When delegates from around 150 countries converge on Munich for ESC Congress 2018 they will no doubt reflect on what they themselves eat. Yes, nutrition is up for debate, questioning, for example, whether weight loss therapies can also prevent heart attacks and strokes. Results from the CAMELLIA-TIMI 61 trial of 12,000 overweight individuals with established cardiovascular disease or diabetes could tell us ‘whether becoming slimmer with weight loss therapies also makes you healthier’, explained Professor Stephan Achenbach, Chairperson of the ESC Congress Programme Committee and ESC President Elect. That trial is being presented at the congress.

Results with big impact

Additionally, the huge PURE study, which examined what constitutes a healthy diet in over 200,000 people from more than 50 countries, will be aired. ‘The results will give us new insights on the relationship between the types of food we eat – for example fruit, vegetables, nuts, dairy products and meat – and health and disease,’ Achenbach explained. The Chair also expressed excitement about other trials to be presented, with results ‘to have a big impact, either because they alter population groups or involve innovative treatments.’

For example, two aspiring trials to examine for preventing first heart attacks and strokes prevention will be presented – the ARRIVE trial involved more than 12,000 individuals at moderate risk and the ASCEND trial involved over 15,000 diabetics. ‘We had assumed that taking aspirin can only be good for you, and what’s the harm?’ said Achenbach. But then we discovered that, while aspirin can protect against heart attacks and stroke, it causes bleeding. So it’s not at all clear who will actually benefit from taking aspirin to prevent a first heart attack or stroke. These two trials will shed light on this issue, impacting many millions of people worldwide.’

2018 European Society of Cardiology (ESC) and European Society of Hypertension guidelines on hypertension are another important talking point. ‘The American guidelines (released in 2017) were very strict and lowered the definition of high blood pressure. It will be exciting to see what the Europeans say about what blood pressure qualifies as ‘high’ and how strictly it should be treated,’ Achenbach surmised.

The MARINER trial will reveal whether potentially fatal blood clots can be prevented in acutely ill patients by continuing to administer oral anticoagulation therapy after they return home. ‘Treating patients after discharge is a completely new concept and could affect the millions of people hospitalised every year with heart attack, pneumonia, or broken bones,’ Achenbach prophesised.

Oral anticoagulation is also a focus of the COMMANDER HF trial, which will reveal whether these drugs improve survival and reduce heart attack and stroke in heart failure (HF) patients who do not have atrial fibrillation. Achenbach: ‘This is a massively large patient group that so far not been considered for oral anticoagulation unless they have atrial fibrillation and the trial could change our approach to their management.’

Trials and more

Achenbach also highlighted the MITRA.FIT study, which investigates whether treating the mitral valve with a device inserted via a catheter is advantageous in HF patients. ‘An entire late breaking science session is devoted to transcatheter aortic valve implantation (TAVI) and is aligned to the congress spotlight, Valvular Heart Disease. This includes the LRT Clinical Trial and GARY registry in low-risk patients, the TAXI-PM study on the durability of TAVI, and the five-year follow-up from the FRANCE-2 Registry, which will report on clinical outcomes and valve durability in high-risk patients.’

Major drug trials include ATTRACT, which assessed the efficacy and safety of tafamidis in transthyretin amyloid cardiomyopathy, a condition that currently has few treatment options. The High-BESTAC trial of more than 47,000 patients will reveal whether using high-sensitivity troponin to confirm the diagnosis in those with suspected heart attack leads to more or less deaths and repeat heart attacks after one year. ‘I'm excited by how diverse cardiology is and feel it is my responsibility to represent and balance the needs of the cardiologists, healthcare providers and researchers in every country that belongs to the ESC and across the entire spectrum of cardiovascular disease,’ Achenbach pointed out.

This ethos includes spreading news of scientific findings from ESC journals and registries, guidelines, congresses, and other educational activities.

In our special Cardiology section you will also learn from medical science experts how far machines and scanning skills are shaking the very roots of your discipline.

Enjoy the stimulation of new concepts and technological developments. Enjoy EH along with ESC 2018! Welcome!

Titin: the commonest genetic cause of DCM

Report: Mark Nicholls

A major study has been launched to investigate the interaction between genes and lifestyle factors and dilated cardiomyopathy (DCM). Led by Professor Stuart Cook, at the National Heart and Lung Institute, this, the largest ever DCM study, will investigate whether people develop DCM, with a focus on who is most at risk of sudden death or heart failure (HF).

Six hospital trusts across England – including the Royal Brompton and Harefield NHS Trusts and Imperial College London – will recruit patients for the study.

DCM thins cardiac muscle, making it less able to pump blood around the body. About one in 250 (260,000) people in the UK are affected, with around one in 100 (650,000) believed to be at risk of developing the condition due to a common mutation in the titin protein.

This mutation predisposes the heart to developing DCM when it is placed under stress such as during pregnancy, some cancer treatments and possibly alcohol abuse.

Due to thinned cardiac muscle, a heart affected by dilated cardiomyopathy (left) can pump less blood around the body than a normal heart (right).

For example, two aspiring trials to examine for preventing first heart attacks and strokes prevention will be presented – the ARRIVE trial involved more than 12,000 individuals at moderate risk and the ASCEND trial involved over 15,000 diabetics. ‘We had assumed that taking aspirin can only be good for you, and what’s the harm?’ said Achenbach. But then we discovered that, while aspirin can protect against heart attacks and stroke, it causes bleeding. So it’s not at all clear who will actually benefit from taking aspirin to prevent a first heart attack or stroke. These two trials will shed light on this issue, impacting many millions of people worldwide.’

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Study examines genes and lifestyle links to dilated cardiomyopathy

Study to improve diagnostics and therapy

DCM is a complex condition and can be caused by a variety of genetic and environmental factors but cardiologists also recognise it is poorly understood, with most causes unknown.

A leading course of heart transplantation, and after coronary heart disease, DCM is the leading cause of heart failure. The condition has poor outcomes with research suggesting that 15% of patients do not survive beyond five years after diagnosis, and up to half of deaths occur within the first two years of diagnosis.

In the new multi-centre study of more than 2,000 patients researchers will use advanced DNA sequencing, biological markers in the blood and cardiac imaging approaches to assess interactions between genes as they seek to discover new genetic mutations underlying DCM, as well as to assess potential environmental interactions.

Ultimately the study aims to find better ways to diagnose, treat and prevent deaths from DCM.
Intracardiac echocardiography (ICE) is an increasingly important guiding tool for structural heart disease interventions without general anaesthesia. José Ribeiro, who works in the thorax and circulation unit at Gaia Hospital Centre, Portugal, has worked with this technology for two years and explains the benefits and limitations in an exclusive interview with Daniela Zimmermann of European Hospital.

Discussing developments in intracardiac echocardiography at the thorax and circulation unit in Gaia Hospital Centre, Portugal, he explained that advances in transoesophageal echocardiography (TEE) became clear. Consequently, he added, ‘a significant number of interventional cardiologists have started to use ICE.

‘We still have limitations with ICE for structural heart disease, because we don’t see all the structure in the same plan and need to navigate with a catheter inside the heart. That’s why it’s so important for 3-D imaging to guide procedures.

‘We don’t need too much imaging to guide the intervention for structural heart disease. But we need to have a good pre-procedure evaluation and plan the procedure, and after that we only need specific steps to ensure procedure quality and check the results. If we can get the cardiac structures on 3-D, we have a significant advantage for guidance.

‘We are using an angle 2-D catheter, which only enabled us to view small volumes of the heart. With ICE and TEE, we can view the structures, for instance a valve, left appendage or oval fossa. So we developed a new device with a wide opening angle; it’s a 12.5-Fr catheter and this enables us to view significant volumes of the cardiac tissue, including the whole mitral valve. This development appears to be a great advantage for guidance.

‘Yes, we need to look inside and decompose it in a different 2-D plan to navigate more easily, which enables us to be more confident when doing the procedure.

‘With a 3-D wide angle ICE catheter, we have the same benefits as with 2-D ICE, meaning we don’t need an anaesthetist, the interventional cardiologist can do the intervention himself or herself, by putting the catheter in the right place to see the heart.

‘But we can also obtain a significantly higher amount of information and anatomy, so that the intervention

Images of intracardiac echocardiography obtained with Acuson V wide angle catheter (Siemens Healthinners); on 3D images we can see entire cardiac structures: on top right the fossa ovalis, on top left the left atrial appendage opening (LAO), on bottom right the mitral valve with anterior (AL) and posterior (PL) leaflets and on bottom left the device including LAO.

Discussing Advances in nuclear ischaemic testing, from SPECT to PET and beyond, Dr Kshama Wechalekar, who heads Nuclear medicine and PET at the Royal Brompton Hospital in London, and is President of the British Nuclear Cardiology Society (BNCS), told delegates that advances in nuclear imaging and the development of new devices and techniques has improved ability to detect and diagnose ischaemia. There is improved spatial resolution from multiple solid state CZT (Cadmium Zinc Telluride) detectors and therefore sensitivity is very high,’ she explained. ‘You can reduce the acquisition time at least by half with excellent quality and the equipment has a small footprint. The advantages of solid state detector cameras is that you can reduce the radiation dose by one third, have high sensitivity and resolution, an open design suitable for claustrophobic patients, and good image quality even in obese patients.

SPECT PET and CMR

Recent studies have shown ability to do dynamic imaging offering potential in quantitative myocardial perfusion with SPECT. Wechalekar pointed out, adding that SPECT is less expensive than current PET and MRI.

‘The future of SPECT Nuclear cardiac imaging, she concluded, ‘is in solid-state technology. Dynamic imaging, although technically challenging, can add value to MPI in the detection of ischaemia. Whilst PET is the most accurate imaging technique for ischaemia assessment and prognosis, it remains expensive and less accessible.’ She also felt that the new tracer, Flurpiridaz, with results of phase III trials in the UK pending, might change the Future of PET MPI.

‘One area of concern was how to persuade more people to train in nuclear cardiology with falling numbers in the field. The BNCS Council is working hard to improve curriculum, organise level 1 and 2 training courses, and to identify centres that can offer nuclear cardiology training across the country that is easily accessible for trainees,’ she said.

‘Dr Chiara Bucciarelli-Ducci, Consultant Senior Lecturer in Cardiology/non Invasive Imaging at the Bristol Heart Institute, University of Bristol, explored the issue of quantitative versus visual assessment in PET perfusion stress. She explained that stress CMR has been included in the ESC guidelines since 2014 (ESC revascularisation guidelines) based on evidence using visual assessment of ischaemia, rather than quantitative.

Bucciarelli-Ducci discussed pros and cons of both visual and quantitative assessment, limitations and opportunities to increase spatial resolution, and very recent studies showing that there is no difference in diagnostic accuracy visual vs. quantitative. Quantitative perfusion is promising, but the acquisitions and analysis need simplification to meet the need of a busy clinical service.

‘CMR perfusion (visual) is a good clinical tool already, she concluded, ‘but can get better while quantitative CMR perfusion is evolving into faster and robust tools. While several methods are available, more in vivo and clinical validation is needed with a number of studies in the pipeline.’

Function addition can improve specificity

Dr Marc Dweck, BHF Reader in Cardiology and Consultant Cardiologist at the University of Edinburgh and the Edinburgh Heart Centre, posed the question, ‘CT-FFR or CT perfusion, which is better?’

‘CT-FFR/CT perfusion – neither or both?’

‘CT Perfusion,’ he acknowledged, ‘is interesting, but I’m not sure how we are going to use it in clinical practice. With CT-FFR you get beautiful pictures, where you can look down the coronary arteries and see areas that are not getting enough blood. The advantage of this technique is that you can use it on a post-hoc basis, on scans where you are not sure if a lesion is obstructive or not, without any extra radiation or medication for the patient. This may be useful in lowering the rates of patients being sent for claustrophobic patients, and good image quality even in obese patients.

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Ischaemia: Advances in nuclear imaging

Intracardiac echocardiography (ICE) has benefits

More people need nuclear cardiology training

Refined guidance with no need for anaesthetic

ICE could be useful in some scenarios. The main limitation of ICE is lack of experience with the technology. In addition, if the case is too complex, we may need to cross with the catheter to the left side, so we need to move the catheter to be sure.

ICE is a step forward, especially with this new dimension – 3-D ICE. But, we also use ICE in normal mitral valve repair and left aortic valve repair.

Jose Manuel Coelho Ribeiro MD directs the Thorax and Circulation Unit at Vila Nova de Gaia Hospital Centre in Portugal. Nosing graduated from Oporto medical school in 1992 he became a cardiology specialist in 1996, which was followed by an echocardiography fellowship at Onze-Lieve-Vrouwekliniek in Aalst, Belgium. He also became a member of the Portuguese Cardiology College. Since 2001, he has led the echo lab (with 9,600 studies in 2017) and, from 2006, has been cardiology consultant in the Espinho Hospital Centre at Vila Nova de Gaia, where he has implemented new techniques including transoesophageal echocardiography, as well as coordinated several telemedicine projects.

For which cases do you use TEE and ICE?

In our lab we check all patients in the echo lab in a selection process and, when we are very confident about the pathology or anatomy, we use the stress imaging technique (TEE or ICE) for guidance and to improve confidence during the procedure.

In simple cases, such as ASD or PFO closure, we use ICE. As mentioned earlier, ICE gives us many advantages - no anaesthesia needed, more comfort, etc. For more complex cases we must decide how much imaging we need.

We also use ICE in normal mitral valve repair and left aortic valve repair. We have initial experience with this wide angle 3-D ICE catheter that crosses the inter-atrial septum to scan left side structures, for instance.

So far, our experience with ICE is limited. But even with more experience, in complex cases we tend to prefer the technique or imaging tool with which we have more experience, so TEE may still be preferred in such scenarios. The main limitation of ICE is lack of experience with the technology. In addition, if the case is too complex, we may need to cross with the catheter to the left side, so we need to move the catheter to be sure.

ICE could be useful in some patients who cannot be imaged with TEE. Both methods are alternative. ICE is a step forward, especially with this new dimension – 3-D ICE. But, we also use ICE in normal mitral valve repair and left aortic valve repair.

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To the cath lab following CT. Patients most likely to use CT-FFR, he added, are those with borderline lesions, though he stressed the key lies in a patient’s history and only using CT-FFR in patients with recalcitrant angina symptoms.

CT is a powerful imaging technique that informs about coronary artery anatomy (plaque burden, stenosis severity, plaque characteristics), he concluded, but emphasised that the addition of functional technique to the scan protocol can improve its specificity to identify obstructive stenosis, providing a comprehensive assessment of anatomy and function.

With CT perfusion, radiation dose is increased, while CT-FFR has increased cost, though CT-FFR potentially fitted in better with patient workflows.

Professor Darrel Francis is Professor of Cardiology, Imperial College London. His work in ischaemia has included the ORBITA trial of revascularisation and the BRAVO trial of automated haemodynamic optimisation of cardiac resynchronisation therapy pacemakers.

His audience poll revealed cardiologists unanimously considered ischaemia to be a continuous gradation rather than dichotomous.

But unfortunately, genetic testing is often not helpful for people with DCM, as we only know about a small number of genes which cause the condition. In 2011, Professor Cook and his team established the genetics and genomics group at NHLI and helped develop and apply unbiased, integrated systems genetics and genomics approaches combined with high-resolution cardiovascular phenotyping to identify new genes and mechanisms for cardiac hypertrophy and dysfunction.

The team has used genome-wide association in humans to identify new loci and genes for DCM and has already identified titin as the commonest genetic cause of DCM.
The changing face of imaging in cardiology

While the question is still debated as to whether MRI is the better CT, along comes a potential game changer – a new data based 3-D reconstruction method of heart anatomy and function that aims to replace diagnostic coronary angiography. In the near future not only adult patients with coronary heart disease could benefit from this new technique but also children with complex congenital heart defects. Meanwhile imaging is conquering the cardiac operating room (OR).

The physician, using smart glasses, in the virtual space has just removed the aorta at its root from the heart to examine it separately. Observers can follow on conventional screens. Courtesy: S. Engelhardt

Coronary angiography will lose diagnostic value

Coronary angiography will lose diagnostic value

Non-invasive first
To date, only the California-based HeartFlow Inc. can calculate FFRCT. Based on data obtained in a conventional CT, the company’s software, using flow mechanics, can reconstruct heart, aorta and coronary vessels in terms of geometries as well as pathophysiology and function in 3-D. Moreover it visualises the flow and can thus show whether a haemodynamically relevant blockage is present, i.e. whether the patient needs a stent or a bypass.

In 2015, Professor Pamela S. Douglas, cardiologist and Head of Multimodal Imaging at the Duke Clinical Research Institute in Durham, North Carolina, USA, showed the potential benefit of this method using 584 patient cases from 11 hospitals. Ten patients with suspected CHD underwent diagnostic cardiac catheterisation, but the suspicion was confirmed only in three patients – seven underwent unnecessary catheterisation. Six out of ten patients with suspected CHD, whose FFRCT was determined first, did not need angiography. In three out of the four patients who did receive angio, the suspicion was confirmed – i.e. only one patient underwent an unnecessary angiography. This feasible and safe method shows a significantly lower rate of unnecessary invasive angiographies, Douglas confirmed. Investors seem to buy in: HeartFlow, which already today is cooperating with the Big Three – GE, Siemens, Philips – recently raised USD 240 million to further develop the technology, launch new studies and drive commercialisation of its product.

To establish 3-D imaging in congenital heart disease treatment, paediatric cardiologists Animesh Banerjee and Tariq Tusun and Tariq Hussein founded VARYFII Imaging, LLC, in Dallas, USA. They construct complex anatomical models of the individual patient’s pathologies using MRI or CT data. Cardiologists as well as surgeons can enter the virtual and augmented realities of the anatomical models with the help of data headsets to lift certain structures, analyse and reposition them and thus devise the best strategy.

The flow must continue
Imaging has arrived in cardiac surgery – during the intervention itself and combined with flow measurements. Professor Gabriele Di Giammarco, cardiac surgeon at Gabriele D’Annunzio University Hospital in Chieti, Italy, praised the combination of high-frequency epicardial ultrasound (ECUS) and fractional flow reserve (FFR) in a single device ‘decision making’ and explains: ‘Hard calibrations are the thing to feel. I do not feel the dangerous soft plaques. With MiRAQ, I see them in the operative ultrasound, I adapt my strategy and perform surgery in no-touch technique and off-pump.’

‘Our heart beats in 3-D, so why not examine it in 3-D?’ asks Dr. Sandy Engelsdorff, researcher at the Computer-Assisted Surgery Group at the Department of Simulation and Graphics at Otto von Guericke University, Germany. In addition to treatment planning and education she envisages a further application of this new technology: informing the parents of the young patients.

From Vision to Impact. That’s Excellence for Life.
The future POCT heart attack test

**On the way: mobile cMyC analysis**

Experts report that a new blood test to diagnose heart attacks could be carried out on a hand-held device in the not-too-distant future.

**The test,** devised by a team at Kings College London, uses similar technology to the troponin test, but instead analyses cardiac myosin-binding protein C (cMyC).

In research presented at the British Cardiovascular Society conference in Manchester, UK, this June, Dr Tom Kaier, BHF Research Fellow, explained that levels of cMyC in the blood increase more rapidly after a heart attack and to a higher extent than troponin. With this offering the opportunity to rule out a heart attack in a higher proportion of patients instantly, the research team believes it has a role in providing a swift diagnosis in Accident & Emergency (A&E) departments.

Scientists are optimistic that this relatively straightforward test could be used as a hand-held point of care test (POCT), and avoid samples being sent to the laboratory.

**cMyC outperformed troponin**

Kaier, who was among the lead researchers, emphasised the importance for doctors and patients to know, as early as possible, who has had a heart attack and who has not.

'Now that we know this test is sensitive enough to give an almost immediate heart attack diagnosis,' he said, 'we need to work on developing a testing device.'

As work on developing a POCT device continues, the team hope that it could be used in wards, or ambulances - within five years, replacing time-consuming despatch of samples to hospital labs.

Trials of the test have been conducted around Europe by international collaborators. In Denmark, blood was taken from 776 patients travelling to hospital by ambulance, which the King’s College London researchers then tested for cMyC protein.

In patients who had suffered heart attacks, Kaier said, the protein was present in high enough concentrations 95% of the time for an on-the-spot diagnosis.

The cMyC test outperformed the existing troponin test, which diagnosed only around 40% of patients in this way, mainly because troponin takes longer to reach detectable levels in the blood after a heart attack.

'A stand-out feature is cMyC's ability to more effectively triage patients,' Kaier said. 'This distinction is likely related to the documented greater abundance and more rapid release profile of cMyC. If used on a POCT platform, cMyC could significantly improve the early triage of patients with suspected AML.'

**Better rule-in and rule-out rate**

Figures show that more than 65% of people who attend A&E with chest pain have not had a heart attack, though all will receive an ECG and a blood test to measure troponin levels. With the cMyC blood test shown by the KCL team to have a better rule-in and rule-out rate for heart attack, the research team believes this will be a valid tool in reassessing patients sooner and avoiding unnecessary hospital stays for further tests.

In part, the research has been funded by the British Heart Foundation, which said the initial results from the cMyC test look ‘very promising’ for patients and acknowledges that it could lead to quicker diagnosis and treatment, or see patients reassured and discharged.

However, BHF Associate Medical Director Professor Jeremy Pearson stressed that further research was necessary before cMyC could be recommended as a replacement for the troponin test.

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Scientists are optimistic that this relatively straightforward test could be used as a hand-held point of care test (POCT), and avoid samples being sent to the laboratory.

**cMyC outperformed troponin**

Kaier, who was among the lead researchers, emphasised the importance for doctors and patients to know, as early as possible, who has had a heart attack and who has not.

'Now that we know this test is sensitive enough to give an almost immediate heart attack diagnosis,' he said, 'we need to work on developing a testing device.'

As work on developing a POCT device continues, the team hope that it could be used in wards, or ambulances - within five years, replacing time-consuming despatch of samples to hospital labs.

Trials of the test have been conducted around Europe by international collaborators. In Denmark, blood was taken from 776 patients travelling to hospital by ambulance, which the King’s College London researchers then tested for cMyC protein.

In patients who had suffered heart attacks, Kaier said, the protein was present in high enough concentrations 95% of the time for an on-the-spot diagnosis.

The cMyC test outperformed the existing troponin test, which diagnosed only around 40% of patients in this way, mainly because troponin takes longer to reach detectable levels in the blood after a heart attack.

'A stand-out feature is cMyC's ability to more effectively triage patients,' Kaier said. 'This distinction is likely related to the documented greater abundance and more rapid release profile of cMyC. If used on a POCT platform, cMyC could significantly improve the early triage of patients with suspected AML.'

**Better rule-in and rule-out rate**

Figures show that more than 65% of people who attend A&E with chest pain have not had a heart attack, though all will receive an ECG and a blood test to measure troponin levels. With the cMyC blood test shown by the KCL team to have a better rule-in and rule-out rate for heart attack, the research team believes this will be a valid tool in reassessing patients sooner and avoiding unnecessary hospital stays for further tests.

In part, the research has been funded by the British Heart Foundation, which said the initial results from the cMyC test look ‘very promising’ for patients and acknowledges that it could lead to quicker diagnosis and treatment, or see patients reassured and discharged.

However, BHF Associate Medical Director Professor Jeremy Pearson stressed that further research was necessary before cMyC could be recommended as a replacement for the troponin test.
Eminent Spanish cardiologist highlights the evolving role of imaging in ventricle arrhythmias treatment

Professor Josep Brugada studied medicine at the University of Barcelona, Spain, before moving to the University of Montpellier, France, to specialise further in the clinical and basic aspects of cardiac arrhythmias. He then went on to become Assistant Professor at the University of Limburg and was the first foreign established investigator of the Dutch Royal Academy of Arts and Sciences. In 1991 he returned to the hospital at the University of Barcelona, where he became professor of medicine, head of the arrhythmia unit; and, of cardiology, director of the thorax institute and finally medical director. He is now professor of medicine, director of the paediatric arrhythmia unit at Sant Joan de Deu Hospital in Barcelona.

MRI has a central role in picking up myocardial disease, a condition that particularly affects women but is often left untreated, according to Allison Hays, a cardiologist and assistant professor at the Johns Hopkins University School of Medicine, speaking at CMR 2018 meeting in Barcelona.

‘Heart attack in women presents differently than in men and requires a different approach when it comes to diagnosis and treatment,’ said Allison Hays.

When they eventually come in for diagnosis, women have much less rates of having abnormal cardiac catheterisation test, which shows degree of stenosis in coronary arteries.

For more information, please go to the website: https://www.european-hospital.com
Heart highlights cardiac in women

The same is true for CT, because you’re just taking pictures to know how much narrowing or blockage there is, but it does not capture how much small vessel disease you have. Both modalities miss a lot of disease in women,’ she pointed out.

The novel field of non-contrast MRI, which uses T1 and T2 mapping, may be an additional tool to detect areas of microvascular perfusion in women. The technique has a lot of prospects but it is still a very new area of research and requires more investigation, Hays underlined. In the USA the Women’s HARP study, a multi-centre, diagnostic observational study that aims to compare perfusion MRI results of women with heart attack to cardiac catheterisation techniques using optical coherent tomography will bring more knowledge of MRI’s value within the next two years. It will also provide information on plaque inflammation and see whether this correlates with microvascular abnormalities. ‘That will be interesting, to determine the reasons why there is microvascular dysfunction,’ Hays said. MRI is usually less available than other modalities, but it is worth the extra effort to find centres of excellence because of the unique insights it offers, and not just in microvasculature, she believes. ‘CT and nuclear tests are not so sensitive to image microvasculature. MRI plays a critical role not only for microvasculature disease, but also for heart failure, since a lot of women have heart failure with preserved fraction.’
It’s time to look again at IN-TIME.

As the world’s largest cardiology congress gets underway in Munich, it’s worth looking back to previous ESC sessions to see how scientific debates have evolved. At ESC 2016, held in Rome, REM-HF investigators presented data suggesting remote monitoring in implantable cardiac devices offered no added clinical benefit. Two years on, there are reasons to re-examine that conclusion, with a recent analysis of the IN-TIME trial suggesting the key to remote monitoring benefits might be found in workflow processes.

Published in The Lancet in 2014, the IN-TIME study is the only trial to date, to have demonstrated a clear benefit of implant-based remote monitoring in heart failure patients, showing a more than 50% reduction in all-cause mortality – significantly better than in a 2015 meta-analysis, and three other recent trials, found no significant clinical benefit.

However, IN-TIME was also the only implant-based remote monitoring trial using a transmission technology that sent daily updates to a central monitoring unit. Similar to the REM-HF technology that transmitted implant data on a weekly basis, which did not show any statistical benefit for IN-TIME, REM-HF used technology that transmitted implant data on a weekly basis. What is fundamentally different in its methodology that might account for its results?

Multiparametric data

This is a central question in the recently published Remote Monitoring and Clinical Outcomes: Details on Information Flow and Workflow in the IN-TIME Study by Husser et al. The authors note that IN-TIME used multiparametric data that was transmitted daily. Crucially, a workflow process was set up such that study investigators could typically contact patients less than a day after receiving an event alert and arrange any necessary follow-ups for less than a week later.

The study authors point out that, in the recent TRUECOIN meta-analysis, the IN-TIME approach was shown to be beneficial for patients with heart failure, since it provides early enough warning to potentially prevent deterioration in the patient’s condition due to new onset atrial fibrillation, asymptomatic ventricular tachycardia, or other adverse events. It is this early appraisal – facilitated by efficient workflow processes, including multiparametric daily transmissions — that make the difference in the IN-TIME study, authors argue.

As the European cardiology community gathers for ESC 2018, it’s an excellent time to re-examine existing evidence for clues we may have missed, alongside the latest breaking research. That’s why it’s time to look again at IN-TIME.