterless aortic valve.

Mr Davis is an 81 year old gentleman and has always led an active lifestyle, attending the gym at least two or three times a week over the last forty years. In his former years he was also a keen long distance running athlete.

In July 2015 Mr Davis needed sudden medical attention after collapsing at a social event. His GP was concerned his symptoms suggested a potential heart condition which would need further investigation. Consequently, Mr Davis was added to the NHS waiting list to see a specialist cardiologist.

Following his episode in July 2015, Mr Davis began to develop symptoms of breathlessness but put it down to old age and so he continued as normal while waiting for a referral appointment. However, in January 2016 he suffered a serious heart attack; it was at this point Mr Davis decided to contact his private health insurers to arrange a specialist cardiologist review as soon as possible.

Mr Davis was referred to Mr Toufan Bahrami, a consultant cardiologist and transplant surgeon at Harefield Hospital. Mr Bahrami quickly arranged for a series of tests and CT scans to evaluate the extent of Mr Davis's condition. Test results showed Mr Davis had severe calcification in the region of the aortic valve.

Given the patient's age, Mr Bahrami suggested the best treatment options available. Mr Davis felt very re-assured by the advantages of having a mini-thoracotomy as it would be far less invasive than a sternotomy and the scaring would be much more discreet compared to other treatments.

Mr Bahrami arranged for a swift admission so that Mr Davis could undergo the mini-thoracotomy using the Edwards INTUITY Elite® aortic replacement valve.

In March 2016 Mr Davis was admitted to Harefield Specialist Care Hospital, where the dedicated specialist team provided his care throughout the duration of his two week stay. The operation was a success and although initially Mr Davis felt very uncomfortable after the surgery he is now on the road to a full recovery. Within three weeks the scar was healing perfectly and is now just tender, without any signs of infection. Mr Davis was delighted he was able to drive and go shopping so soon after his operation with reduced symptoms of breathlessness. Mr Davis is also looking forward to renewing his gym membership in the near future.

Mr Davis

Royal Brompton & Harefield Hospitals Specialist Care Case Notes *Summer 2016*

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