

# Congress News

Sunday 26 August 2018

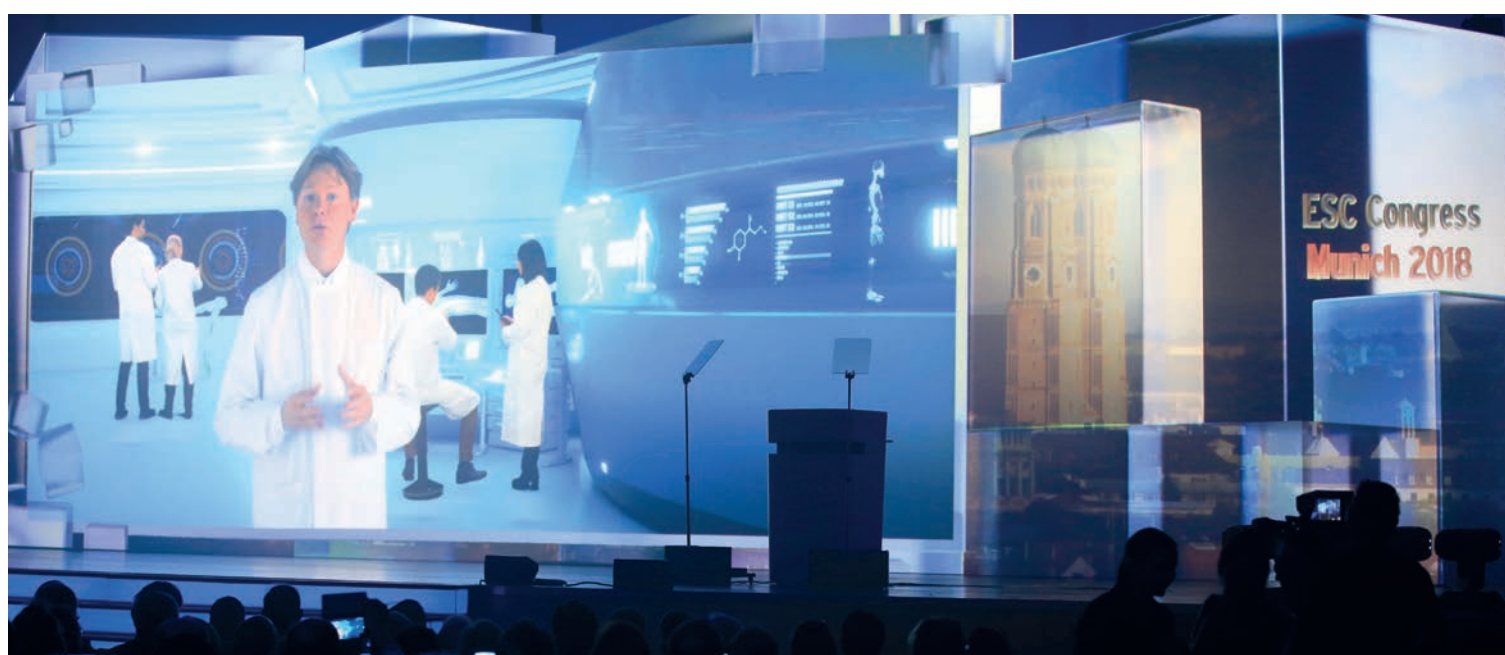
## Top picks

**PAGE 10** Forehead wrinkles and cardiovascular death  
Is there a link?

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How to stay connected and informed

**PAGE 11** CULPRIT-SHOCK  
One-year results support guidelines change

**PAGE 12** Stroke prevention in atrial fibrillation  
2018 EHRA Practical Guide on NOACs



## An inspirational and futuristic start: ESC Congress 2018 Inaugural Session

The cutting-edge Inaugural Session began with ESC President, Jeroen Bax, in a video depicting a CV lab of the future. He said, "Often in life, our biggest limitation is our lack of imagination. But that's not something we can afford, not in cardiovascular research. No one knows where the science will lead. What we do know is that we must keep pushing ourselves to dream bigger-bigger and bolder." When talking about being a cardiologist today, Prof. Bax described some of the impressive breakthroughs over the last 20 years but urged that with so much focus on new technology, we must not lose sight of the person we are treating and how we must always empathise with patients.

**"Patients turn to us, not only to fix their hearts, but to calm their fears. They need us to connect with them," said Prof. Bax**

In the Special Guest Interview, we heard from world-famous musician and actress, Barbra Streisand and her crusade to promote heart health, particularly championing improvements for women. "Many people think heart disease only strikes old men. Women are not making

a personal connection with heart disease and sharing their stories," she stated. As a message to ESC delegates, she went on to say, "I want to thank you for the research you are doing that is expanding the boundaries of cardiovascular medicine, allowing millions more people-men and women-to lead healthier lives."

From one international superstar, to another, Professor Eugene Braunwald gave the Inaugural Address on the key partnership between academic medicine and industry, using cholesterol research and statins as an example. When talking about the future and advances such as precision health, digital health and big data, Prof. Braunwald concluded, "One thing is clear, collaborations between academia and industry will become even more important when applying these

emerging technologies." In recognition of his enormous contribution, Prof. Braunwald was presented with a commemorative plaque.

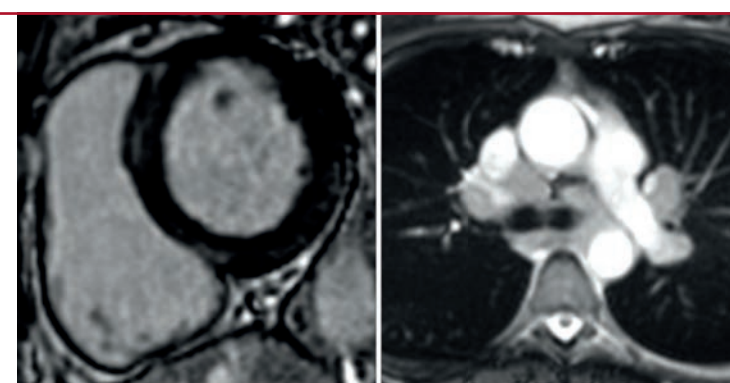
We heard the stories of three exceptional cardiologists: Ottavio Alfieri (San Raffaele University, Milan, Italy), Evgeny Shlyakhto (Almazov Centre, Saint Petersburg, Russia) and Marc Pfeffer (Brigham and Women's Hospital, Harvard Medical School, Boston, Massachusetts, USA) and, in recognition of their contribution, they were presented with the ESC's highest honour, the ESC Gold Medal. More than 250 newly elected Fellows of the ESC (FESC) were welcomed and applauded. In a special tribute to the first FESC, the prominent Dutch cardiologist, Paul Hugenholtz, Prof. Bax proudly announced that the new Paul Hugenholtz Lecture on Innovation in Cardiology will now take place at every ESC Congress.

### What's Your Diagnosis?

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Cardiovascular Magnetic Resonance (CMR) late gadolinium enhancement image (left) and white blood transaxial image (right) in a 41-year-old female with shortness of breath and preserved LV function.

Kenneth Fung, Barts Heart Centre, London, UK  
Steffen Petersen, Barts Heart Centre, London, UK



Answer on page 3.

**NEW**

## ESC DIGITAL HEALTH AREA

All scientific sessions and industry innovations in one place...



### In Exhibition 3

8/10 cardiologists believe digital health will radically change their practice

**Are YOU ready?**



ESC William Harvey Lecture on Basic Science

# Genetic engineering to mend the heart



**Prof.  
Silvia G. Priori**

**Today, Professor Silvia G. Priori (University of Pavia, Italy) will give the William Harvey Lecture on Basic Science (Sunday, 12:00 – 12:30; Brussels – Village 4).**

Prof. Priori has been involved in the study of the genetic basis of inherited arrhythmogenic diseases and has contributed to the significant progress that has been made in this field. “In the past 20 years, we have seen the discovery of the first genes responsible for inherited arrhythmias, the establishment of genotype-phenotype correlations and now we are heading toward the development of genotype-based management strategies. However, current treatment with medication and implantable

cardioverter-defibrillators is still not sufficient to reduce mortality and morbidity and patients still live with the anxiety that death could be around the corner.”

**“The next frontier is developing gene therapies to fix the consequences of the molecular defects and to bring these therapies to the clinic.”**

Gene therapy may represent an innovative therapeutic strategy to combat arrhythmogenesis. Prof. Priori and her team have contributed to the identification of novel genes associated with inherited arrhythmias, such as the discovery of mutations in the dominant gene that causes catecholaminergic polymorphic

ventricular tachycardia (CPVT).<sup>1</sup> Prof. Priori and her team have subsequently developed gene therapy strategies for both the dominant and the recessive forms of CPVT, adopting targeted strategies for each form of the disease.<sup>1</sup>

To provide a preliminary validation in humans of the gene therapy strategies, Prof. Priori’s group at the University of Pavia has validated the efficacy of their molecular strategies in human cardiac myocytes differentiated from induced pluripotent stem cells (iPSCs) of CPVT patients.<sup>2</sup> These preclinical data were received with interest by the scientific community as they overcame the existing concern that gene therapy would not be effective in treating inherited arrhythmias and in fact could even be pro-arrhythmic by creating inhomogeneous protein expression among cardiac cells. Now that the spell of ineffectiveness of gene therapy to treat cardiac arrhythmias has been dismissed, at least in CPVT, the next challenge is to move

toward a ‘first-in-man’ study and determine whether the novel therapies may provide a relevant clinical benefit.

Whether gene therapy strategies will be developed soon for other inherited arrhythmias is an intriguing question raised not only by scientists but also by affected patients and their families. Prof. Priori explains, “A key limitation to the development of molecular strategies for other genetically determined arrhythmias is represented by the lack of reliable preclinical animal models. More work is therefore needed to create models where the manifestations of diseases are similar to those of humans. These missing ‘advanced’ models may provide the leverage needed to establish a platform for further development of molecular therapies to treat life-threatening inherited arrhythmias.”

1. Bongianino R, et al. Circ Res. 2017;121:525–536.  
2. Lodola F, et al. Cell Death Dis. 2016;7:e2393.

# Large Canadian study provides important clinical insights into spontaneous coronary artery dissection



**Dr.  
Jacqueline Saw**

**Yesterday, in a late-breaking abstract presentation, Doctor Jacqueline Saw (Vancouver General Hospital, Vancouver, British Columbia, Canada) reported initial findings from a large prospective, multicentre, Canadian cohort study of spontaneous coronary artery dissection (SCAD) conducted to explore the clinical presentation, natural history and long-term cardiovascular outcomes relating to the condition (Abstract 76).**

**“SCAD has been poorly understood for many years and there is still much to learn, which is why this study is so important.”**

She explains that, “It is only recently, with remarkable advances in intracoronary imaging, that we are seeing SCAD as an underlying cause of myocardial infarction (MI), particularly in women. New imaging techniques have improved our recognition of the angiographic appearance of SCAD, but our knowledge of many clinical aspects of the condition is still very limited, and this is why we performed the study.”

A total of 750 patients (88.5% women; mean age 51.8 years) with acute presentation of non-atherosclerotic SCAD were prospectively recruited from Canada (20 centres) and the USA (two centres)

over a four-year period up to June 2018. A third of patients had no cardiac risk factors. A prior history of SCAD was reported in 5.6% of patients and 2.4% had a family history. “Emotional stress was more commonly reported than physical stress as a precipitating factor, accounting for 50.3% and 28.9% of cases, respectively,” reports Dr. Saw. Fibromuscular dysplasia was the most frequent potential predisposing condition (31.1%), with others including peripartum status, fertility treatment, systemic inflammatory disease and connective tissue disorders. All patients presented with acute coronary syndrome, primarily non-ST-elevation MI (69.9%), followed by ST-elevation MI (29.7%) and unstable angina (0.4%). The predominant presenting symptom was chest pain (91.5%). Consistent with the literature, SCAD type 2 occurred more frequently (60.2%) than type 1 (29.0%) or type 3 (10.8%).

Considering the medical management of SCAD, Dr. Saw remarks, “As might have been expected, based on reports in the literature advocating a conservative approach, most patients (84.3%) in our study received conservative treatment. Others underwent percutaneous coronary intervention (14.1%) and a minority had coronary artery bypass surgery (0.7%).” The in-hospital major adverse event rate was 8.8%, including cardiac arrest (3.9%), cardiogenic shock (2.0%), recurrent MI (4.0%) and unplanned revascularisation (2.5%). Importantly, “the 34 patients (4.5%) with peripartum SCAD had higher in-hospital major adverse events,” notes Dr. Saw. The incidence of major adverse cardiovascular events (MACE) at one month was 8.8%, consisting primarily of recurrent MI (6.1%), stroke/transient ischaemic attack



(1.2%) and unplanned revascularisation (2.7%). Peripartum SCAD and connective tissue disorder were independent predictors of 30-day MACE. Dr. Saw comments that, “Acute in-hospital and one-month survival was good, with only one death (0.1%) reported.” The study will continue to monitor MACE in the longer term and plans to report findings at six and 12 months, and annually for a further three years.

**Notably, although the majority of patients received conservative treatment, in-hospital and one-month survival was good.**

“Despite the good survival data, a small proportion of patients (4.9%) experienced recurrent cardiac symptoms requiring repeat emergency room visits within 30 days post-discharge, and 2.5% required admission for chest pain,” notes Dr. Saw.

“These initial data provide some good insights into the clinical presentation, precipitating stressors, predisposing conditions and MACE relating to this important medical condition, but further studies are needed to more fully explore the management of patients with SCAD,” she concludes.



ESC Andreas Grüntzig Lecture on Interventional Cardiology

# Understanding when less is more



**Prof.  
Martin Leon**

**Ahead of his Andreas Grüntzig Lecture this morning, Professor Martin Leon (Columbia University Medical Center, New York, New York, USA) explains the thinking behind his intriguingly entitled talk, ‘The interventional paradox: When more is more and when less is more’.**

For decades, interventional cardiologists have been devising ways to use catheter-based techniques to improve patient outcomes while avoiding surgery. “It has been an evolution and now a revolution,” explains Prof. Leon, “starting with what we now regard as the simple balloon angioplasty technique devised by Andreas Grüntzig and subsequently utilising advanced new device technologies to provide doctors with access to a wide range of exciting, even radical, tools. These new technologies are seductive but we should resist the temptation to always make them

a first port of call. Instead, we should use our clinical judgement to decide whether a complex approach will improve outcomes to any meaningful degree beyond that achievable with a more simple technique.” There are times, he says, when more is more, “such as we have seen with the transcatheter valve technologies that have transformed the lives of hundreds of thousands of patients.” But simplicity may be the best approach in other situations. “Stents are a cornerstone of management in practices around the world but they may not represent the best care for all patients,” explains Prof. Leon. “New, easy-to-use—and widely available—tools to gauge their suitability are underutilised, possibly because it is easier to follow standard practice than to explore potential alternatives. For the sake of our patients we need to combine our experience with the available scientific evidence to enable us to understand how and when to use available technologies more intelligently,” he urges.

**“Complexity is not always the best policy; simplicity can often be as effective”**

Prof. Leon is confident that interventionalists are switching on to this way of thinking. “We are definitely seeing a change, although it is slower than I would like! Educating the younger generation of cardiologists about the need to perform procedures and to focus on the patient is an important step forward.”

He sees his talk very much as a tribute to Andreas Grüntzig and thinks that its message is in line with the pioneer’s philosophy. “Interventional cardiologists are building on the early principles he used in the development of a procedure that culminated in the first successful balloon angioplasty technique and we are now applying them in a broader setting. If he were alive today, I think that Professor Grüntzig would be happy to see how the research he conducted over 40 years ago has generated the durable and meaningful advances evident in interventional cardiology today.”

**Don’t miss!**

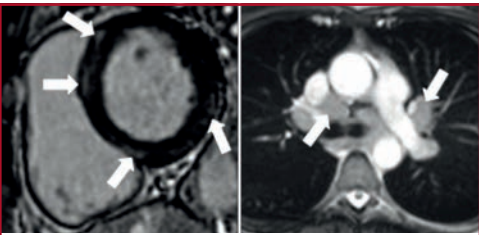
The ESC Andreas Grüntzig Lecture on Interventional Cardiology

Today, 10:05 - 10:40; Yerevan - Spotlight Village

## The ESC welcomes...



...254 newly elected FESC yesterday. The FESC title was first awarded to a group of distinguished cardiologists in 1988. Thirty years later, the ESC continues to recognise clinicians, scientists and nurses who have made an outstanding contribution to cardiology.




**What’s Your Diagnosis? Solution**


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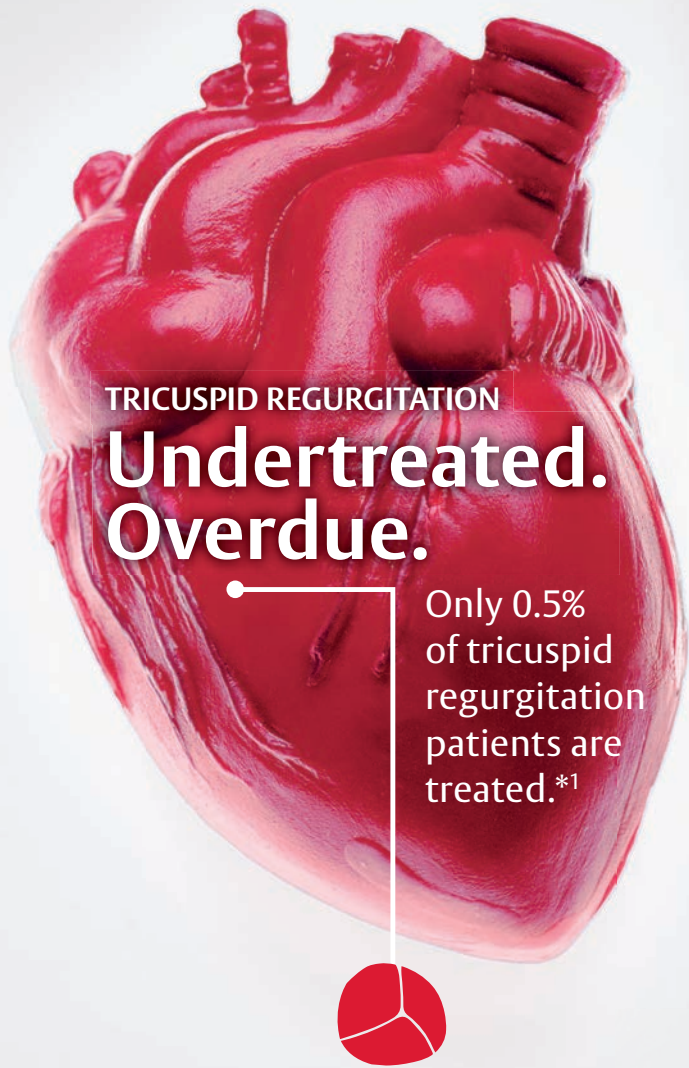
There is patchy mid-wall late gadolinium enhancement (arrows, left image) and also bilateral mediastinal lymphadenopathy (arrows, right image) consistent with cardiac involvement in sarcoidosis.

Kenneth Fung, Barts Heart Centre, London, UK  
Steffen Petersen, Barts Heart Centre, London, UK



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European Association of Cardiovascular Imaging





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\* Rate reflective of US data.  
1. Fender EA, et al. Isolated tricuspid regurgitation: outcomes and therapeutic interventions; *Heart*. 2017.

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# ESC Gold Medal Award winner

## Looking at the bigger picture



**Prof. Marc Pfeffer**

**ESC Gold Medal Award winner, Professor Marc Pfeffer (Brigham and Women’s Hospital, Harvard Medical School, Boston, Massachusetts, USA), is passionate about his work.**

He is the Dzau Professor of Medicine at Harvard Medical School and Senior Physician in the Cardiovascular Division at the Brigham and Women’s Hospital, with an extensive publication list and numerous awards to his name. These include the James B. Herrick Award and Clinical Research Prize from the American Heart Association (AHA), Distinguished Scientist Awards from both the AHA and the American College of Cardiology, and Lifetime Achievement Awards from both American and European Heart Failure Associations. His fascination with the heart began when he was a physiology graduate student with his late wife Janice Pfeffer.

“The functioning of the isolated heart captivated us,” he says. This attraction sparked a career that has changed the face of cardiovascular medicine. Citing his mentors, Professors Eugene Braunwald and Edward Frohlich, as major sources of career inspiration, Prof. Pfeffer is constantly motivated by the people around him. “Cardiovascular medicine has created a culture that encourages learning and the reshaping of practice. I am delighted to be part of such a community,” he says.

**“Physicians pride themselves on being the best doctor and giving the best therapy they can today.”**

One of his proudest achievements is leading the Survival And Ventricular Enlargement (SAVE) trial,<sup>1</sup> which in 1992 demonstrated that use of an angiotensin converting enzyme inhibitor (ACEi) could prolong survival and reduce the development of heart failure following myocardial infarction. In addition to improving patient prognosis, SAVE is particularly special since it was based on Janice’s basic investigations, and has made ventricular remodelling a therapeutic target for the discovery of new approaches to treating heart failure.

**“Researchers are not satisfied with today, looking to tomorrow and beyond to see how treatment can be improved.”**

“It is fascinating to see how discoveries have improved practice,” continues Prof. Pfeffer. “The outlook for patients with cardiovascular disease has improved dramatically, with the results of randomised, placebo-controlled clinical trials (RCTs) leading to practice changes. The RCT is our critical tool for determining the benefits, as well as the risks, of a therapeutic approach. The results are not always as expected and being a student of RCTs also teaches humility. These improvements generally do not come about as a quantum leap, but are the result of many small steps taken by dedicated researchers. This really impresses me. It is challenging enough to practise today’s medicine, let alone push the boundaries for change.” Prof. Pfeffer has also personally witnessed an improvement in the relationship between academia and industry. “We have moved on from what was considered the bad old days and have entered a new era characterised by transparency,” he explains. These changes, together with the move towards developing multidisciplinary cross-therapeutic area teams, should facilitate further progress.

What is the most important lesson Prof. Pfeffer has learned? “To play well with others!” he laughs. “Everything accomplished is not ‘I’, it’s ‘we’. I’m a ‘big picture’ person but I’ve been smart enough to work with ‘detail’ people. I consider myself really fortunate to be at such a top quality institution as the Brigham and Women’s Hospital where I have surrounded myself with the best people. On a daily basis, I am influenced and driven by a committed team and introduced to new ways of looking at issues by the younger generation of cardiologists and researchers coming through our institution.”

You don’t get to Prof. Pfeffer’s position by luck alone but he feels it has played a part. “Luck got me in the right place with the right people,” he says, explaining that, “My role as Principal Investigator on the SAVE trial led directly to opportunities to head up other trials and continue investigating potential new therapeutic approaches.” Prof. Pfeffer is now Principal Investigator on the 42-country PARADISE-MI trial—comparing combination angiotensin receptor-neprilysin inhibition with angiotensin-converting enzyme inhibition—in a similar patient population to SAVE. “This is a perfect example of how cardiovascular researchers are moving the field forward,” he says. “Twenty-five years after SAVE, we are now looking to see if we can do even better for these patients.”

If Prof. Pfeffer does have a concern for the future, it is that we may be forgetting the importance of the bigger picture. “As we become more and more specialised there may be a tendency to neglect the broader approach. With the increase in big data, we need to step back to make sure that statistically significant differences between treatments, which can be relatively small, are clinically relevant and to ask ourselves ‘What is best for the patient I am treating today?’”

1. Pfeffer MA, et al. N Engl J Med 1992;327:669–677.

# PFO closure: An interventional approach to risk reduction for recurrent stroke



**Dr. Iqbal Malik**

**There are approximately 1.5 million strokes per year across ESC member countries<sup>1</sup> and 800,000 strokes per year in the USA<sup>2</sup>, almost one-third of which are cryptogenic—that is, they have no obvious cause found.**

A patent foramen ovale (PFO) is present in up to 40% of these patients,<sup>2</sup> while the prevalence in the healthy population is around 20–25%. There has historically been controversy as to whether this is a causal factor. “It’s difficult to prove cause and effect; however, there is a massive association between PFO and cryptogenic stroke,” says Doctor Iqbal Malik (Hammersmith Hospital, Imperial College London, London, UK), who will be speaking at this afternoon’s session on the current status of PFO closure procedures (Sunday, 14:30 – 15:45; Brahms – The Hub).

**“There is now the evidence from three major trials that PFO closure does reduce the risk of recurrent stroke and that it should be offered to selected patients.”**

Percutaneous PFO closure via a catheter-based approach to reduce the risk of recurrent stroke has been available since the 1990s. However, previously published randomised controlled trials did not demonstrate superiority of device closure over

medical therapy (see reference 2). “Now though, with the recently available data from two further trials—CLOSE and REDUCE—and updated long-term results from the RESPECT trial,” explains Dr. Malik, “we do have evidence of the benefit of PFO closure.” A meta-analysis published recently in the *EHJ*, of which Dr. Malik is a co-author, included these latest trial data. It confirmed that, in selected patients with cryptogenic stroke, PFO closure is superior to medical therapy for the prevention of further stroke, particularly for patients with moderate-to-large shunts.<sup>2</sup>

So, which patients are most suitable for this intervention? “Selection of the right patients is paramount; it’s not a procedure that is appropriate for everyone,” clarifies Dr. Malik. “The patients in the trial had proven stroke and most had large shunts. Thus, an MRI scan to confirm the stroke is necessary, as is assessment of the size of the shunt with bubble contrast echocardiography or transcranial doppler. Those suitable for PFO closure tend to be younger, do not have diabetes or hypertension and are non-smokers,” he says. “Those who do have other cardiovascular risk factors should receive medical therapy instead. For example, there is good evidence for antiplatelets in those with carotid artery atherosclerotic disease, blood pressure lowering medications for hypertension, and anticoagulants in patients with atrial fibrillation (AF). Generally speaking, older patients (for example, aged over 60 years), should receive medical therapy; however, it’s important to consider biological age and individual fitness, not just chronological age.”

PFO closure is an invasive procedure and, as such, there are associated risks. “There’s a 1% chance of serious complications at the time of the intervention, such as stroke, heart attack and internal bleeding,” says Dr. Malik. Prior careful assessment of the

anatomy of the atrial septum is therefore necessary to minimise procedural-associated risks. As he explains, “Transoesophageal echocardiography will help verify whether there is an atrial septal aneurysm and confirm that there is a heart shunt and not a pulmonary shunt.” During the procedure, Dr. Malik uses a balloon across the PFO in order to more accurately assess the gap. “Not all cardiologists use a balloon, but I think it’s the best way to get information as to the size of the PFO and the shape of the tunnel, before selecting the device to use for closure.” Published trials have shown a low rate of procedural-related events—the highest (5.9%) was in the CLOSURE-1 trial, which used the StarFlex device that has since been withdrawn.<sup>2</sup> “Currently available devices are associated with a short-term risk of AF, palpitations, etc, but this usually settles within a few weeks and stroke reduction has been proven despite the AF occurring,” he explains.

In considering PFO closure vs medical therapy, Dr. Malik emphasises the importance of balancing the benefits with the risks. “I always explain that it’s a ‘belt and braces’ approach to risk reduction. Overall, by undergoing PFO closure a patient will have their risk of a recurrent stroke reduced from approximately 1% to 0.5%; so, although the relative risk reduction is 50%, the actual numbers are small. However, the majority of younger patients who have had a stroke with no obvious cause want to do all they can to reduce the chances of recurrence. We have the technique available—and also now the evidence to show that it is effective—and after two years the 1% risk of the procedure itself has been offset and the patient has a net gain.”

1. Atlas Writing Group. Eur Heart J 2018;39:508–579.  
2. Ahmad Y, et al. Eur Heart J 2018;39:1638–1649.



# CANTOS - one year on: What have we learned?



**Dr.  
Paul Ridker**

**At ESC Congress 2017, results from the CANTOS trial provided the first evidence that antiinflammatory therapy with canakinumab, targeting the interleukin (IL)-1 $\beta$  pathway, leads to significant reductions in recurrent cardiovascular events.<sup>1</sup>**

Importantly, reductions in cardiovascular events were of a similar magnitude to those seen following aggressive low-density lipoprotein cholesterol (LDL-C) lowering with proprotein convertase subtilisin/kexin type 9 (PCSK9) inhibitors. We now know that LDL-C lowering and inflammation inhibition are completely independent and results from CANTOS, the first trial to specifically target inflammation, represent a remarkable advance in the atherosclerosis research world.

Since ESC Congress 2017, the cardiovascular benefit of canakinumab has been shown to be directly related to the magnitude of inflammation reduction measured by on-treatment high-sensitivity C-reactive protein levels.<sup>2</sup> Further to this, analyses on the relationship between the magnitude of canakinumab benefit and on-treatment levels of IL-6 have been conducted and will be presented as a Clinical Trial Update today (11.00 - 12.30 in Brahms - The Hub) and simultaneously published in the *EHJ*.

**“The initial CANTOS findings have opened the floodgates to a wide range of new investigations.”**

The striking effect of IL-1 $\beta$  inhibition on lung cancer incidence has also been further evaluated<sup>3</sup> and investigations are ongoing to understand how these cancer-lowering effects may be integrated into anti-cancer treatment regimens. In another particularly interesting observation, canakinumab demonstrated reductions in cardiovascular events among patients with chronic kidney

disease, a group at very high risk in whom LDL-C lowering appears ineffective and in whom inflammation likely plays an important role in accelerated atherosclerosis.<sup>4</sup> Further studies of canakinumab in patients with severe renal failure or dialysis are planned.

Over the past year, the CANTOS Investigator Group has been able to present updates that have made researchers re-evaluate many mechanisms of disease. A year on, data from CANTOS continues to have wide implications for both clinical care and the future of atherosclerosis research.

- 1. Ridker PM, et al. *N Engl J Med*. 2017;377:1119-1131.
- 2. Ridker PM, et al. *Lancet*. 2018;391:319-328.
- 3. Ridker PM, et al. *Lancet*. 2017;390:1833-1842.
- 4. Ridker PM, et al. *J Am Coll Cardiol*. 2018;71:2405-2414.

**Don't miss!**

New data from CANTOS in the 'Innovative strategies for secondary prevention' session (08.30 - 10.00 in *Minsk - Spotlight Village*) and in the 'Clinical Trial Updates' session (11.00 - 12.30 in *Brahms - The Hub*).



## The Tour de Coeur arrives at the heart of cardiology once again

**Thousands of delegates have flown from all over the globe to attend the world's largest conference in cardiovascular medicine, but the now-famous group of Swiss cardiologists cycled 600 km to Munich.**

In its eighth year, the annual Tour de Coeur sees Swiss delegates cycle from Geneva to the ESC Annual Congress venue to promote the importance of physical activity.

Professor Bax said, "Congratulations to our Swiss cardiology friends on another cycling adventure to ESC Congress 2018. We look forward to seeing them again after their own Tour de France next year!"

**ACTELION SATELLITE SYMPOSIUM**  
**SUNDAY, 26 AUGUST 2018, 13:00 – 14:00**  
**ROOM ALGIERS – VILLAGE 3**  
**Achieve more in PAH – Translating insights into patient benefits, Volume 1**

**Marius M. Hoeper (Co-Chair), Hannover, Germany**  
**Irene Lang (Co-Chair), Vienna, Austria**  
**Nazzareno Galiè, Bologna, Italy**  
**Jean-Luc Vachiéry, Brussels, Belgium**

**ACTELION SATELLITE SYMPOSIUM**  
**MONDAY, 27 AUGUST 2018, 13:00 – 14:00**  
**ROOM BRUSSELS – VILLAGE 4**  
**Achieve more in PAH – Translating insights into patient benefits, Volume 2**

**Stephan Rosenkranz (Co-Chair), Cologne, Germany**  
**Adam Torbicki (Co-Chair), Otwock, Poland**  
**Fabrice Bauer, Rouen, France**  
**Vallerie McLaughlin, Ann Arbor, USA**



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# Sessions of the day

<b>7:30</b>	
<b>Bach</b>	General cardiology crash course – part 1
<b>Beethoven</b>	Controversial issues in non-ischemic cardiomyopathies
<b>Brahms</b>	How – and when – to eat right
<b>Haendel</b>	Cardiovascular disease and rheumatoid arthritis
<b>Schumann</b>	The failing tricuspid valve – Treatment options

<b>8:30</b>	
<b>Munich</b>	ESC 2018 Guidelines Overview
<b>Centre Stage</b>	Live in the Box: TAVI beyond the tricuspid high-risk elderly
<b>Bach</b>	Acute emergencies for the young cardiologist
<b>Beethoven</b>	Take the Challenge! The European Exam on General Cardiology (EEGC)
<b>Brahms</b>	Highlights from the New England Journal of Medicine: Editors’ Choice
<b>Haendel</b>	Ischemic stroke – From prevention to catheter intervention
<b>Schumann</b>	Current controversies in clinical trial design
<b>Ankara</b>	Coronary intervention: Hot Topics in 2018
<b>Minsk</b>	Innovative strategies for secondary prevention
<b>Belgrade</b>	Expert Advice - Management of pulmonary embolism
<b>Cairo</b>	The valve or the ventricle? A key question in mitral regurgitation
<b>Tirana</b>	Imaging for valve interventions
<b>Damascus</b>	Adipose tissue and cardiovascular disease
<b>Bern</b>	Lipid-lowering therapy beyond LDL Cholesterol
<b>Bratislava</b>	The year in hypertension - Hot papers 2017/2018
<b>Vienna</b>	Easy to measure, hard to understand: a review of left ventricular strain in echocardiography
<b>Brussels</b>	Impact of gut microbiota on cardiovascular disease
<b>Ljubljana</b>	Emerging concepts of calcium signalling - From cells to clinics
<b>Baku</b>	Advanced heart failure - Best advice to treat critically ill patients
<b>Kiev</b>	Atrial fibrillation in 2018
<b>Tunis - Library Room</b>	Device-detected and subclinical atrial tachyarrhythmias
<b>Madrid</b>	Cardiac arrhythmias: review, update, and State of the Art in 2018
<b>Stockholm</b>	Young Investigator Award Session Population Sciences
<b>Moscow</b>	Young Investigator Award Session Clinical Cardiology
<b>Agora 1</b>	Cardiac troponins: starting levels and outcomes
<b>Agora 2</b>	Exploring biomarkers in heart failure
<b>Digital Health Stage</b>	Digital health in clinical practice
<b>Science Box 1</b>	The cardiac consult in Stroke
<b>Science Box 2</b>	Pathogenesis of pulmonary hypertension
<b>San Marino</b>	Unsettled issues in severe aortic stenosis
<b>Copenhagen</b>	Blood pressure, arterial phenotype and risk
<b>Algiers</b>	Emerging CMR technologies

<b>9:00</b>	
<b>Yerevan</b>	Young Investigator Award Session Valvular Heart Disease

<b>9:30</b>	
<b>Stockholm</b>	ESC Geoffrey Rose Lecture on Population Sciences
<b>Moscow</b>	ESC Rene Laennec Lecture on Clinical Cardiology

<b>10:05</b>	
<b>Yerevan</b>	ESC Andreas Grüntzig Lecture on Interventional Cardiology
<b>Centre Stage</b>	The European Heart Journal's advances from prevention to intervention: the year in Cardiology
<b>Digital Health Stage</b>	Apps

<b>10:15</b>	
<b>Bach</b>	New opportunities for treating heart failure through fixed dose combinations - Experts on the Spot organised by SERVIER
<b>Beethoven</b>	Reducing premature cardiovascular mortality in patients with type 2 diabetes: best practice in cardiology Satellite - Experts on the Spot organised by Boehringer Ingelheim & Eli Lilly and Company Diabetes Alliance
<b>Brahms</b>	Emerging evidence-based approaches to reduce residual atherosclerotic risk - Experts on the Spot organised by Novartis
<b>Haendel</b>	Anticoagulation in challenging circumstances - Translating the real world evidence data for your multi-morbid patients with atrial fibrillation - Experts on the Spot organised by Bayer AG
<b>Schumann</b>	Uninterrupted NOACs in atrial fibrillation ablation: what have we learned from the clinical trials? - Experts on the Spot organised by Boehringer Ingelheim

<b>11:00</b>	
<b>Munich</b>	2018 ESC/ESH Guidelines on Arterial Hypertension
<b>Centre Stage</b>	Live in the Box: left atrial appendage closure
<b>Bach</b>	Expert Advice - Cardiogenic shock during an ICU night shift – preparing for the worst to get the best
<b>Beethoven</b>	The great debate: thrombocardiology post COMPASS.
<b>Brahms</b>	Clinical Trial Updates
<b>Haendel</b>	Special issues from the 2017 ESC Guidelines on valvular heart disease in general cardiology
<b>Schumann</b>	Meet the Experts - Safety first: avoiding adverse events with new cardiovascular drugs
<b>Digital Health Stage</b>	eCardiology - State of the Heart
<b>Ankara</b>	Revascularisation in stable CAD: the holy grail or overused?
<b>Minsk</b>	The tricuspid valve in congenital heart disease – An update
<b>Belgrade</b>	Rheumatic heart disease: a global problem
<b>Yerevan</b>	Expert Advice - Specific challenges in pulmonary arterial hypertension associated with congenital heart disease
<b>Cairo</b>	Tips, Tricks and Pearls in percutaneous coronary intervention
<b>Tirana</b>	Prevention and management of stroke: an interdisciplinary challenge
<b>Damascus</b>	Patient engagement: a new frontier or a road well travelled?
<b>Bern</b>	Diabetes for the Cardiologist: integrated Cardio-Metabolic Care of Tomorrow
<b>Stockholm</b>	Cardio-oncology: emerging concepts, challenges and clinical opportunities
<b>Algiers</b>	The "Top Ten" Diagnostic Pitfalls

<b>Ljubljana</b>	Atrial fibrillation - Not all quiet on the molecular front
<b>Baku</b>	Science and Fiction in heart failure
<b>Moscow</b>	Heart failure - The "Big Picture"
<b>Kiev</b>	Cardiac device therapy: review, update, and State of the Art in 2018
<b>Tunis - Library Room</b>	Leaflet thrombosis following bioprosthetic valve replacement: storm in a teacup?
<b>Brussels</b>	Young Investigator Award Session Basic Science
<b>Agora 1</b>	Shear stress, spasm and vulnerable plaque
<b>Agora 2</b>	Atrial fibrillation - Detection, treatment, outcomes
<b>Science Box 1</b>	Outcome of coronary stenting up to 10 years
<b>Science Box 2</b>	Atrial Fibrillation in hypertrophic cardiomyopathy
<b>San Marino</b>	The value of risk scores for assessment in acute coronary syndrome
<b>Bratislava</b>	Lifestyle choices and blood pressure
<b>Copenhagen</b>	Device based therapy in hypertension
<b>Vienna</b>	Nuclear perfusion imaging: "back to the future"
<b>Madrid</b>	Stroke prevention in atrial fibrillation

<b>12:00</b>	
<b>Brussels</b>	ESC William Harvey Lecture on Basic Science

<b>12:30</b>	
<b>ESC TV Stage</b>	Stent Pioneer Richard A. Schatz

<b>12:45</b>	
<b>Agora 1</b>	Social media for the cardiologist
<b>Agora 2</b>	The health care systems facing the challenge of an ageing community. The endeavor of next decades cardiovascular practice
<b>Digital Health Stage</b>	The effect of regulation on innovation

<b>13:00</b>	
<b>Haendel</b>	Discussion: Glucagon-like peptide-1 receptor agonists and changing paradigms in clinical practice - Experts on the Spot organised by Novo Nordisk A/S
<b>San Marino</b>	Acoustic pulse thrombolysis treatment for pulmonary embolism patients: rationale, experience and data - Satellite Symposium organised by EKOS Corporation
<b>Centre Stage</b>	The number 3 – Perfection? The ideal synthesis even in stable angina management - Satellite Symposium organised by Menarini
<b>Bach</b>	Who needs aspirin? Finding your patient in the world's guidelines - Satellite Symposium organised by Bayer AG
<b>Beethoven</b>	Deliver outcomes that matter to patients - Connected imaging to treat the complex valves - Satellite Symposium organised by Siemens Healthineers
<b>Brahms</b>	The role of the implantable loop recorder in the 2018 ESC Syncope Guidelines- Satellite Symposium organised by Medtronic
<b>Schumann</b>	Current minimally-invasive treatment modalities for heart valve diseases : what is next? - Satellite Symposium organised by Edwards Lifescience
<b>Ankara</b>	Residual cardiovascular risk after an acute coronary syndrome: identifying, stratifying and managing patients at long term risk of atherothrombotic cardiovascular events - Satellite Symposium organised by AstraZeneca
<b>Minsk</b>	Biomarker-based approaches for improved atrial fibrillation management- Satellite Symposium organised by Roche
<b>Belgrade</b>	Seize the moment to optimize treatment for each patient with heart failure: why, when, and how - Satellite Symposium organised by Novartis
<b>Cairo</b>	Assessing atherosclerosis: risks, goals and strategies to minimize cardiovascular risk post-myocardial infarction - Satellite Symposium organised by MSD
<b>Damascus</b>	Cardiovascular risk reduction and the role of lipoprotein(a): present and future therapeutic options - Satellite Symposium organised by Cleavland
<b>Bern</b>	Oral anticoagulation in atrial fibrillation - From evidence-based medicine to daily clinical practice - Satellite Symposium organised by Daiichi Sankyo
<b>Stockholm</b>	Advances and investigational devices in heart failure - Satellite Symposium organised by Medtronic
<b>Bratislava</b>	Optimising cardiovascular outcomes with PCSK9 inhibitors: start now before a potential next MI or stroke! - Satellite Symposium organised by Amgen Europe GmbH
<b>Algiers</b>	Achieve more in pulmonary arterial hypertension - Translating insights into patient benefits, Volume 1 - Satellite Symposium organised by Actelion Pharmaceuticals Ltd
<b>Brussels</b>	Witness a big leap in patient care thanks to echo - Satellite Symposium organised by Philips Healthcare
<b>Ljubljana</b>	Saving lives beyond adherence - Satellite Symposium organised by Ferrer
<b>Baku</b>	Rivaroxaban in cardiovascular protection - Getting to the heart of the matter - Satellite Symposium organised by Bayer AG
<b>Moscow</b>	Treating angina: the way forward - Satellite Symposium organised by SERVIER
<b>Kiev</b>	Translating trials to clinical practice: is dual therapy the new standard of care for atrial fibrillation patients post-PCI? - Satellite Symposium organised by Boehringer Ingelheim
<b>Madrid</b>	New concepts in vascular protection: exploring the role of antithrombotic therapy - Satellite Symposium organised by Medscape

<b>14:30</b>	
<b>Munich</b>	Hot Line Session 1
<b>Centre Stage</b>	Meet the Experts - PCI of complex bifurcations



<b>Beethoven</b>	Dual antiplatelet therapy and PCI - Important controversies
<b>Brahms</b>	Closing in on PFOs: the current status of patent foramen ovale closure procedures
<b>Haendel</b>	Emergencies in out of hospital settings - Practical easy rules
<b>Schumann</b>	Pathology for cardiac imaging of usual and unusual cardiomyopathies
<b>Digital Health Stage</b>	Key steps to innovation in medical devices
<b>Ankara</b>	Hot topics in cardiopulmonary resuscitation
<b>Minsk</b>	Guidelines in Daily Practice - DAPT
<b>Belgrade</b>	An update on the management of mitral valve stenosis
<b>Yerevan</b>	Interventional treatment of valve disease in congenital heart disease patients
<b>Damascus</b>	Guidelines in Daily Practice - STEMI
<b>Bratislava</b>	Expert Advice - How not to miss secondary hypertension
<b>Algiers</b>	2018 Imaging updates: recommendations and scientific initiatives
<b>Vienna</b>	Image Interpretation with the Masters: Echocardiography
<b>Brussels</b>	New strategies for diagnosis and treatment in dilated cardiomyopathy
<b>Ljubljana</b>	The promise of RNA-based therapeutics and diagnostics
<b>Baku</b>	Heart failure: review, update, and State of the Art in 2018 - Part 1 (Diagnosis and drug treatment)
<b>Moscow</b>	Expert Advice - How to prevent readmissions in patients with acute heart failure
<b>Kiev</b>	Late Breaking Science in Arrhythmias and EP
<b>Tunis - Library Room</b>	CANTOS one year after - A critical review: inflammation and CAD prevention
<b>Madrid</b>	Guidelines in Daily Practice - Atrial fibrillation
<b>San Marino</b>	Young Investigator Award Session Thrombosis
<b>Bach</b>	Best - Awards session
<b>Agora 1</b>	Risk stratification in congenital heart disease
<b>Agora 2</b>	Catheter ablation for ventricular arrhythmias
<b>Science Box 1</b>	Safety issues with anti-platelets drugs
<b>Science Box 2</b>	Can speckles track clinical outcomes?
<b>Cairo</b>	Maintenance of anti-thrombotic therapy after TAVI
<b>Tirana</b>	No-reflow and prevention pathophysiology
<b>Bern</b>	Sex-related differences in the outcomes of cardiovascular interventions
<b>Stockholm</b>	Something old, something new: Biomarkers and cardiovascular risk assessment
<b>Copenhagen</b>	Sex, drugs and blood pressure control

<b>15:50</b>	
<b>Centre Stage</b>	Meet the Task Force of the 2018 ESC/ESH Guidelines on Arterial Hypertension
<b>Digital Health Stage</b>	Artificial Intelligence: Decision Support & Voice Interaction
<b>Tunis - Library Room</b>	Physician Burnout: Issues for Cardiologists
<b>15:55</b>	
<b>ESC TV Stage</b>	Meet the trialist - MARINER
<b>16:00</b>	
<b>Bach</b>	What if angina recurs after coronary revascularisation? - Experts on the Spot organised by SERVIER
<b>Beethoven</b>	Residual cardiovascular risk after an acute coronary syndrome: identifying, stratifying and managing patients at long term risk of atherothrombotic cardiovascular events - Experts on the Spot organised by AstraZeneca
<b>Brahms</b>	Setting the COMPASS into new directions - Who will benefit most in coronary artery disease? - Experts on the Spot organised by Bayer AG
<b>Haendel</b>	Seize the moment to optimize heart failure treatment: why, when, and how? Ask the experts - Experts on the Spot organised by Novartis
<b>Schumann</b>	Bringing order to complexity: antithrombotic regimens for atrial fibrillation patients who underwent percutaneous coronary intervention - Experts on the Spot organised by Boehringer Ingelheim
<b>16:20</b>	
<b>ESC TV Stage</b>	Meet the trialist - CAMELLIA-TIMI 61
<b>16:45</b>	
<b>Munich</b>	Hot Line Session 2
<b>Centre Stage</b>	Symptomatic severe aortic stenosis - A transcatheter approach for all?
<b>Beethoven</b>	The Great Cardiovascular Quiz
<b>Brahms</b>	Women in Cardiology: Bridging the Gap
<b>Haendel</b>	LDL goals and inflammation. From basic science to clinical practice.
<b>Schumann</b>	LAA Occlusion - The next big thing?
<b>Digital Health Stage</b>	Expert Advice - How to integrate imaging in computerized decision support systems in cardiology
<b>Ankara</b>	Expert Advice - Antithrombotic therapy after acute coronary syndromes
<b>Belgrade</b>	The clot on the hotspot: an update on acute and chronic venous thromboembolism

<b>Cairo</b>	Image Interpretation with the Masters: OCT, IVUS, FFR
<b>Tirana</b>	Rapid fire debates in carotid disease
<b>Bern</b>	Managing coronary artery disease: Challenges in the "80+" generation
<b>Stockholm</b>	Nursing and Allied Health Professions Investigator Award
<b>Bratislava</b>	Expert Advice - How to measure blood pressure
<b>Copenhagen</b>	Expert Advice - Motivating patients to exercise
<b>Algiers</b>	Advanced echocardiography in clinical practice
<b>Vienna</b>	Image Interpretation with the Masters: Left ventricular hypertrophy
<b>Ljubljana</b>	Time for cell-free approaches in cardiac regeneration
<b>Baku</b>	Heart failure: review, update, and State of the Art in 2018 - Part 2 (Treatment)
<b>Kiev</b>	ESC/EORP Late Breaking Registry Results
<b>Tunis - Library Room</b>	T1 and T2 Mapping in cardiac magnetic resonance - The new kid on the block is here to stay
<b>Madrid</b>	A Short Session on the Long QT Syndrome
<b>Bach</b>	Failing hearts: mission impossible?
<b>Agora 1</b>	Cardiomyopathy in Fabry disease
<b>Agora 2</b>	There is no sweet spot in diabetes
<b>Science Box 1</b>	Heart failure with mid-range ejection fraction: the controversy continues
<b>Science Box 2</b>	Advancements in nuclear cardiology
<b>Minsk</b>	The ECG in Acute Coronary Syndromes
<b>Yerevan</b>	Long term outcome in congenital heart disease - new insights from large registries
<b>Damascus</b>	Advances in coronary surgery
<b>San Marino</b>	Weather conditions, air pollution and coronary artery disease
<b>Brussels</b>	Inflammation in reperfusion and remodelling
<b>Moscow</b>	Young Investigator Award Session Coronary Pathophysiology and Microcirculation

<b>18:15</b>	
<b>Cairo</b>	Hyperuricemia : a key player in multisystemic diseases - Satellite Symposium organised by Menarini
<b>Moscow</b>	Simple solutions to ensure efficacy in high cardiovascular risk patients- Satellite Symposium organised by SERVIER
<b>Baku</b>	Advances in anticoagulation to improve patient care in atrial fibrillation - Satellite Symposium organised by Pfizer

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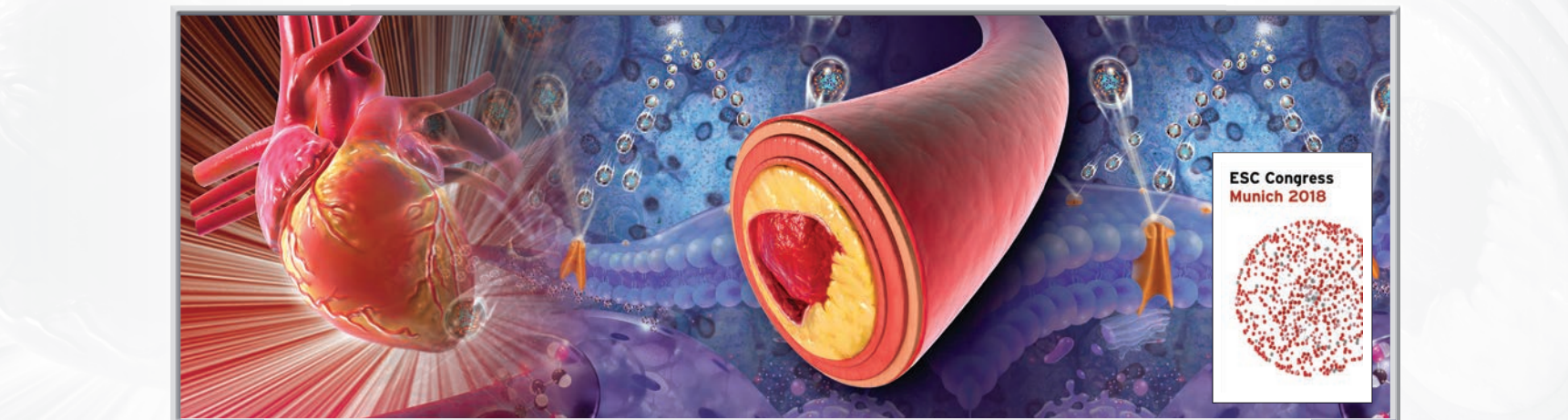
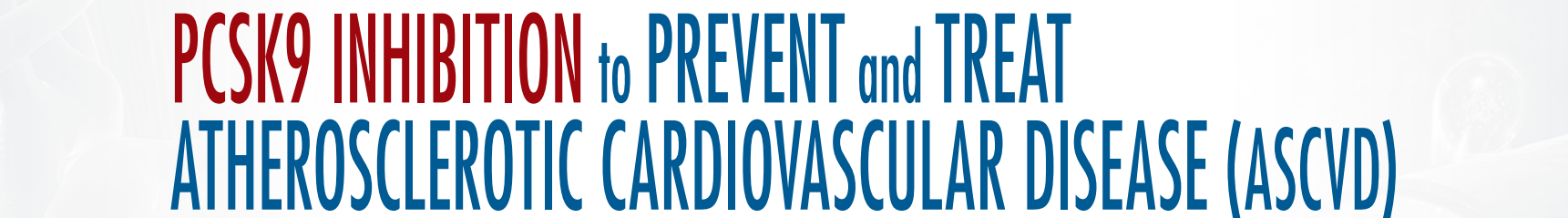
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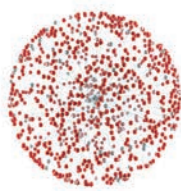
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## Today

in the ESC Professional Members' Lounge



10:00 - 10:30	Meet the European Heart Academy Team
10:30 - 10:45	How can Enago help you in your publication goals?
11:00 - 11:15	Hands-on the new ESC 365
11:15 - 12:00	ESC Congress - Behind the Scenes Tour
11:30 - 12:00	ESC Clinical Case Gallery Case of the month collaboration with EHJ Case Report Journal
12:30 - 13:00	ESC Publications Meet The Editor: Tom Lüscher
13:00 - 13:30	Find out more about ESC Grants
15:00 - 15:30	Discover the ESC eLearning Platform
15:30 - 16:30	Professional Horizons For registered participants. Seek career advice from experts in cardiology.
15:30 - 16:00	Upgrade your Social Media & Hands-On
16:00 - 16:15	How can Enago help you in your publication goals?
16:30 - 16:45	Hands-on the new ESC 365
17:00 - 18:00	Emeritus Fellows of the ESC Meet Young Cardiologists
18:00 - 19:00	Women in ESC Networking Event

# Evolution of left atrial appendage occlusion therapy - where are we now?



Prof.  
Ted Feldman

**The left atrial appendage (LAA) is the main source of thromboembolism in patients with nonvalvular atrial fibrillation (AF). Percutaneous LAA occlusion therapy has emerged as an alternative to oral anticoagulants in selected patients, with many important advances in the decade since the first randomised controlled trial was conducted.**

Procedural and long-term follow-up data are now available for the WATCHMAN device, with several large registry reports providing outcomes data regarding use of several types of devices in a real-world setting. LAA occluders have themselves evolved and several devices are in the clinical investigational pipeline.

With a greater understanding of LAA size and morphology and how this affects stroke risk and procedure success, the most appropriate candidates and the most appropriate closure strategies are being better defined. Regarding imaging advances, it has been recognised that cardiac computed tomography can play an important role in defining the patient's LAA anatomy before the procedure as

either an alternative or a supplement to transoesophageal echocardiography (TOE). In addition, improvements in intracardiac echocardiography may allow guidance during the procedure without the need for general anaesthesia and TOE imaging in selected cases.

**"Not only the LAA occlusion technologies but also the techniques have improved in recent years," says Professor Feldman.**

The accrual of real-world data from registries has allowed greater scrutiny of the incidence of periprocedural complications, such as device-related thrombus. As a result, a new wave of trials to study post-procedure anticoagulation approaches is underway. These trials highlight the need for continued evolution of LAA occlusion therapies, with optimisation of pre-/intra-/post-procedural imaging, patient selection and post-procedural antiplatelet and anticoagulation therapy to achieve more favourable outcomes.

### Don't miss!

Live in the Box: Left Atrial Appendage Occlusion  
Today, 11.00 - 12.30 in Centre Stage - The Hub

## ESC Geoffrey Rose Lecture on Population Sciences

# Stroke prevention in atrial fibrillation



Dr.  
Stuart Connolly

**Approximately 20% of all ischaemic strokes are directly caused by atrial fibrillation (AF). Importantly, strokes that arise from AF-related clots are particularly large and are a major cause of death and disability.**

"We have made tremendous advances in understanding the cause of strokes in patients with AF and also in developing treatments that can reduce the risk; nevertheless, it's still a big problem," says Doctor Stuart Connolly (McMaster University, Hamilton, Ontario, Canada), who will today give the ESC Geoffrey Rose Lecture on Population Sciences (Sunday, 09:30 - 10:00; Stockholm - Village 1). "There has been much progress in understanding the role of anticoagulant medication for stroke

prevention, but we have recently learned that there may be better ways to prevent stroke in patients with AF," he continues. "Treatments such as combination therapy with anticoagulants and aspirin, left atrial appendage (LAA) occlusion and new devices that are being tested show great promise."

**"Recent findings suggest there may be better ways than anticoagulation therapy to prevent stroke in AF."**

The Left Atrial Appendage Occlusion Study (LAAOS) III, of which Dr. Connolly is Study Chair, is the largest trial to date to explore the efficacy of LAA occlusion for stroke prevention. This international trial will randomise 4,700 patients with AF, in whom cardiac surgery is planned, to undergo LAA occlusion or no LAA occlusion. The results will inform future clinical practice regarding stroke prevention in AF.<sup>1</sup>

"Silent, or subclinical, AF has also recently been shown to be a potentially important cause of stroke," says Dr Connolly. "This is a promising research area, because it may help us to prevent stroke in patients who are not aware that they have AF. We need to understand just how important it is; do we need to treat it, and how can we best detect it?" So much progress in stroke prevention has been made in the last three decades; the question is where do we go from here?

1. Whitlock R, et al. Ann Cardiothorac Surg 2014;3:45-54.



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## Healthy Hearts for Munich

With the help of a giant walk-in heart, the latest information on food and exercise and one-to-one consultation, the ESC and the German Heart Foundation (Deutsche Herzstiftung) helped people of all ages to learn more about their cardiovascular health in yesterday's Healthy Hearts for Munich public event.



# How can cardiologists optimise social media?

Consider the global reach of the most-used social media platforms– Twitter, LinkedIn, Facebook, Instagram, YouTube–and it's easy to see how social media has become so powerful. In this afternoon's session 'Social media for the cardiologist' (Sunday, 12:45 - 13:45; Agora 1 - Agora), we explore how cardiologists can take advantage of this ever-present influence to connect with colleagues, share and gain knowledge and help with day-to-day decision making in their clinical practice.

There's no denying the amount of time that people spend on social media, whether it be connecting with colleagues on LinkedIn, checking Facebook, Twitter or sharing photographs and videos via Instagram and YouTube, so why should busy cardiologists engage with it? As Shelley Wood, Managing Editor of TCTMD and Editorial Director at the Cardiovascular Research Foundation, New York, USA, who co-chairs today's session explains, "Cardiologists can really use social media in different ways, depending on the medium they get involved with. People typically say that social media is a waste of time, but I think users can set their own parameters and spend as much or as little time on it as they choose."

So, what can cardiologists get out of social media? "It's a good way to connect with colleagues who are passionate about the same topics and to keep up to date with current research," says Ms. Wood. "A recent survey

carried out by TCTMD<sup>1</sup> that looked at how our subscribers learn revealed that almost a third of respondents regularly browse social media. Of those with a Twitter account, 64% say they are using it to learn about new developments in their field of interest," she says.

Facebook and LinkedIn are helpful for cardiologists in staying connected with colleagues and keeping up to date with new developments. However, Twitter is arguably the most useful platform as it is the most dynamic. Ms. Wood adds, "For those who see social media as a 'time-sink', it's possible to use Twitter passively, in that it's not always necessary to engage in discussions. By using hashtags, such as #cardiotwitter, #cardiology, #AFib and #TAVR for example, tweets can be categorised in a way that makes it easy for users to find and follow tweets about a specific topic."

What about other ways that cardiologists can use social media? "Twitter in particular can be used as a 'crowd source' and many find it to be a good way of raising awareness of newly published studies, patient recruitment for clinical trials that are enrolling, or to assist with day-to-day decision-making, such as asking for help with their cases. For example, seeking tips on patient care or asking for alternative approaches to problems, dosing strategies or, particularly in interventional cardiology, specific techniques to use," continues Ms. Wood. "Also, I read an interesting thread on Twitter recently that discussed failures–cardiologists were reaching out to others who had had the same setbacks with their cases and sharing ideas and advice."



There is clearly a need to be sensitive when posting images, angiograms, CT scans, etc., to ensure that patients cannot be identified from the information being shared. Are there any other pitfalls? "Well, there is a tendency for users to behave differently online than they would do outside of social media," highlights Ms. Wood. "People are likely to be more outspoken on social media than they would be in person, and I would caution against that. As a rule of thumb, you shouldn't say anything on social media that you wouldn't also say to someone face to face."

The growth of social media over the last 10-15 years has been incredibly rapid, so where next for cardiology? Will dedicated social media sites for physician audiences only be of interest, and what would be the pros and cons of closed platforms, accessible only to those who fully understand the content? "Social

media is based on the concept of openness and sharing, but we are already seeing social platforms evolve that are restricted to medical doctors or subspecialties. It's not clear whether those help keep conversations focused, or whether they deter out-of-the-box thinking and problem solving," says Ms. Wood. Whatever developments await us in the future, it is clear that social media is the present–so, why not embrace it and see what it can do for you?

1. 2018 TCTMD Learning Survey. Available at [www.tctmd.com/news/we-asked-you-answered-learning-numbers](http://www.tctmd.com/news/we-asked-you-answered-learning-numbers).

**Don't miss!**

Social media for the cardiologist  
12:45 - 13:45; Agora 1 - Agora

## Training future leaders in arrhythmia: DAS-CAM

One of the key needs identified by the ESC is the training of future leaders. For this purpose, a unique 2-year educational programme entitled 'Diploma of Advanced Studies in Cardiac Arrhythmia Management (DAS-CAM)' has been established in a collaboration initiative involving the European Heart Academy (EHA), the European Heart Rhythm Association (EHRA) and Maastricht University Medical Center.

When asked about DAS-CAM, current participant, Doctor Daniel Scherr (Medical University of Graz, Graz, Austria) said, "Most medical education programmes focus on making you a better doctor, which is a great thing, but this multidisciplinary diploma covers many other aspects, including statistics, health economics, leadership and presentation skills–the full scale of what you need today to succeed in your interactions with patients but also with the administration, colleagues and at congresses." DAS-CAM graduates will have a solid understanding of both the content and context of the field, with the global dimension needed to prepare them for future leadership.

Dr. Scherr continued, "Participants all bring their individual experience into the group, but then we become students again and are being taught by the best-of-the best in a world-class faculty. As a group, we have become friends and will stay connected as an international network for a lifetime." In total, 32 individuals from 18 different nationalities are currently participating in the first DAS-CAM intake. The second DAS-CAM intake is now open for applications–the programme will start in January 2019, with an application deadline of 15 September, 2018.

### Abstract of the day:

## Link between forehead wrinkles and cardiovascular death

**The physical signs of ageing, such as male pattern baldness, earlobe creases and xanthelasmata, have been associated with cardiovascular (CV) death. While the exact reason for the link is unknown, the association is independent of chronological age and typical CV risk factors.<sup>1</sup>**

As an additional feature of ageing, Doctor Yolande Esquirol (Paul Sabatier University – Inserm – CHU, Toulouse, France) and colleagues investigated a possible association between forehead wrinkles and all-cause and CV deaths (Abstract 85605). Today, Dr. Esquirol will present the fascinating results of the study. In a cohort of 3,221 volunteers aged 32, 42, 52 and 62 years at the time of examination, forehead wrinkles were clinically assessed for their number and depth. Wrinkle assessment scores were assigned, ranging from 0 (no wrinkles) to 3 (numerous deep wrinkles). The cohort was followed over a 20-year period.

During follow-up, 233 (7%) volunteers had died, with a significantly lower incidence of death (2.1%) in those with a wrinkle score of 0 compared with 6.6% in those with a score of 1 and 15.2% in those with a score of 2&3 (p<0.001). Dr. Esquirol says, "When we analysed the data using a Kaplan-Meier survival curve, we found a significantly higher cumulative incidence of death over time in the individuals given a wrinkle score of 2&3



compared with those given a lower score. In fact, the risk of all-cause mortality was six-fold greater in those with a wrinkle score of 2&3 compared with a score of 0, and this was double the risk compared with individuals given a score of 1. These differences were non-significant when multivariate adjustments were made." However, when data were analysed specifically for CV death, there remained a significant association with forehead wrinkles, regardless of age, gender, education, smoking, systolic blood pressure, heart rate, diabetes and dyslipidaemia.

It is hypothesised that: 1) the mechanisms involved in wrinkle development are similar to those of atherosclerosis, notably those concerning oxidative stress and alteration of collagen protein; or, 2) the vessels in the forehead are tiny and may be more sensitive to atherosclerosis, and so these wrinkles could be one of the early signs of vessel aging. Further studies may reveal the reason for the association between CV death and the number and depth of forehead wrinkles, which appears to be independent of chronological age and CV risk factors.

1. Christoffersen M, Tybjaerg-Hansen A. Ageing Res Rev 2016;25:24-41.



# CULPRIT-SHOCK: One year results support Guidelines change



**Dr. Holger Thiele**

**Results from a one-year follow-up of the CULPRIT-SHOCK study, presented yesterday by Doctor Holger Thiele (Heart Center Leipzig at University of Leipzig, Leipzig, Germany) and simultaneously published in the New England Journal of Medicine,<sup>1</sup> confirmed that culprit-lesion-only percutaneous coronary intervention (PCI) is preferred to immediate multivessel PCI for patients with acute myocardial infarction (MI) complicated by cardiogenic shock (Abstract 78).**

“The 30-day results of CULPRIT-SHOCK, published last year, demonstrated that the composite endpoint of death or severe renal failure leading to renal-replacement therapy was lower with PCI of the culprit lesion only than with immediate multivessel

PCI,<sup>2</sup>” says Dr. Thiele, noting that, “This led to a downgrading of immediate multivessel PCI in patients with cardiogenic shock in the 2018 ESC/European Association for Cardio-Thoracic Surgery (EACTS) Guidelines on Myocardial Revascularization.<sup>3</sup>”


**One year on, the benefit of culprit-lesion-only PCI over immediate multivessel PCI on the composite endpoint of all-cause mortality or renal replacement in these patients is maintained.**

A total of 684 patients were followed up for one year leading to a 99% complete follow-up. “The one-year composite endpoint was 52.0% with culprit-lesion-only PCI and 59.5% with multivessel PCI (relative risk 0.87; 95% confidence intervals [CI] 0.76-0.99; p=0.048),” says Dr. Thiele. “However,” he notes, “the 30-day statistically significant difference in all-cause mortality was attenuated at one year, which was 50% for culprit-lesion-only PCI and 56.9% with multivessel PCI (relative risk 0.88; 95% CI 0.76-1.01; p=0.07). A landmark analysis showed


no difference in mortality between the two approaches between 30 days and one year but a significant difference within the first 30 days.” Culprit-lesion-only PCI was associated with a higher risk of repeat revascularisation (relative risk 3.44; 95% CI 2.39-4.95; p<0.001) and rehospitalisation for congestive heart failure (relative risk 4.46; 95% CI 1.53-13.04; p=0.003).

In summarising, Dr. Thiele says, “The advantage of culprit-lesion-only PCI over multivessel PCI on all-cause mortality reduces with time but there is no increase in all-cause mortality between 30 days and one year. However, culprit-lesion-only PCI is possibly associated with a higher incidence of heart failure hospitalisations and more frequent repeat revascularisation at one year.” Overall, he suggests, “The one-year results of CULPRIT-SHOCK support the recent change in the 2018 ESC/EACTS Guidelines on Myocardial Revascularization.<sup>3</sup>”

1. Thiele H, et al. N Engl J Med 2018;August 25:doi:10.1056/NEJMoa1808788.  
2. Thiele H, et al. N Engl J Med 2017;377:2419-2432.  
3. Neumann F-J, et al. Eur Heart J 2018;August 25: <https://doi.org/10.1093/eurheartj/ehy394>.



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# Bayer at ESC Congress 2018



*Don't Miss Our Satellite Symposia-  
Experts on the Spot Sessions*

**10.15 – 10.45, The Hub – Haendel**  
**Anticoagulation in Challenging  
Circumstances: Translating the RWE Data  
for Your Multi-Morbid Patients with AF**

**16.00 – 16.30, The Hub – Brahms**  
**Setting the COMPASS into New Directions:  
who will Benefit in Coronary Artery Disease?**

## Sunday 26th August

### Satellite Symposium

**13.00 – 14.00**  
Baku – Village 5

**Rivaroxaban in Cardiovascular  
Protection: Getting to the Heart  
of the Matter**

Co-Chairs:  
Ajay Kakkar and John Camm

To learn more about our programme at  
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#ESCCongress

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## Safe and effective stroke prevention in atrial fibrillation: The 2018 EHRA Practical Guide on NOACs



**Dr.  
Jan Steffel**

**According to 2016 ESC Guidelines on atrial fibrillation (AF), non-vitamin K antagonist oral anticoagulants (NOACs) should be used in preference to vitamin K antagonists for the prevention of stroke in patients with AF, except in those with a mechanical heart valve or mitral valve stenosis.<sup>1</sup>**

“Use of NOACs is growing,” says Doctor Jan Steffel (University Heart Center Zurich, Zurich, Switzerland), first author on the European Heart Rhythm Association (EHRA) Practical Guide on the use of NOACs. “The EHRA guide gives doctors easy-to-follow, practical advice on using these agents in a variety of specific clinical situations. The third edition<sup>2</sup> was launched at EHRA’s annual congress in March this year and the impressive number of delegates the session attracted highlights the demand for this type of document.”

The 2018 edition of the guide features several new chapters covering the use of NOACs in particular patient groups, such as those with extremes of weight, athletes, frail individuals and those with cognitive impairment, and the correct dosing of NOACs in conditions other than AF, for example

ischaemic heart disease. Doctors can also find the latest advice on the combination of NOACs with antiplatelet drugs in patients with coronary artery disease, the administration of anticoagulants around cardioversion and the use of the recently approved, first NOAC reversal agent, idarucizumab. Finally, Dr. Steffel draws attention to the expansion of the chapter on drug-drug interactions to cover anticancer and antiepileptic drugs, which he calls “a first of its kind.”

**“The 2018 EHRA Practical Guide is an essential companion for all doctors using NOACs in patients with AF.”**

At ESC Congress 2018, delegates can access the 2018 EHRA Practical Guide in an abridged format - via the EHRA Key Messages Mobile app. Those wanting a more traditional format can buy a copy of the Key Messages from the ESC Shop at the ESC Plaza. EHRA Members get a discounted price.

1. Kirchhof P, et al. Eur Heart J 2016;37:2893-2962.
2. Steffel J, et al. Eur Heart J 2018;39:1330-1393.

### Don't miss!

‘The 2018 EHRA Practical Guide for the use of NOACs in patients with atrial fibrillation’  
*Monday, 08:00 - 08:30; Mirowski - Lecture room.*

## Under 40 or in training?

**NEW Combined Young Membership**



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Acute Cardiovascular  
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**EAPCI**  
European Association of  
Percutaneous Cardiovascular  
Interventions

**EHRA**  
European Heart  
Rhythm Association

**HFA**  
Heart Failure  
Association

### Satellite Symposium

# Treating angina: the way forward

Chairpersons:

**P. Camici**  
(Italy)

**C. Pepine**  
(USA)

Speakers:

**J.L. López-Sendón** (Spain)

**G. Rosano** (UK)

**Don't forget the Satellite Symposium  
Experts on the Spot**

Chairperson: **N. Danchin** (France)

Speakers: **Y. Chen** (China), **D. Franca** (Brazil)

What if angina recurs after coronary  
revascularization?

**16:00-16:30** Sunday, August 26, 2018  
Bach – The Hub

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