

Congress News

ESC Congress **Paris 2019**

Together with **World Congress of Cardiology**

Day 3

Monday 2 September

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Dapagliflozin reduces cardiovascular events in HFrEF, not just diabetes

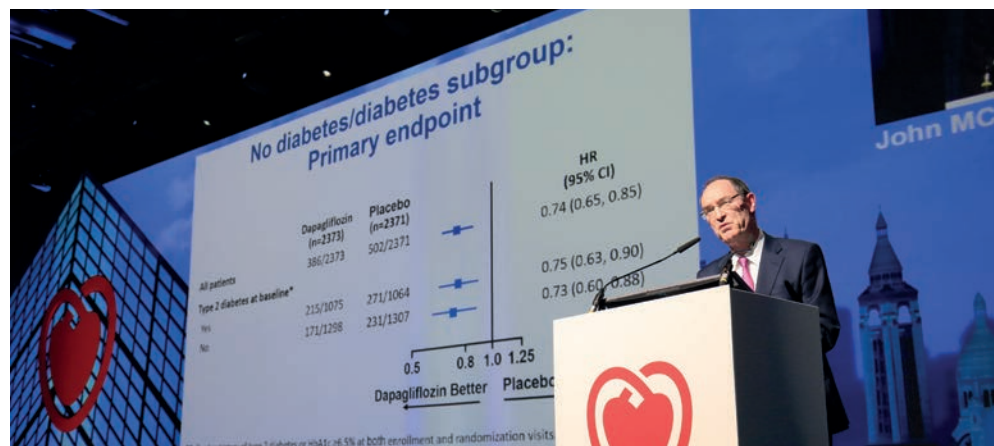
"Yesterday, we presented once-in-a-lifetime findings that sodium-glucose co-transporter-2 (SGLT2) inhibitors are truly a treatment for heart failure (HF) and not just diabetes," says Professor John McMurray (University of Glasgow, Glasgow, UK), speaking about his Hot Line presentation on the DAPA-HF trial.

"HF is a very common complication of type 2 diabetes, occurring more frequently than stroke and as frequently as myocardial infarction," explains Prof. McMurray. "Trials have shown that, in addition to effectively treating diabetes, SGLT2 inhibitors also reduce the risk of patients developing HF. And the benefits are seen fairly rapidly, within weeks of starting treatment. It follows naturally that the next question would be, 'Can these drugs be used to treat patients with established HF, including those without diabetes?' And this is what we wanted to look at in DAPA-HF."

The trial randomised 4,744 patients with HF with reduced ejection fraction (HFrEF) (left ventricular ejection fraction $\leq 40\%$) from 20 countries to dapagliflozin (10 mg once daily) or matching placebo, in addition to standard care, comprising an angiotensin-converting enzyme inhibitor, angiotensin receptor blocker or angiotensin receptor-neprilysin inhibitor (94%), beta-blocker (96%) and mineralocorticoid receptor antagonists (71%). The primary endpoint was a composite of the incidence of worsening HF or death from cardiovascular (CV) causes, analysed as a time-to-first event. The median follow-up was 18.2 months. Patients in DAPA-HF were similar to those included in HFrEF registries and other trials. Around half of the patients enrolled did not have a diagnosis of diabetes.

"We found that treatment with dapagliflozin led to a statistically significant reduction in the risk of the composite of worsening HF or CV death by 26% ($p < 0.00001$)," says Prof. McMurray.

When analysed separately, a first episode of worsening HF was reduced by 30% ($p = 0.00003$) and the risk of CV death was reduced by 18% ($p = 0.029$).



"Dapagliflozin also reduced the risk of death from any cause by 17% ($p = 0.022$) and it is quite unusual to see such a benefit in clinical trials," comments Prof. McMurray.

The safety profile of dapagliflozin was good. There were no notable imbalances in frequencies between the treatment arms, including for serious adverse events or adverse events of interest. Adverse events related to volume depletion occurred in 7.5% of patients receiving dapagliflozin and 6.8% receiving placebo. Corresponding rates of adverse events related to renal dysfunction were 6.5% and 7.2%, respectively. Major hypoglycaemia and lower limb amputation and fracture were infrequent and occurred at similar rates in the two arms. The tolerability of treatment was supported by very low rates of discontinuation of study drug.

Quality of life (QoL) is a major issue for patients with HF and Prof. McMurray highlights the benefit of dapagliflozin on

patients' well-being. "Patients with HF report worse QoL than individuals with any other chronic condition. In DAPA-HF, compared with placebo, treatment with dapagliflozin led to more patients having a clinically important improvement in health-related QoL (15% more likely to improve; $p < 0.001$) and fewer patients having an important deterioration in their health-related QoL (16% less likely to deteriorate; $p < 0.001$)."

Summing up the trial results, Prof. McMurray says, "The results from DAPA-HF are remarkable. And probably the most important finding of all is that dapagliflozin was associated with benefit in patients without diabetes. With dapagliflozin, we did the three things you want to do for the patient in the ideal world: make them feel better, keep them out of hospital and keep them alive. That is why we are so delighted with the results."

Don't miss!

• **Meet the Trialist - DAPA-HF**
Today, 08:00 - 08:30; Global Exchange 1

The Global Exchange Area

Broaden your professional development

Skills and knowledge required in cardiology today, including:

- > CVD research opportunities
- > Equity in cardiology
- > Innovative technologies - safety and ethical integrity
- > Advance your career with new skills
- > WHF Meet & Share Forum

On the ESC Plaza

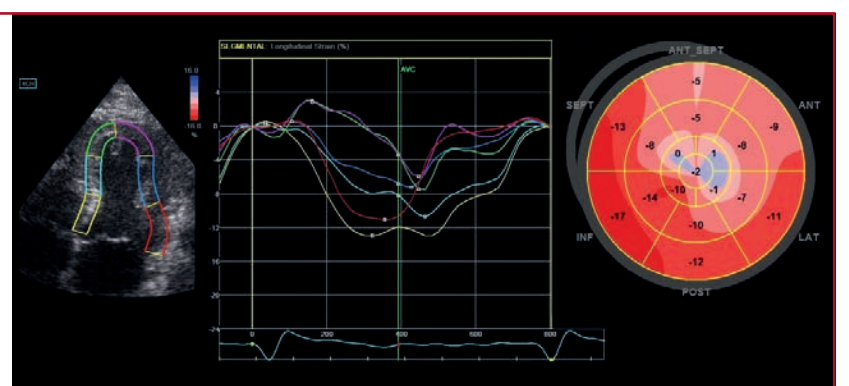
What's Your Diagnosis?

BROUGHT TO YOU BY THE EUROPEAN ASSOCIATION OF CARDIOVASCULAR IMAGING (EACVI)

2D speckle tracking echocardiography in a 62-year-old male with acute chest pain.

Lars Gunnar Kjaeoe and Thor Edvardsen, Oslo University Hospital, Oslo, Norway

EACVI
European Association of
Cardiovascular Imaging



Answer on page 3.

Ticagrelor reduces ischaemic events in patients with diabetes and prior coronary intervention: Results from THEMIS

ESC Congress 2019's Hot Line Sessions opened with a bang yesterday, with the potentially practice-changing results from the randomised phase III THEMIS trial, published simultaneously in the *New England Journal of Medicine*¹ and *The Lancet*.²

Professor Deepak L. Bhatt (Brigham and Women's Hospital and Harvard Medical School, Boston, Massachusetts, USA) describes the rationale for the study, which is the largest trial in type 2 diabetes to date. "Patients with both coronary artery disease (CAD) and type 2 diabetes mellitus are at very high risk of future cardiovascular (CV) events, such as myocardial infarction (MI) and stroke. In patients with acute coronary syndromes or prior MI, dual aspirin and ticagrelor therapy reduces the risk of recurrent events compared with aspirin alone. However, whether adding ticagrelor to standard-of-care aspirin results in similar benefits in patients with stable CAD and diabetes was not known. That is what THEMIS set out to investigate."

In this double-blind, placebo-controlled trial, 19,220 patients with diabetes and stable CAD (defined as a history of percutaneous coronary intervention [PCI], bypass grafting or angiographic stenosis of 50% or more in at least one coronary artery) from 1,315 sites across 42 countries were randomised to receive ticagrelor (60 mg bid for most of the trial) or placebo in addition to low-dose aspirin (75-150 mg). Patients with known prior MI or stroke were excluded. Patients were followed up for a median of around 40 months.



Adding ticagrelor to aspirin significantly reduced the study's primary efficacy endpoint of CV death, MI or stroke by 10% compared with placebo, with rates of 7.7% vs 8.5% (hazard ratio [HR] 0.90; p=0.038).

As presented by Professor Ph. Gabriel Steg (Hospital Bichat, Paris, France), it was the 58% of patients in THEMIS who had undergone previous PCI, the prespecified 'THEMIS-PCI' analysis, who appeared to benefit most. Dual antiplatelet therapy had no apparent effect in patients without a history of PCI.

Among the 11,154 patients in THEMIS-PCI, an intention-to-treat (ITT) analysis showed that

adding ticagrelor to aspirin reduced the risk of the primary endpoint by 15% compared with aspirin—with rates of 7.3% and 8.6%, respectively (HR 0.85; p=0.013). The effects were apparent even when PCI was performed up to 10 years earlier. Of note, consistent benefits were observed across the ischaemic endpoints, including MI, ischaemic stroke, and acute limb ischaemia and amputation.

When the results of THEMIS PCI were analysed while patients were receiving treatment—rather than by ITT—all-cause mortality was significantly lower in patients receiving dual antiplatelet therapy. Prof. Bhatt cautions, "These findings should be interpreted with care because on-treatment analyses exclude patients who may have stopped treatment for a variety of reasons,

including bleeding. However, they do show the potential survival advantages of this approach in patients who are tolerating and adherent to the treatment."

The primary safety endpoint of THEMIS was Thrombolysis in Myocardial Infarction (TIMI) major bleeding and in the study overall, the incidence was significantly higher with ticagrelor vs placebo (2.2% vs 1.0%; HR 2.32; p<0.001). However, when a composite of efficacy events and fatal or intracranial bleeding was evaluated, the net clinical benefit was favourable in THEMIS-PCI whereas it did not appear to be in patients without previous PCI (15% relative risk reduction vs 6% relative risk increase, interaction p=0.012).

Prof. Bhatt concludes, "The THEMIS analyses demonstrate for the first time that prolonged dual antiplatelet therapy with ticagrelor and low-dose aspirin has significant outcome benefits for patients with stable CAD and diabetes who have previously undergone PCI. It seems reasonable to consider this approach for patients at a low bleeding risk or those who have already tolerated this type of treatment for a period of several months, without having an episode of bleeding."

1. Steg PG, et al. *N Engl J Med* 2019. doi/10.1056/NEJMoa1908077
2. Bhatt DL, et al. *Lancet* 2019. doi/10.1016/S0140-6736(19)31887-2

Replay the video and slides on ESC 365: www.escardio.org/365

2019 ESC Clinical Practice Guidelines on chronic coronary syndromes



Prof. Franz-Josef Neumann



Prof. Udo Sechtem

"The first, and most obvious, thing to notice about the 2019 ESC Guidelines for the diagnosis and management of chronic coronary syndromes¹ is the new terminology," says Guideline Review Coordinator, Professor Franz-Josef Neumann (University Heart Center Freiburg-Bad Krozingen, Bad Krozingen, Germany).

No longer referred to as 'stable coronary artery disease' (CAD), the term 'chronic coronary syndromes' (CCS) is designed to convey the dynamic continuum of CAD. The disease is characterised by phases of stability—CCS—interrupted by phases of instability—acute coronary syndromes—due to processes such as atherosclerotic plaque rupture or erosion and thrombosis-related events.

The new ESC Guidelines feature extensive revision of the pretest probability (PTP) of disease to try to give a more realistic

assessment of the patient's likelihood of having CAD. "Evidence emerging since the 2013 ESC Guidelines made it clear that the model used in that version was overestimating the prevalence of disease, particularly in females, and many patients were assessed as being in worse health than they actually were," explains Guideline Review Coordinator, Professor Udo Sechtem (Robert Bosch Hospital, Stuttgart, Germany). The new model is still based on age, sex and the nature of symptoms, but it now also includes dyspnoea as a main presenting symptom. The 2019 ESC Guidelines suggest that it is safe to defer routine testing in patients with a PTP <15%, although it can still be considered in these patients if symptoms are limiting or require clarification. "By reducing the need for invasive and non-invasive tests for patients with suspected CAD, the revised PTP model should spare patients unnecessary procedures and should also lower costs," says Prof. Sechtem.

The presence of factors that increase the likelihood of obstructive CAD—such as cardiovascular disease risk factors—or those that decrease the likelihood of CAD—such as normal exercise electrocardiogram (ECG)—can improve PTP assessment and should also be considered, particularly in patients with PTP 5-15%. This provides the 2019 ESC Guidelines' novel element of clinical likelihood of CAD. "The new guidelines are a little more liberal when it comes to determining which diagnostic pathway to use," Prof. Sechtem

comments. "Instead of being provided with a prescriptive algorithm, doctors are now given the opportunity to build a clinical estimate of risk into the diagnosis. This gives clinicians more freedom to tailor diagnosis to the individual patients, although this flexibility of approach may not appeal to all practitioners."

The new guidelines give greater prominence to coronary computed tomography angiography (CTA) to confirm CAD.

Prof. Neumann explains. "If obstructive CAD cannot be ruled out with sufficient certainty using clinical assessment, non-invasive functional imaging or coronary CTA are equally recommended as alternative initial approaches. If, following coronary CTA, evidence of obstructive CAD is inconclusive, functional imaging is recommended." The choice of initial test should be based on the clinical likelihood of CAD along with test availability and local expertise. "This will probably lead to a more liberal use of coronary CTA to exclude CAD in patients with a low PTP," comments Prof. Sechtem.

The role of coronary CTA has been elevated while the use of exercise ECG without imaging to rule in or rule out CAD has been downgraded. "The class of recommendation for exercise ECG has been moved from I ('recommended') to IIb ('may be considered') and it should only be used when there is no possibility to perform functional imaging," says

Prof. Neumann. Exercise ECG does, however, still have value as what Prof. Neumann calls "a niche indication" and can be used to assess functional capacity, blood pressure and heart rate, dependent on exercise.

As far as antithrombotic treatment is concerned, a new addition to the 2019 ESC Guidelines is the recommendation that dual antithrombotic treatment for long-term prevention should be considered for patients with CCS and sinus rhythm. "Addition to aspirin of another agent should be considered for patients with a high risk of ischaemic events and a low risk of bleeding events and may be considered for patients with a moderately elevated ischaemic risk and no high risk of bleeding," explains Prof. Neumann. Clopidogrel, prasugrel, rivaroxaban and ticagrelor are each possible combination partners for aspirin in dual antithrombotic therapy.

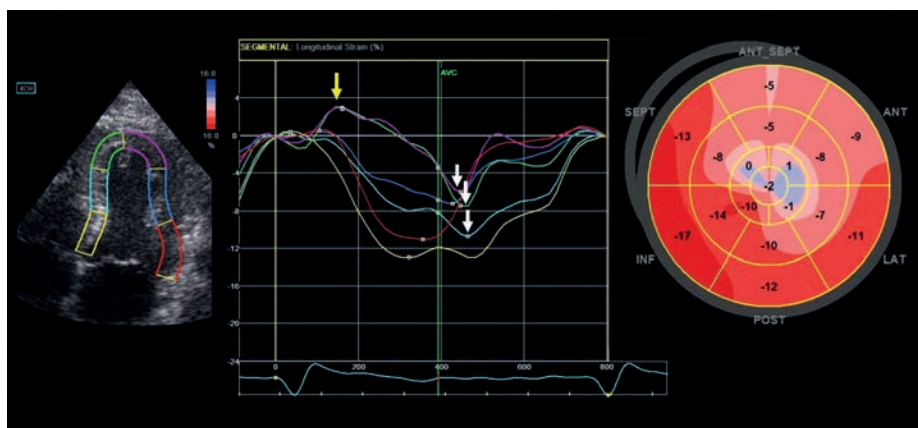
Prof. Neumann concludes, "CCS covers a range of symptomatic and asymptomatic individuals with different risks for future cardiovascular events that can change over time. The new guidelines should help to more easily and precisely identify those at a greater risk of events and stratify treatment accordingly."

1. 2019 ESC Guidelines for the diagnosis and management of chronic coronary syndromes. *Eur Heart J* 2019. doi/10.1093/eurheartj/ehz425

Replay the video and slides on ESC 365: www.escardio.org/365

What's Your Diagnosis?

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Solution: Acute myocardial infarction

Acute myocardial infarction due to occlusion of the left anterior descending (LAD) coronary artery. 2D speckle tracking echocardiography shows typical ischaemic longitudinal strain features in adjacent septal and apical segments, including early systolic lengthening of apical-septal (green curve) and apical-lateral (purple curve) segments denoted by the yellow arrow and post-systolic shortening in mid-septal (light blue curve), apical-septal (green curve) and apical-lateral (purple curve) segments denoted by white arrows. The bull's eye plot shows abnormal longitudinal strain corresponding to the LAD perfusion territory.

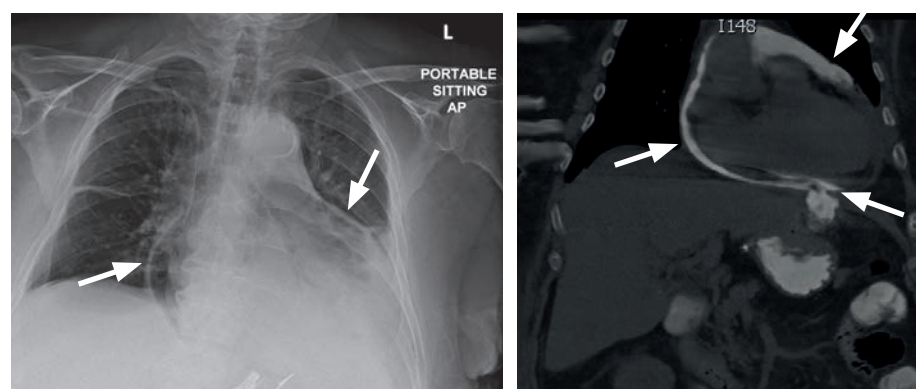
Lars Gunnar Klæboe and Thor Edvardsen, Oslo University Hospital, Oslo, Norway



Case Corner

A 77-year-old patient presented with fever and chest pain radiating to the left arm exacerbated by breathing and hypotension. Chest radiograph displayed pneumopericardium (arrows, left panel). Infused CT chest and abdomen with oral contrast showed a communication between the stomach and pericardium (arrows, right panel).

Submitted by Doctor Joel Scott-Herridge (University of Manitoba, Winnipeg, Canada) (FP# 4219)



Want to know more about gastropericardial fistula?

Join the Clinical Case session entitled 'A bag of trouble: lessons in myocardial and pericardial disease' by the Cardiologists of Tomorrow:

Today, 16:40 - 17:50; Hugo - The Hub

And there are more interesting cases at Case Corner 1 and 2 in the Poster Area!



UNIVERSITY OF GOTHENBURG

This program is accredited by the European Board for Accreditation in Cardiology (EBAC) for 1 hour of external CME credit. Each participant should claim only those hours of credit that have been spent in the educational activity.

Organized by: the Sahlgrenska Academy, University of Gothenburg, Sweden
Course Director: Professor Karl Swedberg



EBAC ACCREDITED SATELLITE SYMPOSIUM HELD DURING ESC CONGRESS 2019

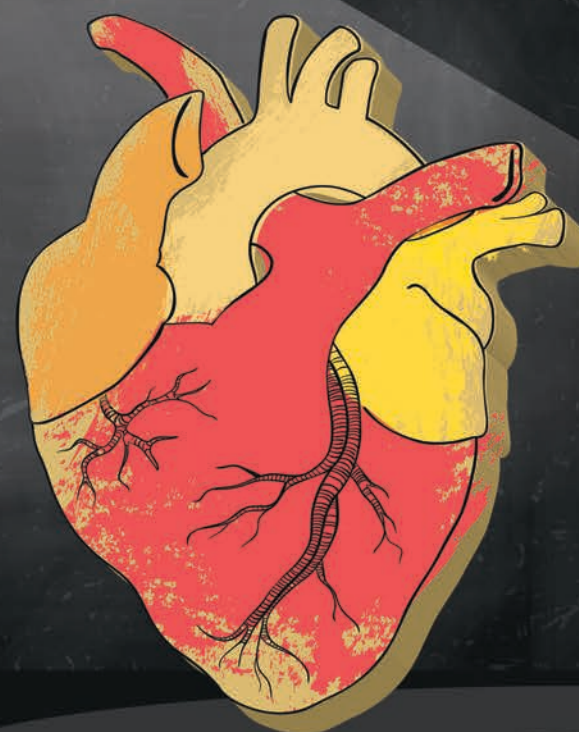
SPOTLIGHT ON THE EFFECTS OF SGLT2 INHIBITION IN HEART FAILURE

Monday, 2nd September 2019, 13:00–14:00, Centre Stage

Lunch will be provided

Agenda

Time	Session
13:00–13:10	The hidden burden of heart failure Frank Ruschitzka, Chair (Switzerland)
13:10–13:25	The clinical impact of SGLT2 inhibitor cardiovascular outcomes trials Marc Bonaca (USA)
13:25–13:40	SGLT2 inhibitors: Unveiling the mechanisms of cardiovascular risk reduction Subodh Verma (Canada)
13:40–13:55	Lighting the way to the future of heart failure management Mikhail Kosiborod (USA)
13:55–14:00	Q&A All faculty



Supported by an unrestricted educational grant from AstraZeneca

In compliance with EBAC guidelines, all speakers/chairpersons participating in this program have disclosed or indicated potential conflicts of interest which might cause a bias in the presentations. The Organizing Committee/Course Director is responsible for ensuring that all potential conflicts of interest relevant to the event are declared to the audience prior to the CME activities.



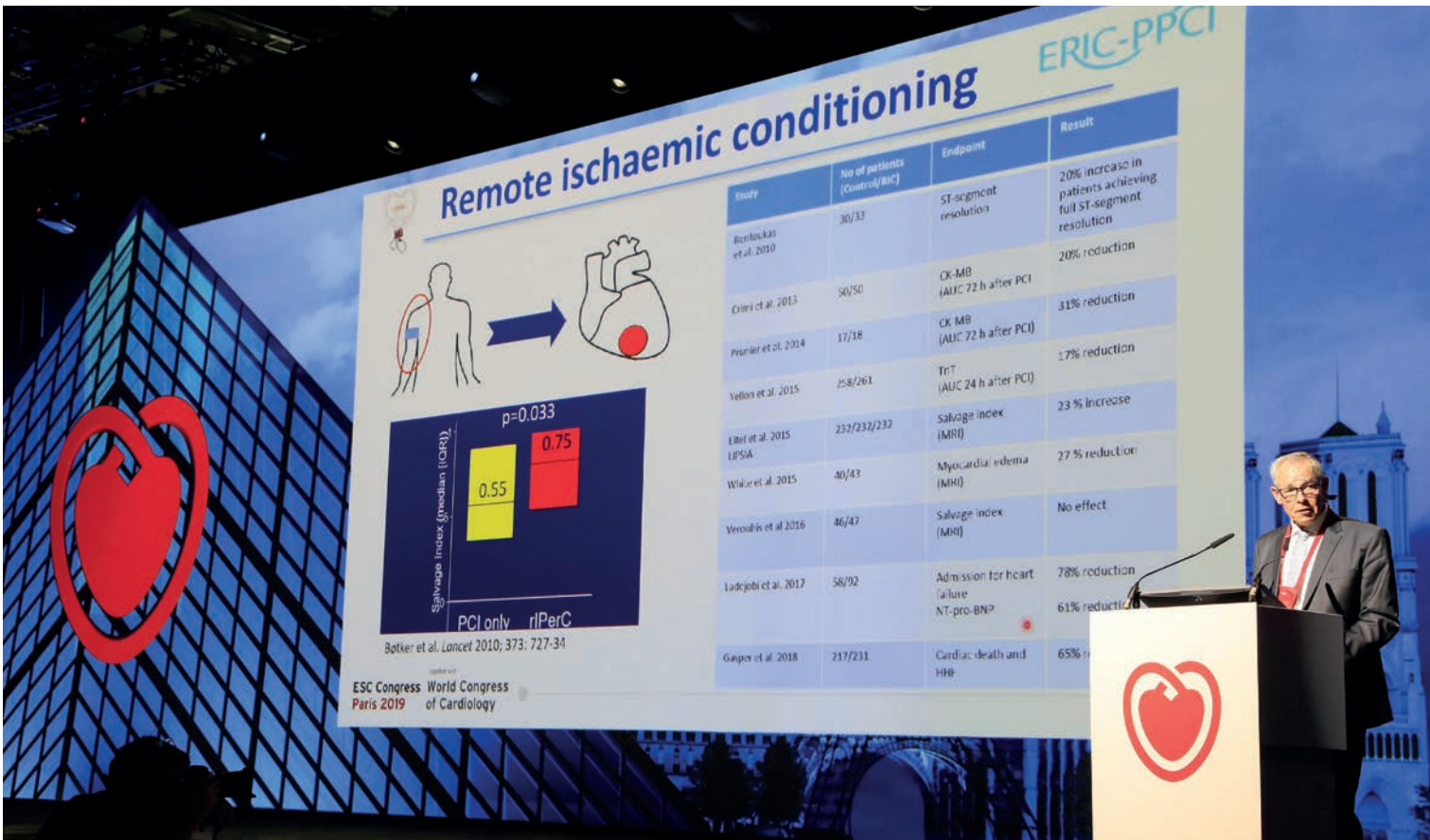
Remote ischaemic conditioning for MI: The definitive answer

Simple, cheap and easy to perform, remote ischaemic conditioning (RIC) appeared a very appealing way to improve outcomes in patients with myocardial infarction (MI).

However, in a Hot Line presentation yesterday, Professor Hans Erik Bøtker (Aarhus University Hospital, Aarhus, Denmark) reported neutral results from the large, randomised CONDI-2/ERIC-PPCI trial—an international multicentre study led by Prof. Bøtker and Professor Derek Hausenloy (Hatter Institute, University College London, London, UK) as Co-Principal Investigators.

“Although there have been tremendous improvements in outcomes for patients with MI, mortality reduction seems to have plateaued and post-MI heart failure has not decreased to the extent that we have expected in ST-segment elevation MI (STEMI),” says Prof. Bøtker. “Primary percutaneous coronary intervention (PPCI) has radically increased the chances of short-term recovery but we now need to find ways to reduce reperfusion damage and subsequent hospitalisations for heart failure. Inducing temporary ischaemia in tissue remote from the heart with RIC may stimulate activation of an endogenous pathway to protect against reperfusion damage. Indeed, in proof-of-concept investigations, we found that RIC improved myocardial salvage and reduced myocardial infarct size.”

Prof. Bøtker continues, “With the CONDI-2/ERIC-PPCI trial, we wanted to see the effect of reducing infarct size on patient outcomes.” Over 5,000 patients with STEMI at centres across Denmark, UK, Spain and Serbia were randomised to receive standard treatment or RIC prior to PPCI. RIC was



achieved in the arm using an automated cuff device programmed to deliver four cycles of 5-minute inflation (to 200 mmHg) and 5-minute deflation prior to PPCI. The primary endpoint was combined cardiac death and hospitalisation for heart failure at 12 months. Secondary endpoints included the individual components of the primary endpoint and major adverse cardiovascular and cerebral events.

RIC had no effect on the primary endpoint or on any of the secondary endpoints.

“We also found no effect of RIC on the use of implantable cardioverter defibrillators within 12 months or on troponin release in a subgroup of 2,600 patients,” says Prof. Bøtker. “Finally, we had expected that patients with the largest infarcts would benefit the most from RIC, which was what we had seen in our proof-of-concept study, but that did not turn out to be the case in the outcomes trial.”

Speculating about why RIC did not work, Prof. Bøtker suggests it may be because the efficacy of modern revascularisation therapy outweighs potential improvements with RIC because infarct size is low. “Although

we did not identify a specific interaction, novel antiplatelet therapies may have an inherent cardioprotective effect that was not seen with therapies used at the time of the proof-of-concept studies,” he also notes. “This was a robustly designed, sufficiently powered trial and so our conclusion has to be that RIC does not improve clinical cardiac outcomes at 12 months in ischaemic patients undergoing PPCI.”

1. Bøtker HE, et al. Lancet 2010;375:727-734.

Replay the video and slides on ESC 365: www.escardio.org/365

The growing problem of adult congenital heart disease



Prof. Jolien Roos-Hesselink

Thanks to advances in technology and treatment, adults with congenital heart disease now outnumber children with these conditions. According to Professor Jolien Roos-Hesselink (Erasmus MC, Rotterdam, Netherlands), Chair of this morning's joint session with the International Society for Adult Congenital Heart Disease, the number of children with congenital heart disease reaching adulthood has risen from 10% in the 1960s to around 90% in the 2000s.

“In my clinic in 1992, we had 600 patients with adult congenital heart disease; last year we had 4,000 patients,” she says.

“The number of adults with congenital heart disease is growing rapidly and patients have specific management needs.”

“Today, we are able to treat not just simple congenital heart conditions, but also more complex forms of disease, such as hypoplastic left heart syndrome,” says Prof. Roos-Hesselink. “This means that many of our survivors have had a number of major surgeries, often before they become teenagers. Adults living with congenital heart conditions usually have residual problems that can interfere with their ability to lead normal lives, such as

taking part in sports, having a career or becoming pregnant, and many will require reinterventions.”

On the positive side, due the increase in survivor numbers, this therapeutic area has become more widely recognised and care of patients has become more structured. On the negative side, there is much less information from trials on adult congenital heart disease—and trials are generally smaller—than in other areas of cardiovascular medicine and this hinders effective management. This morning's session aims to try to address this. “The session features expert presentations of evidence for treatment in four clinical scenarios—namely atrial septal defects closure, coronary anomalies, dilated ascending aorta and different anticoagulation strategies—and it is hoped that delegates will be able to draw on this to inform management decisions,” Prof. Roos-

Hesselink explains. “Moving forward, we need to increase our evidence base through collaboration,” she says. Potential future strategies to improve management for adult congenital heart disease include developing a European Reference Network for data collection and sharing.

Prof. Roos-Hesselink hopes that by sharing information better treatment approaches will be developed and that these will improve the outlook for patients. “Many of these survivors are young adults and we want to be able to give them a normal life expectancy with as good a quality of life as possible.”

Don't miss today!

- **Give me the evidence in adult congenital heart disease!**
11:00 - 12:30; Tbilisi - Village 6
- **Grown-up Congenital Heart Diseases**
08:30 - 10:00; Case Corner 2 - Poster Area

Prasugrel superior to ticagrelor in ACS

Results from the ISAR-REACT 5 trial have been causing much discussion since they were presented at yesterday's Hot Line Session and simultaneously published in the *New England Journal of Medicine*.¹

According to current clinical practice guidelines, prasugrel and ticagrelor have equal, Class I recommendations for use following percutaneous coronary intervention (PCI) in acute coronary syndromes (ACS), with and without ST-segment elevation. But, as presenter Professor Stefanie Schüpke (Deutsches Herzzentrum München, Munich, Germany), explains, "It was not clear to us what the relative merits of the two different treatments were. In the emergency room, we found ourselves faced with the dilemma of which of the two drugs we should use." The group embarked on a head-to-head comparison of the two agents in a randomised setting in an investigator-initiated study funded by the DZHK (German Centre for Cardiovascular Research) and the Deutsches Herzzentrum München.

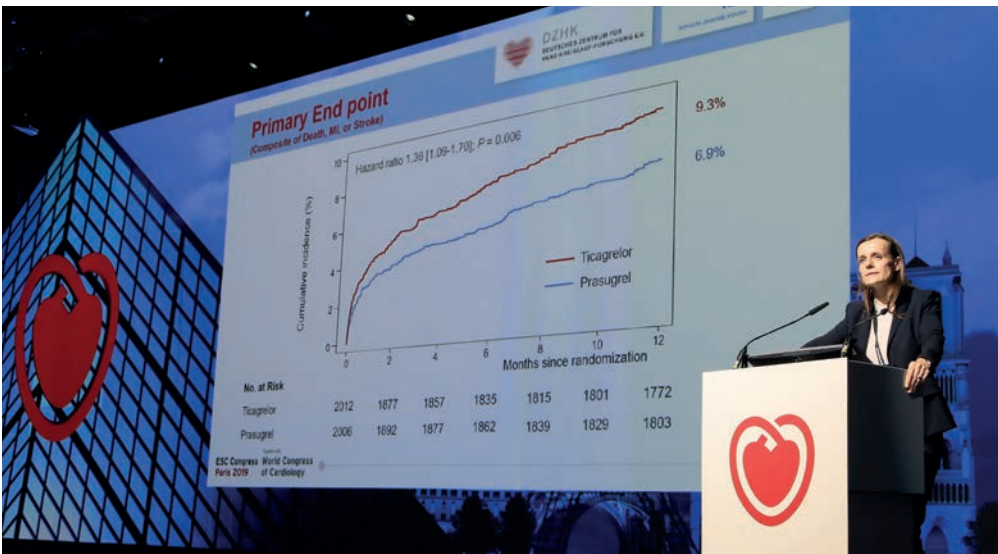
This was an open-label multicentre trial, enrolling patients admitted for ACS and planned invasive strategy from 23 centres in Germany and Italy. Patients randomised to ticagrelor received a loading dose as soon as possible after randomisation and before coronary angiography. With prasugrel, study drug initiation depended on clinical presentation: it was administered as soon

as possible after randomisation for patients with ST-elevation myocardial infarction (STEMI) but after the coronary anatomy was known (and before PCI) in patients with non-ST-elevation (NSTEMI)-ACS.

The primary endpoint was a composite of death, myocardial infarction (MI) or stroke within 12 months after randomisation. Secondary endpoints included the individual components of the composite, type 3-5 bleeding (according to the hierarchical Bleeding Academic Research Consortium classification [BARC]) and stent thrombosis. Hazard ratios (HRs) represent the comparison of ticagrelor in relation to prasugrel.

The composite of death, MI or stroke at 12 months was higher with ticagrelor compared with prasugrel (9.3% vs 6.9%; HR 1.36; 95% confidence interval [CI] 1.09-1.70; p=0.006).

The difference in the effects of the two treatments on the primary endpoint was primarily driven by rates of MI, which were 4.8% with ticagrelor and 3.0% with prasugrel (HR 1.63; 95% CI 1.18-2.25). There were no significant differences between ticagrelor and prasugrel in rates of overall mortality (4.5% and 3.7%, respectively) and stroke (1.1% and 1.0%, respectively). Rates of definite or probable stent thrombosis were 1.3% and 1.0% while rates of definite stent thrombosis were 1.1% and 0.6%, with ticagrelor and prasugrel, respectively.



"The benefit of prasugrel over ticagrelor did not come at the expense of an increased bleeding risk," says Prof. Schüpke. There was no difference between treatments in BARC type 3-5 bleeding, with rates of 5.4% with ticagrelor and 4.8% with prasugrel (HR 1.12; 95% CI 0.83-1.51; p=0.46).

"The results very clearly demonstrate the superiority of prasugrel over ticagrelor," says Prof. Schüpke. "This actually came as a surprise to us. When we planned the trial, we assumed that ticagrelor would be superior to prasugrel, but results show us that the opposite is true. At the moment, we do not yet know why prasugrel is superior to ticagrelor. Possibilities include issues related to the reversibility of platelet inhibition, treatment half-lives, drug-drug interactions and side effects leading to higher rates of discontinuation with ticagrelor, but this needs more investigation. We have performed substudies on platelet function that may help to provide some of the answers."

Prof. Schüpke thinks that the results of the trial will have an impact on clinical practice.

"Because prasugrel and ticagrelor have equal recommendation in the guidelines, some hospitals had opted to prescribe just one of the two drugs. In the light of the strong evidence from our trial that prasugrel is superior to ticagrelor, clinicians and hospitals may reconsider their treatment choices." Further, she adds, "The ISAR-REACT 5 trial not only tested two drugs, but also two strategies, i.e. pretreatment vs no pretreatment in NSTEMI-ACS. The question of whether patients with ACS need pre-treatment with P2Y12 antagonists before reaching the cath lab has not been fully elucidated to date. Its clarification is particularly important for patients with NSTEMI-ACS, where the interval between presentation and invasive evaluation is usually longer than for STEMI patients. The results of the ISAR-REACT 5 trial support a prasugrel-based strategy that does not include pre-treatment in NSTEMI-ACS patients."

1. Schüpke S et al. N Engl J Med 2019. doi.org/10.1056/NEJMoa1908973

Don't miss!

- **Meet the Trialist - ISAR-REACT 5**
Today, 13:45 - 14:15; ESC TV Stage - ESC Plaza

Abstract of the day:

15 years of TAVI: Reduction in complications but not valve function

A study today will report that since the first human percutaneous insertion of a heart valve by Professor Alain Cribier in 2002,¹ there has been a major reduction in complications associated with transcatheter aortic valve implantation (TAVI) and the implanted valves show no deterioration over 10 years of use (Abstract 4069).

"Since 2002, there has been an improvement in the structure of the prosthetic implants and the number of procedures carried out continues to grow rapidly," explains first author, Doctor Guillaume Avinée (Rouen University Hospital, Rouen, France). "However, there are few reports available on long-term patient outcome and valve durability."

The study involved 1,530 patients with aortic stenosis receiving TAVI at Rouen University Hospital between 2002 and 2018. Transfemoral implantation (93%) with a balloon-expandable prosthesis (around 84%) was the most common approach. There was a significant reduction in vascular complications and stroke at one month to <1.0% in both cases over time. Of note, 30-day mortality fell to below 3% from 2015, reaching 2% in 2018.

"The duration of hospital stay has also decreased," says Dr. Avinée. "The median duration was just two days in 2018, with 80% of patients being discharged within three days of the procedure." Commenting on valve durability, a member of the original 2002 implant team and senior author of this abstract, Professor Hélène Eltchaninoff (Rouen University Hospital, Rouen, France), says, "Valves remained haemodynamically stable and only five patients showed severe valve deterioration: four went on to undergo successful valve-in-valve replacement. In some patients treated for over 10 years, the valve continues to perform well, without warning signs of wear."

The age at which patients undergo a procedure has remained relatively stable at around 84 years. "While we expect to see expansion of the procedure around this age, until there are more long-term data on valve durability, we do not think that it is generally suitable for patients below the age of 70 years," says Prof. Eltchaninoff. Of course, co-morbidities and risks of surgery need to be taken into account.

1. Cribier A, et al. Circulation 2002;106:3006-3008.

Don't miss!

- **15 years of TAVI: Increasing evidence for routine use**
Today, 14:30 - 15:40; Zagreb - Village 6

Twitter gives you more!



Professor C. Michael Gibson
(@CMichaelGibson; Harvard Medical School, Boston, MA, USA)
ESC Social Media Ambassador

"In terms of late-breaking trials and science that may change clinical practice, #ESCCongress 2019 rises to the very top of the list! It's a spectacular meeting!"

Join the #ESCBreakfastBuzz with Prof. Gibson—tweet him your comments and questions using #ESCBreakfastBuzz then follow the chat live at a Q&A today and tomorrow (08:00 - 08.20) on @escardio.

Don't miss!

- **Career development: Be a Twitter Pro**
Today, 12:00 - 12:30 and 16:00 - 16:30;
Professional Members' Lounge - ESC Plaza
- **Be scientific and unique on Twitter**
Tuesday, 13:00 - 14:00; Global Exchange 1 - ESC Plaza



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Incidence and mortality from ACS in Germany lowest for 10 years

The incidence and mortality due to acute coronary syndrome (ACS) among the German population has fallen over the decade since 2005, according to a Late-Breaking Science study reported yesterday by Doctor Johannes Neumann (University Heart Center Hamburg, Hamburg, Germany) (Abstract 1396).

The study involved every hospital in Germany and included all 3,797,546 cases of ACS reported throughout the country between 2005 and 2015. Dr. Neumann explains, “Over recent decades, the management of patients with ACS has changed substantially. Today, we have better primary and secondary prevention strategies, as well as interventional techniques, compared with 2005. It is important to know what effects these improved approaches have had on preventing and treating acute events.”

Between 2005 and 2015, incidence rates (per 1,000 person-years) fell for ACS (from 6.9 to 5.0 cases), ST-elevation myocardial infarction (STEMI) (from 2.0 to 1.0 cases) and

unstable angina pectoris (from 2.7 to 1.5), although they increased for non-STEMI (from 1.8 to 2.5).

Over the whole period, around two-thirds of patients (62%) underwent coronary angiography and 42% received percutaneous coronary intervention (PCI). Between 2005 and 2015, the proportion of these procedures increased, by 35% for coronary angiography (representing an increase from 52% to 70%) and by 47% (an increase from 34% to 50%) for PCI.

Throughout the 10-year period, the in-hospital mortality was 6.3%, being highest for patients with STEMI (12%) and lowest for patients with unstable angina pectoris (0.6%).

Between 2005 and 2015, in-hospital mortality decreased from 64.4 to 59.3 cases per 1,000 person-years.

“The data suggest that improvements in diagnosis and secondary prevention have led to fewer people presenting with ACS,” says Dr. Neumann. “The reduction in in-hospital deaths we saw during this 10-year

period is probably linked to the substantial increase in imaging and interventions we observed over the same time.” How do these data compare with the rest of Europe? “We are not aware of any similar data from other countries at this time,” he says, “but we would expect to see the same sort of trend. However, the results will depend on management approaches in each country. We know that in Germany, the use of coronary interventions is high, but this will differ between countries.”

It is not all good news, however, particularly for the 36% of patients who were women. “We saw substantial differences in treatment and outcomes between men and women, with fewer women receiving coronary angiography and PCI and a greater proportion dying in hospital,” says Dr. Neumann. “The fact that women were older when they received their first diagnosis may go some way to explaining these differences. It may also be because they more often present with atypical symptoms, which may lead to a delay in diagnosis and treatment. Further studies are warranted to understand sex differences and how imbalances can be addressed.”



Replay the video and slides on ESC 365: www.escardio.org/365

A HiSTORIC moment for cardiac troponin

Serial high-sensitivity cardiac troponin (hs-cTn) testing is used worldwide to aid in the diagnosis of myocardial infarction (MI). In a Hot Line presentation yesterday, the HiSTORIC study provided the first randomised controlled trial evidence that a single hs-cTn test can be used to safely and effectively rule out MI at presentation.

According to presenter, Professor Nicholas Mills (University of Edinburgh, Edinburgh, UK), “hs-cTn assays have advanced such that we can now measure very low levels of troponin, well below the 99th centile recommended by clinical practice guidelines to rule in MI. This information could enable doctors to identify low-risk patients on presentation to the emergency room (ER) and avoid hospital admission for serial testing.”

Clinical practice has not kept pace with this change in technology and most guidelines continue to recommend serial testing to rule out MI at the 99th centile diagnostic threshold. “We thought it would be safer to rule out MI using a much lower threshold, and this could reduce the need for serial testing and hospital admission,” says Prof. Mills. Data from observational studies give support to this concept, but randomised data have been lacking.

The British Heart Foundation-supported HiSTORIC trial was a stepped-wedge cluster randomised controlled trial in seven hospitals across Scotland. The design involved randomisation at the level of the hospital, not the patient, and therefore all consecutive patients undergoing hs-cTn testing for suspected acute coronary

syndrome in the ER were enrolled. MI was ruled out if hs-cTnI concentrations were <5 ng/L at presentation or between 5 ng/L and the 99th centile with a change <3 ng/L at three hours (High-STEACS pathway). “The study design meant that the pathway was applied to all-comers, not selected patients, and it enabled us to see how effective the approach was when adopted by hundreds of different clinicians across multiple hospitals,” explains Prof. Mills.

The co-primary endpoints were length of stay (efficacy) and MI or cardiac death after discharge (safety). A total of 31,492 patients with cTnI concentrations <99th centile were enrolled and followed up for one year. Because the trial used a comprehensive repository of routinely collected healthcare data (DataLoch™), there was no loss to follow-up.

Use of the pathway reduced length of stay by more than 3 hours (from 10.1 ± 4.1 to 6.8 ± 4.1 hours; p<0.001) and increased the proportion of patients discharged from the ER (from 53% to 74%; p<0.001).

The event rate for the safety outcome measure was similar before and after implementation of the early rule-out pathway, at 0.4% and 0.3% at 30 days, and 2.7% and 1.8% at one year, respectively. Prof. Mills comments, “The results show that not only is this approach safe for patients, but that it is likely to lead to substantial savings for healthcare



systems.” Work is ongoing to demonstrate the generalisability of this pathway across the different hs-cTn assays available.

One of the most notable findings from the trial for Prof. Mills was the rate of adherence to the pathway, which was between 86% and 92% for three prespecified adherence measures. “That is absolutely remarkable,” he says. “Usually, when you change care pathways, some clinicians are reluctant and continue their usual practice. The high adherence to the pathway is one of the main reasons that implementation was so successful. And we think that the adherence rate is testament to the pathway being simple, pragmatic and easy for clinicians to adopt.” Hints from qualitative research conducted by the group suggest that patients are also in favour of this approach. “With a standard-care pathway, patients frequently see different doctors at different times and are often left confused about the

information they receive. Our pathway involves a single healthcare provider who is responsible for the decision-making and patients feel more confident about the advice they are given.”

Prof. Mills is quite clear about what the results mean for clinical practice. “We’ve learned how to use hs-cTnI assays to their best effect. We should now move away from a single threshold to evaluate patients with suspected acute coronary syndrome, and this is likely to be increasingly reflected in clinical practice guidelines. All the trial sites have continued to use this approach to identify low-risk patients and we anticipate that these types of pathways will see widespread international adoption.” The scientific basis for the early rule-out pathway adopted in the HiSTORIC trial is published simultaneously in *Circulation*.¹

1. Bularga A, et al. *Circulation* 2019. doi.org/10.1161/CIRCULATIONAHA.119.042866

ESC Atlas keeps on giving!

Expanding beyond general cardiology to analyse healthcare gaps in different subspecialties of cardiovascular medicine

The ESC Atlas of Cardiology is a unique compendium of data of over 300 variables relating to the prevalence of cardiovascular disease (CVD), risk factors, outcomes, health infrastructure and service provision across ESC member countries. Already a highly valuable asset, what more can ESC Atlas provide?



Prof. Panos Vardas

Professor Panos Vardas (Hygeia Hospitals Group, Athens, Greece), ESC President 2012-2014 and Chief Strategy Officer of the ESC's European Heart Agency, explains, "Since the first data collection in 2017, ESC Atlas has been highlighting inequalities and healthcare gaps across Europe in human and capital resources related to CVD.¹ No other data compilation of this kind is available for CVD and it is the result of a huge collaborative effort with the National Cardiac Societies.

With a biennial update, we are now ready to present the CVD statistics from ESC Atlas for 2019. These data are expected to be published in the *European Heart Journal* by the end of the year. One of the main points to come out of the 2017 and 2019 analyses is that accessibility to modern-day advances is restricted in many countries, particularly those with low incomes, where it is difficult to upgrade diagnostic and therapeutic strategies to the high standard recommended in ESC Clinical Practice Guidelines. This is why ESC Atlas exists; to provide robust evidence to support the ESC's efforts to identify where cardiovascular healthcare can be improved and subsequently to shape cardiovascular policy. There is only so much cardiologists can do—the ESC Atlas database empowers the ESC and National Cardiac Societies to influence key decision makers for more favourable allocation of funds for prevention, treatment, education and research in CVD. Thus, having come so far with ESC Atlas, and seen the valuable insights it provides, we also wanted to expand the concept further in different subspecialties."



Prof. Petar M. Seferović

HFA Atlas was initiated in 2016 when around 40 key heart failure-specific variables were initially identified relating to epidemiology (e.g. the incidence of heart failure), outcomes (e.g. hospital deaths due to heart failure), healthcare resources (e.g. the number of dedicated heart failure units per country), drug reimbursement, and also the organisation and major activities of the National Heart Failure Societies (NHFS). Heart Failure Association (HFA) President, Professor Petar M. Seferović says, "Through

excellent interactions between ESC Atlas, HFA and the NHFS, we were able to collect data from 42 ESC countries. The first results were presented at Heart Failure 2019.² Using the enthusiasm and expertise of heart failure specialists, we were able to gain insight into the care given in various countries and the level of implementation of ESC Guidelines. We uncovered a wide variation in many of the parameters assessed and we are looking closely at the data—further analysis now and over time will help us to see the bigger picture where resources can be targeted to make a greater difference. The new database will help to sustain future strategic actions in terms of raising awareness of heart failure and its impact, and strongly support advocacy efforts. This is part of HFA's plans to achieve the ultimate alliance with the NHFS: forming HFA Quality of Care Centres. These centres will be based on the data extracted from HFA Atlas and will establish a strong Europe-wide HFA network."

"HFA Atlas is an essential source of information for the medical community, pharmaceutical companies, healthcare decision makers and politicians, which will contribute to the development of future strategies in diagnosis, treatment and expenditure."



Prof. Andreas Baumbach

Professor Andreas Baumbach, President of the European Association of Percutaneous Cardiovascular Interventions (EAPCI) promotes the equivalent of the HFA Atlas for interventional cardiology practice—the EAPCI White Book. "The EAPCI White Book is a fantastic initiative from the EAPCI community in collaboration with national Interventional Working Groups. The first edition, covering 2016, has incorporated data from 16 ESC member countries and provides a very informative overview of interventional cardiology activity and infrastructure across these countries."

"Through the rich data source that is the EAPCI White Book, we are seeing huge variations in the provision of services and new techniques in interventional cardiology."

"For example, there are marked differences in the provisions of diagnostic angiography and coronary angioplasty, particularly primary angioplasty for heart attacks. There is also a discrepancy in the update of new technologies to treat structural heart disease, e.g. transcatheter aortic valve implantation, mitral repair and left atrial appendage closure. Data from the first edition will be published soon and will also be presented and disseminated at national meetings. As well as supporting EAPCI efforts, these data will enable individual societies to work towards building a larger infrastructure, if

needed, or making treatment accessible to more patients in the case of under-served populations. Information can be shared with payers and regulatory authorities in order to address issues with reimbursement policies.

Data for 2018 are being gathered for the second edition where we hope to increase the number of participating countries. From now on, we will not only provide another snapshot of a certain year, but we will be able to document any dynamic changes in practice—this will help us assess guideline implementation and whether there has been any increase in adoption of new techniques."

Want to find out more about the ESC Atlas of Cardiology, HFA Atlas or the EAPCI White Book? Visit the ESC Stand or ask your National Cardiac Society about their contribution.

- 1. Timmis A, et al. *Eur Heart J* 2018;39:508-579.
- 2. Milinkovic I, et al. *Heart Failure* 2019; FP 1382. Available on ESC 365

Don't miss!

- Pursuing Health Equity: how to close the gaps in health care disparities Today, 15:45 - 16:45; Global Exchange 1 - ESC Plaza



How many LVAD implementations are performed in Slovenia and Kyrgyzstan?

ATLAS KNOWS

GO TO THE ESC STAND
Ask for a demo of the data on general cardiology, interventional cardiology and heart failure.

ESC Atlas: A unique compendium of cardiovascular statistics



Sessions of the day

7:30	
Colette	Cardiac imaging in the athlete: the fine line between physiology and pathology
Balzac	Solving dilemmas in pericardial diseases
Camus	Cardiogenic shock at 3 a.m. How to manage it?
Hugo	General cardiology crash course – Part 3
Agora 2	Therapeutic potential of extracellular vesicles in heart diseases
Duras	Exercise at the extremes - U-shaped curve for cardiovascular risk?
8:00	
Global Exchange 1	Meet the Trialist - DAPA-HF
8:30	
Tbilisi	Arrhythmia burden in adult congenital heart disease
Tashkent	Hot topics in deep vein thrombosis
Tallinn	Percutaneous interventions: Essential Update
Reykjavik	Cardiovascular drugs in acute coronary syndromes: when to start and when to stop
Centre Stage	Assist device-based PCI in cardiogenic shock. Recorded Live Procedure from Heart Center Leipzig, Germany
Hugo	Recent clinically relevant advances for the busy cardiologist
Pristina	“Tomorrow never dies”- Your role in basic science communities!
Case Corner 1	Lipids
Case Corner 2	Grown-up Congenital Heart Diseases
Prague	PCSK9 inhibitors: from cells to patients
Sofia	Risk assessment in acute coronary syndromes
Duras	Controversies in management of atrial fibrillation and non-ischemic dilated cardiomyopathy
Rome	Meet the Experts – Brugada Syndrome: all you need to know
Berlin	How should I treat ventricular arrhythmia in my device patient?
Sarajevo	Expert Advice – Heart failure management in women, the elderly and cancer patients
Astana	How should I treat resistant hypertension
Digital Health 1	Cardiac rehabilitation: is mobile health the way to go?
Colette	Cardio-oncology: what every cardiologist should know about cardiovascular effects of cancer treatment
Zagreb	Challenges and opportunities in managing rheumatic heart disease
Athens	Tackling the inflammatory side of atherosclerosis.
Nicosia	What is the best way to image myocardial ischemia? Organised with JCS
Camus	New approaches to tackle the global burden of cardiovascular disease. Organised with CSANZ
Science Box 1	Heart failure: from bench to bed
Science Box 2	Clinical applications of strain echocardiography
Agora 1	New data in carotid disease: From understanding the pathology to management
Agora 2	Prevention of thromboembolism and atrial remodelling in atrial fibrillation
Paris	2019 ESC/EAS Guidelines on Dyslipidaemias
Balzac	Late Breaking Science in Arrhythmias
Budapest	Late Breaking Science in Heart Failure 1
London	Late Breaking Science in Prevention 1
Helsinki	Late Breaking Science in Intervention
Amsterdam	Late Breaking Science in Imaging and Digital
9:00	
Global Exchange 1	Medical devices in the global era: balancing access, safety and innovation
Global Exchange 2	Reducing the burden of cardiovascular disease in the Americas
9:30	
ESC TV Stage	Meet the Trialist - COMPLETE
10:00	
ESC TV Stage	Meet the Trialist - NZOTACS
10:05	
Global Exchange 1	Research funding 360: supporting research and researchers in Europe and worldwide. Organised with the European Commission
10:10	
Digital Health 2	Remote Monitoring 1
Agora 1	Blockbusters from the Young – Role of imaging in patients with left ventricular hypertrophy
Agora 2	Blockbusters from the Young in atrial fibrillation and cardiac resynchronisation therapy

Sarajevo	The EHJ’s advances in heart failure and valvular heart disease. Organised with EHJ
Experts on the spot	Meet the Task Force of the 2019 ESC/EAS Guidelines on Dyslipidaemias
10:15	
Balzac	The chronic risk of venous thrombosis: tailoring extended prevention with NOACs. Sponsored by Bayer AG
Colette	Challenges in the management of atrial fibrillation patients undergoing cardiac interventions. Sponsored by Daiichi Sankyo Europe GmbH
Camus	Combinations of beta-blockers and angiotensin-converting enzyme inhibitors: what is the rationale? Sponsored by Servier
Hugo	Applying ODYSSEY Outcomes in your clinical practice - Who are the most appropriate patients for PCSK9 inhibitor treatment? Sponsored by Sanofi and Regeneron
Duras	Optimising non-vitamin K antagonist oral anticoagulant (NOAC) management in atrial fibrillation and acute coronary syndrome (ACS)/percutaneous coronary intervention (PCI) – Clinical practice perspective. Sponsored by The Bristol-Myers Squibb/Pfizer Alliance
10:20	
Rome	ESC Rene Laennec Lecture on Clinical Cardiology
10:30	
ESC TV Stage	Meet the Trialist - CONDI-2/ERIC-PPCI
11:00	
Amsterdam	Latest recommendations on the echocardiographic evaluation of diastolic function
Helsinki	Expert Advice - Best practice in acute coronary syndromes
Tallinn	Management of secondary mitral regurgitation in 2019
Reykjavik	Principles for a smooth cardiovascular drug therapy in the elderly
Centre Stage	Percutaneous mitral valve edge-to-edge repair. Recorded Live Procedure from Cleveland Clinic, Ohio, USA
Hugo	Cardiogenic shock during an intensive care unit night shift: how can machines help?
Pristina	Genomic Medicine: ready for prime time?
Case Corner 1	Infective endocarditis
Case Corner 2	Myocardial diseases
Nicosia	The predictive power of global longitudinal strain
Berlin	The substrate for ventricular arrhythmia – From ECG to non-invasive therapy
Sarajevo	Heart failure and diabetes: what is on the horizon
Tashkent	Advances in coronary imaging and physiology
Sofia	Antithrombotic therapy for coronary artery disease: opportunities and challenges
Duras	Controversies in heart failure
Budapest	New hope for HFpEF patients
London	Preventive cardiology: Essential Update Part 1
Prague	Expert Advice - Investigation and management of arrhythmias in athletes
Camus	Environment and cardiovascular health
Athens	Mechanisms behind intrinsic myocardial repair and regeneration
Tbilisi	Give me the evidence in adult congenital heart disease! Organised with ISACHD
Zagreb	Cardiomyopathies: genetic causes and precision medicine. Organised with JCS
Astana	Controversies in the management of hypertension. Organised with ESH
Balzac	The digital revolution in cardiology. Organised with ISCTR
Rome	Young Investigator Award Session - Clinical Cardiology
Science Box 2	Optimal treatment of coronary artery disease
Science Box 1	Update on infective endocarditis
Agora 1	Cardiac troponins and other biomarkers in acute coronary syndromes
Agora 2	The vascular inflammation coagulation interface
Colette	The European Exam on General Cardiology: what it is and how to prepare for it
Paris	Hot Line Session 3
Digital Health 1	Advances in digital health
Global Exchange 2	Reducing the burden of cardiovascular disease in Asia Pacific
11:15	
Global Exchange 1	Part II: Towards Integrity in Research. Interactive case presentations and discussions. Organised with the Ethics and Oversight Committee, CoT and SoT

12:30	
Digital Health 2	Data Analysis
Global Exchange 1	Challenges and opportunities for Cardiovascular Disease Research: The Strategic Research Agenda of ERA-CVD
12:40	
ESC TV Stage	Meet the Gold Medalist – Mariell Jessup
13:00	
Hugo	Achieving reperfusion for intermediate high-risk pulmonary embolism with ultrasound assisted catheter directed thrombolysis. Sponsored by BTG
Nicosia	Not all coronary pathology is of atherosclerotic origin - Learning from challenging cases. Sponsored by Cleveland Clinic
Athens	Evidence-based treatment of patients with SGLT-2is - What do we know and what is missing? Sponsored by MSD
Budapest	Hyperkalaemia and iron deficiency management in 2019 – Making the case for better outcomes and quality of life. Organised by Charité Universitätsmedizin Berlin, supported by an unrestricted educational grant from Vifor Pharma
Tallinn	Vascular protection - Which of your patients with chronic coronary artery disease will benefit? Sponsored by Bayer AG
Balzac	Translating data to practice: aspirin in high-risk patient subgroups. Sponsored by Bayer AG
Astana	Anticoagulation in the aging atrial fibrillation population - Perspectives from clinical trials and routine daily practice. Sponsored by Daiichi Sankyo Europe GmbH
Centre Stage	Spotlight on the effects of SGLT2 inhibition in heart failure (EBAC accredited). Supported by an unrestricted educational grant from AstraZeneca
Sofia	The role of cardiac biomarkers to aid in diagnosis and risk stratification of cardiac diseases. Sponsored by Roche Diagnostics International Ltd
Tashkent	Transforming diabetes management in cardiology: impact of novel therapies. Organised by PACE-CME, supported with an educational grant provided by Novo Nordisk
London	NOACs in patients undergoing cardiac procedures. Sponsored by Boehringer Ingelheim
Prague	Expanding opportunities for SGLT2i in clinical cardiology. Organised by PACE-CME, supported with an educational grant provided by Boehringer-Ingelheim/Lilly
Berlin	The north face in acute coronary syndromes: let’s climb it! Sponsored by Amgen Europe GmbH
Helsinki	The heart failure challenge: how well do you know HFpEF? Organised by Medscape Education, supported with an independent grant from Novartis Pharma AG
Sarajevo	Angina as a multifactorial clinical entity: broadening our therapeutic horizons. Sponsored by Servier
Rome	Anticoagulation for the management of venous thromboembolism in the non-vitamin K antagonist oral anticoagulant (NOAC) era. Sponsored by The Bristol-Myers Squibb/Pfizer Alliance
Zagreb	Reducing residual risk for cardiovascular disease – Omega-3 fatty acids in cardiology practice. Organised by Medscape Education, supported with an independent educational grant from Amarin
Camus	Beta blockers are not a homogeneous class. Sponsored by Menarini Group
Duras	I.V. Inodilators: why, when and how? Sponsored by Orion Pharma
Amsterdam	Evolving combination strategies in pulmonary arterial hypertension: one year after the 6th World Symposium of Pulmonary Hypertension. Sponsored by GSK
Pristina	Heart failure in 2019: latest update on implantable device therapy. Sponsored by Medtronic
Tbilisi	ON MED, OFF MED, Now what? Future of renal denervation. Sponsored by Medtronic
Colette	Coronary microvascular angina – Is it worthy to be diagnosed? Sponsored by Abbott
Reykjavik	A deep dive in to guidelines – Combination therapy, a cornerstone in CV risk reduction. Sponsored by Sanofi-Aventis Groupe
13:30	
Digital Health 2	m-Health in Acute Coronary Syndromes
13:45	
ESC TV Stage	Meet the Trialist - ISAR-REACT 5

14:00	
Global Exchange 2	Reducing the burden of cardiovascular disease in Africa
14:30	
Nicosia	Role of multi-modality imaging in cardiac sarcoid and amyloid detection
Sofia	Myocardial infarction and non-obstructive coronary arteries (MINOCA): what a headache!
Helsinki	Everything you should know about cardiac troponins
Duras	Controversies in the treatment of aortic valve disease
Tbilisi	Undiagnosed cardiac defects in the adult
Tallinn	Stroke prevention - Cardiologists have a central role!
Reykjavik	Targeting triglycerides to prevent coronary artery disease
Sarajevo	Management of advanced heart failure and end of life patients - A team approach
Berlin	Guidelines in Daily Practice - Syncope. Organised with the Slovak Society of Cardiology
Amsterdam	Advanced cardiac computed tomography Image Interpretation with the Masters
Pristina	Active Learning: CRISPR-Cas9 Genome Editing Bootcamp
Colette	Professor Braunwald's perspective on lipid lowering
Digital Health 1	Cardiovascular innovation: the next frontier
Case Corner 1	ECG Masterclass
Case Corner 2	Pulmonary circulation
Hugo	Complications from congenital heart disease: unusual connections need unusual answers
Zagreb	15 years of TAVI: increasing evidence for routine use
Tashkent	Advances in peripheral arterial disease
Rome	Expert Advice - Risk prediction for sudden cardiac death in inherited cardiac condition
Budapest	Meet the Experts - Heart failure drug therapy in patients with co-morbidities
Astana	Meet the Experts - Management of hypertensive emergencies
London	Preventive cardiology: Essential Update Part 2
Athens	Genome editing for heart disease.
Centre Stage	It starts at the top - Leadership and clinician wellness. Organised with ACC
Balzac	The new Circulation: expanding frontiers. Organised with the Circulation Journal
Camus	Variation in CVD across Europe: challenges in closing the gap
Prague	Supporting patients with cardiovascular disease to improve outcomes
Science Box 1	Progress in secondary prevention - New treatments
Science Box 2	Cancer and the heart: novel insights from bench to bedside
Agora 1	Multimodality imaging in cardiomyopathy
Agora 2	Physical activity, exercise, and sports
Paris	2019 ESC Guidelines on diabetes, pre-diabetes, and cardiovascular diseases developed in collaboration with the EASD
15:30	
Global Exchange 2	2019 New WHO cardiovascular risk charts
15:40	
ESC TV Stage	Meet the Trialist - HISTORIC
15:45	
Global Exchange 1	Pursuing Health Equity: how to close the gaps in health care disparities
Digital Health 2	m-Health in Arrhythmias
15:50	
Agora 1	Blockbusters from the Young - Cutting edge in heart failure
Agora 2	Blockbusters from the Young in coronary artery disease
Centre Stage	Meet the Task Force 2019 ESC Guidelines on diabetes, pre-diabetes, and cardiovascular diseases developed in collaboration with the EASD
Tashkent	ESC Andreas Grüntzig Lecture on Interventional Cardiology
16:00	
Balzac	International Aspirin foundation - Where are we now and where are we going. Organised by the International Aspirin Foundation, supported with an unrestricted grant from Bayer AG

Colette	Antithrombotic therapy in atrial fibrillation patients post-percutaneous coronary intervention: guidance from both sides of the Atlantic. Sponsored by Boehringer Ingelheim
Duras	Discussing the opportunities for SGLT2 in clinical cardiology. Organised by PACE-CME, supported with an educational grant provided by Boehringer-Ingelheim/Lilly
Hugo	The north face in acute coronary syndromes: let's climb it! Sponsored by Amgen Europe GmbH
Camus	How well do you know HFpEF? Meet the experts. Organised by Medscape Education, supported with an independent grant from Novartis Pharma AG
16:10	
ESC TV Stage	Meet the Trialist - Combined effect of lower LDL-C and lower SBP on the lifetime risk of cardiovascular disease
16:40	
Duras	Controversies in imaging coronary artery disease
Nicosia	Novel technologies and artificial intelligence in cardiovascular imaging
Tbilisi	Advances and unmet needs in chronic thromboembolic pulmonary hypertension around the globe
Tallinn	Aorta and peripheral vascular disease: Essential Update
Rome	Patient centered care in atrial fibrillation
Sofia	Guidelines in Daily Practice - Myocardial Revascularisation. Organised with the Latvian Society of Cardiology
Sarajevo	Heart Failure - The "Big Picture". Organised with the Portuguese Society of Cardiology
Camus	Pathology for cardiac imaging of acquired and hereditary cardiac diseases
Amsterdam	The right heart in echocardiography Image Interpretation with the Masters
Centre Stage	Let's Talk About Strategy - Case Discussions with the Masters
Case Corner 1	Challenging cases in Valvular Heart Disease
Case Corner 2	Holes in the heart
Hugo	A bag of trouble: lessons in myocardial and pericardial disease
Digital Health 1	Heart health on the move
Reykjavik	Cardiac evaluation of athletes to prevent sudden death
Pristina	What's new in genetics of heart disease
Zagreb	New treatments for pulmonary vascular disease
Tashkent	Advances in transcatheter mitral valve repair
Berlin	How to get the most out of cardiac resynchronisation therapy?
Budapest	Expert Advice - Optimising the organisation of heart failure care
Astana	Hypertension : what you need to know as you age
London	Guidelines in Practice - Cardiovascular disease in pregnancy
Athens	The ageing cardiovascular system: anything that can slow down the process?
Helsinki	Antithrombotic therapy in patients with acute coronary syndromes. Organised with CSC
Prague	SGLT2 inhibitors and cardiovascular outcomes. Organised with EASD
Science Box 2	Acute heart failure: new treatment updates
Science Box 1	New insights from translational CMR
Agora 1	Novel echocardiography techniques for heart failure
Agora 2	Influence of metabolic or infection disease on the heart
Paris	Hot Line Session 4
Balzac	Advances in valvular heart disease
17:00	
ESC TV Stage	French Cardiology Pioneers. Organised with the French Society of Cardiology
18:00	
FESC Lounge	Awards Ceremony
ESC TV Stage	The Daily Wrap-Up
18:15	
Amsterdam	Obesity care in people with cardiovascular disease: a neglected front? (Submitted for EACCME accreditation). Organised by International Medical Press, supported by an educational grant from Novo Nordisk A/S
Colette	Circulation: cardiovascular imaging - Editors' picks. Sponsored by AHA and Wolters Kluwer
Duras	Latest advances in the management of mitral and tricuspid regurgitation. Sponsored by Edwards Lifesciences
Centre Stage	Insights and innovation - Can we alter the course of atherosclerotic cardiovascular disease? Sponsored by the Medicines Company

Today in the ESC Professional Members' Lounge		
09:00 - 09:15	Make the most of your benefits: ESC CardioMed is evolving - New 3D enhancement	
09:30 - 09:45	Make the most of your benefits: support for publication in a journal: Enago	
10:00 - 10:30	Core Curriculum	
10:30 - 11:00	ESC Grants - Women Transforming Leadership Programme	
11:00 - 12:00	World Café	
11:00 - 11:15	Make the most of your benefits: ESC 365	
11:30 - 12:00	ESC Cardio Talk	
12:00 - 12:30	Career development: Be a Twitter Pro	
12:30 - 13:00	Make the most of your benefits: ESC CardioMed	
13:00 - 13:30	Quiz on science, education, membership and fellowship	
13:30 - 14:00	Reverse mentoring	
13:30 - 14:00	Find out more about ESC Grants	
14:00 - 14:30	Education online (ESCel, Webinar, Clinical Case) / e-Learning offer at ESC	
14:45 - 15:15	ESC Cardio Talk	
15:15 - 15:30	Make the most of your benefits: My ESC Account	
15:40 - 16:40	Professional Horizons (Experts from Associations and Women in ESC)	
16:00 - 16:30	Career development: Be a Twitter Pro	
16:30 - 16:40	Make the most of your benefits: support for publication in a journal: Enago	

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2019

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ESC 365

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9

COMPLETE shows that non-culprit lesion revascularisation reduces hard outcomes for STEMI with multivessel disease

“Complete revascularisation is likely to prevent many thousands of recurrent heart attacks on a global basis every year compared with culprit-lesion-only percutaneous coronary intervention (PCI).” So says Professor Shamir R. Mehta (Population Health Research Institute, Hamilton, Ontario, Canada), who gave yesterday’s Hot Line presentation of the COMPLETE trial results, which will be published simultaneously in the New England Journal of Medicine.¹

“How to best manage the non-culprit lesions in patients with ST-elevation myocardial infarction (STEMI) and multivessel coronary artery disease has been a dilemma for some time,” explains Prof. Mehta. “While there have been some well-conducted randomised clinical trials of routine non-culprit lesion PCI, none have been powered to determine whether non-culprit PCI prevents hard endpoints such as cardiovascular (CV) death or myocardial infarction (MI).”

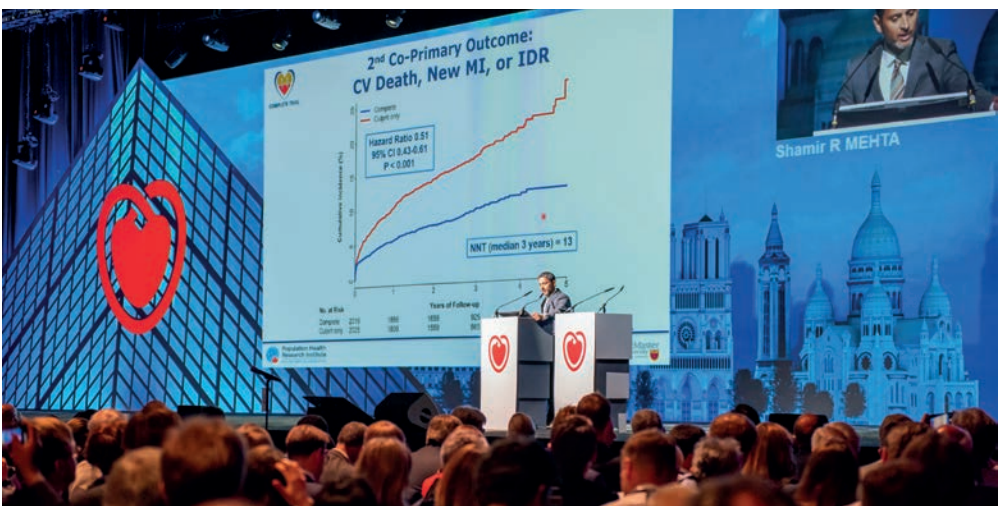
The large multinational COMPLETE trial was a comparative-effectiveness study that was powered to determine whether routine angiographically-guided PCI of significant non-culprit lesions, performed as a staged procedure, would prevent CV death or MI, compared with optimum guideline-directed medical therapy alone. “By concentrating on hard clinical endpoints, the study minimised the possible bias associated with the open-label design and focus on revascularisation as the sole endpoint driving possible benefit,” says

Prof. Mehta. “We also wanted to look at the optimal timing of revascularisation, because there are conflicting data from prior trials about this. So patients were stratified according to whether PCI was to be conducted during the index hospitalisation or at a later date.”

The trial involved 4,041 patients from 140 centres in 31 countries who had undergone PCI of the culprit lesion. All coronary angiograms were evaluated in a central angiographic laboratory for lesion complexity, SYNTAX score, complications and results of PCI. The first co-primary outcome was a composite of CV death or MI, with the second co-primary endpoint including an additional element of ischaemia-driven revascularisation.

Complete revascularisation led to a 26% reduction in the risk of CV death or MI and a 49% reduction in the risk of CV death, MI or ischaemia-driven revascularisation.

At a median follow-up of 3 years, the benefits of complete revascularisation over culprit-only PCI were highly significant for both co-primary outcomes: the rate of CV death or MI (7.8% vs 10.5%; hazard ratio [HR] 0.74; 95% confidence interval [CI] 0.60-0.91; p=0.004) and the rate of CV death, MI or ischaemia-driven revascularisation (8.9% vs 16.7%; HR 0.51; 95% CI 0.43-0.61; p<0.001). “Results were driven largely by a reduction in new MI, mainly type 1 (spontaneous) MI,” says Prof. Mehta.



In terms of safety, there was no significant difference between treatments in any of the safety outcomes, including stroke (p=0.27) and major bleeding (p=0.15). Overall contrast-induced nephropathy was not different between the groups, but there was a small excess in those receiving early non-culprit lesion PCI.

The impact of the timing of non-culprit lesion PCI on outcomes has important clinical implications. “We found that the benefit of complete revascularisation was similar when non-culprit PCI was conducted early—at a median of one day during the index hospitalisation (HR 0.77; 95% CI 0.59-1.00)—or when it was performed several weeks after hospital discharge (HR 0.69; 95% CI 0.49-0.97),” says Prof. Mehta. “The reason for this is probably because the benefit of complete revascularisation, at least on CV death or MI, seems to emerge over the long term. Most early events after

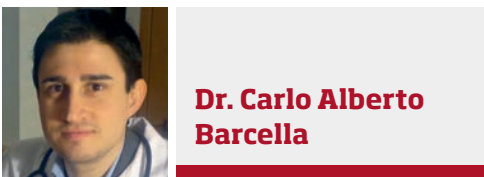
STEMI are likely due to the underlying severity of the index infarction itself, rather than the non-culprit lesion.”

The COMPLETE trial is the first randomised trial to show the benefits of complete revascularisation, involving culprit and non-culprit lesions, on hard CV outcomes in patients with STEMI and multivessel disease. “Our data confirm what has been suggested in previous trials, that this strategy leads to a clinical benefit for these patients,” says Prof. Mehta. “In our trial, a patient’s risk of having another heart attack was cut by about one-quarter. That degree of benefit usually leads to a change in clinical practice.”

1. Mehta SR, et al. N Engl J Med 2019. doi/10.1056/NEJMoa1907775

Don’t miss!
• **Meet the Trialist - COMPLETE**
Today, 09:30 – 10:00; ESC TV Stage – ESC Plaza

Psychiatric disorders and cardiac arrest – more common and less survival



Dr. Carlo Alberto Barcella

Cardiovascular disease (CVD) disproportionately impacts people with psychiatric disorders. This may be attributed to several causes, such as the cardiovascular side effects of psychotropic drugs (e.g. weight gain, metabolic disturbances and QT-prolongation), unhealthy lifestyle, and illicit drug and alcohol abuse. The risk of CVD is compounded by pathophysiological mechanisms of mental illness, such as autonomic dysfunction, systemic inflammation, increased platelet reactivity and endothelial dysfunction.

Young Investigator, Doctor Carlo Alberto Barcella (Gentofte University Hospital, Copenhagen, Denmark) presents two abstracts investigating cardiac arrest in patients with psychiatric disorders using the nationwide Danish Cardiac Arrest Registry (Abstracts 2285 and P4135). He says, “In patients

with psychiatric disorders, especially those with schizophrenia or bipolar disorder, life expectancy is 10-20 years shorter than in the general population, primarily due to the high CVD burden. But little is known about the risk of out-of-hospital cardiac arrest (OHCA)—studies conducted have included too few events.”

Yesterday, in a Blockbusters from the Young session, Dr. Barcella presented a case-control study where adult patients with an OHCA of presumed cardiac cause between 2001 and 2015 (n=35,005) were matched with up to five controls from the general Danish population. Schizophrenia, bipolar disorder, depression and personality disorders were found to be associated with higher risk of OHCA in a dose-response manner. No overall association with OHCA for anxiety was observed, except in patients with severe disorders.

Today, Dr. Barcella will also present a study investigating differences in in-hospital cardiovascular procedures following OHCA in patients with and without psychiatric disorders. He says, “We know there are disparities in healthcare provisions for patients with psychiatric disorders and we wanted to know if these differences extend to an acute and life-threatening condition

such as cardiac arrest.” Of 7,288 patients hospitalised after OHCA, 22.8% had a psychiatric disorder. Compared with non-psychiatric patients, patients with psychiatric disorders had around half the chance of receiving an acute coronary angiography and around a 30% lower probability of implantation of a cardioverter-defibrillator during the post-arrest hospitalisation, but the same probability of coronary revascularisation once angiography had been performed. However, patients with vs without psychiatric disorders showed an approximate 30% lower 30-day and 1-year survival following OHCA, irrespective of the performance of acute angiographic procedures.

Dr. Barcella theorises why these differences were observed: “Sadly, there may be a degree of stigmatisation by physicians. A higher prevalence of unfavourable cardiac arrest factors—such as non-shockable heart rhythm or no bystander cardiopulmonary resuscitation—or patient-related characteristics—such as higher burden of comorbidity, higher rates of postoperative complications, lower tolerance to intensive treatment or poor adherence to the therapy—may discourage physicians from offering invasive procedures to patients with psychiatric disorders.”

These findings further highlight the large burden of cardiovascular morbidity and mortality in patients with psychiatric disorders. More can be done to help these vulnerable patients in terms of early cardiovascular risk factor screening and timely CVD management to prevent cardiac arrest. Once cardiac arrest has occurred, these patients should receive the same aggressive acute cardiac post-resuscitation management used for the general population.

Don’t miss!
• **Neuropsychiatric disease, substance abuse and the heart**
Today, 15:45 – 16:35; Moderated ePoster 2 – Poster Area

More interesting abstracts:
• **Concomitant oral anticoagulant and antidepressant therapy in patients with atrial fibrillation and risk of stroke and bleeding: a population based cohort study (Abstract P4745)**
Today, 14:00 – 18:00; Poster Area
• **Pre-existing depression significantly improves after transcatheter aortic valve implantation (TAVI): analysis of long-term effects and screening for novel biomarkers (Abstract P5579)**
Tuesday, 08:30 – 12:30; Poster Area

Why the world’s biggest killer misses out on vital research funding



Prof. Tomasz Guzik



Prof. Lina Badimon

Cardiovascular disease (CVD) receives substantially less funding than other non-communicable diseases, including cancer. More than 10,000 patients die of CVD every day in Europe, and CVD is expected to remain the top reason for death, premature death and disease burden in Europe over the next 20 years.

Chair of the ESC Research and Grants Committee, Professor Tomasz Guzik (University of Glasgow, Glasgow, UK), thinks that research in CVD is a victim of its own success to some extent. “There have been significant improvements in cardiovascular health over the last few decades. However, these successes have led to the impression that CVD is no longer such a big problem. Interest in CVD research has been overtaken by a focus on other diseases, for which risk or mortality are perceived to be higher.”

ESC Advocacy Committee Chair, Professor Lina Badimon (IR-Hospital de la Santa Creu I Sant Pau, Barcelona, Spain) agrees, saying “This is a dangerous misconception—there is an emerging epidemic of chronic CVD, due to the ageing population, improved CVD survivorship and the cardiovascular complications of other diseases, such as diabetes, and of other treatments, including cancer chemotherapy.”

“We must find ways to make people realise that CVD is still the number one killer in the world and that more funding for CVD research is urgently needed.”

The size and cost of CVD clinical trials is a considerable barrier to funding, thinks Prof. Badimon. “Because CVD trials need to include so many patients, they are much more expensive than trials in some other therapeutic areas. We need to create smart, integrated and innovative approaches to convincingly demonstrate efficacy; for example, using different endpoints, such as quality of life or imaging, so that fewer patients are required. We can also learn from precision medicine and target specific groups of patients.”

Describing current funding opportunities for CVD research within Europe, Prof. Badimon cites two major sources. “National funding tends to come in the form of peer-reviewed grants. In a few countries, there are charities,

and in a few others, there are private foundations that also contribute to fund medical research. More lucrative, but more difficult to obtain, are peer-reviewed EU-funded grants, which are usually awarded to consortia and focus on well-coordinated projects with a high relevance to the disease area. Also difficult to obtain, with not very many given out per each single call, are European Research Council (ERC) grants awarded to individual investigators.”

Prof. Badimon believes that advocacy will increase funding awarded to CVD research and help prioritise where need is greatest. To help shape CVD research priorities within the EU, the ESC, as part of the European Research Area Network on CVD (ERA-CVD), has developed the Strategic Research Agenda for CVD (SRA-CVD) to be ready for Horizon Europe (2021-2027), the next EU Framework Programme for Research after Horizon 2020.

“The ESC Advocacy Committee is trying to make politicians and the general public realise that there are many problems in CVD for which we still don’t have the answers. We have to talk to politicians in each EU country and convince them of the importance of public policies to tackle and prevent CVD. We also need to take the message directly to Brussels that CVD mortality is no longer going down and may even be taking an upward turn.”

Prof. Guzik outlines some of the other ways the ESC is supporting research funding.

“The creation of the ESC Research and Grants Committee—which coordinates grants and ensures proposals are assessed on the basis of excellence and relevance—is a reflection of the Society’s commitment to the future of cardiovascular science.” The ESC is involved in a number of projects supporting CVD research and its funding, he says. “The ongoing EU-funded CardioScape II analyses the landscape of CVD research funding in Europe, giving an important insight into its past, present and future. ESC is also championing EuroHeart, an innovative federation of European registries that links treatment of CVD throughout European hospitals with survival. This project has a huge potential for improving the quality of cardiovascular care throughout Europe.”

Together, they conclude, “The ESC is determined to strengthen its efforts to raise public and political awareness and to secure funding with the hope that it can demote CVD from its position as the world’s top killer disease.”

Don’t miss today!

- **Research funding 360: Supporting research and researchers in Europe and worldwide**
10:05 - 11:00; Global Exchange 1 - ESC Plaza
- **Challenges and opportunities for cardiovascular disease research: The Strategic Research Agenda of ERA-CVD**
12:30 - 13:30; Global Exchange 1 - ESC Plaza

Inhaled miR-133-loaded nanoparticles restore cardiac performance

In a Science Box session this morning, Doctor Daniele Catalucci (National Research Council-Institute of Genetic and Biomedical Research and Humanitas Research Hospital, Milan, Italy) will present results showing that a novel inhaled miR-133-loaded nanoparticle delivery approach can prevent cardiac dysfunction in an experimental model (Abstract 3072).

Non-coding micro-RNAs (miRNAs), like miR-133, are implicated in cardiovascular diseases and their downregulation within the myocardium has been observed in cardiac pathologies.¹ Restoring levels may repair myocardial damage but effective delivery of exogenous miR-133 has been elusive. Inspired by the way that inhaled ultrafine pollution particles reach the heart via the circulation, Dr. Catalucci and his team began working with inhaled non-toxic, biodegradable nanoparticles as a way of directly targeting cardiomyocytes. Providing protection against RNase degradation, the calcium-phosphate nanoparticles (CaPs) are negatively charged so as to be attracted to polarised cells, such as cardiomyocytes.² Once at the cells, the nanoparticles are internalised and release miR-133. This direct, non-invasive approach bypasses hepatic, renal and gastric degradation, meaning that relatively low doses of miR-133 would be required.

Dr. Catalucci and his team used the transaortic constriction (TAC) to induce ventricular pressure overload and heart failure in mice. TAC and non-TAC groups received either saline, CaP-miR-133, miR-133 alone or unloaded CaPs alone, delivered by intratracheal nebulisation

on alternate days for four consecutive weeks. Echocardiographic analyses were performed at two and four weeks after surgery.

Notably, CaP-miR-133 led to reversal of heart failure progression, with preservation of left ventricular internal diameter, ejection fraction and fractional shortening, together with a reduction in myocardial fibrosis.

The improvement in cardiac function was associated with restoration of cardiomyocyte levels of miR-133.

CaP-miR-133 administration was not associated with any major changes in immunological status. No beneficial effects were seen with miR-133 alone or unloaded CaPs alone.

“This proof of concept has never been shown before for miRNAs and inhalation,” says Dr. Catalucci. “This important work represents a European collaboration between academia and industry (CUPIDO project, www.cupidoproject.eu) and we are now in the process of scaling up production ready for evaluation in large-animal models, with the hope it might lead to a first-in-class investigation in humans.”

1. Di Mauro V, et al. Noncoding RNA Res 2018;3:12-19.
2. Di Mauro V, et al. Nanomedicine (Lond) 2016;11:891-906.

Don’t miss today!

- **Myocardial delivery of therapeutic miR-133 via inhalable nanoparticles prevents the pathologic development in a model of ventricular pressure overload**
Heart failure: from bench to bed
08:30 - 10:00; Science Box 1 - Poster Area

End-of-life in heart failure: A multidisciplinary team-patient partnership



Prof. Tiny Jaarsma



Dr. Loreena Hill

Ahead of this morning’s symposium, Doctor Loreena Hill (Queen’s University, Belfast, UK) and Professor Tiny Jaarsma (Linköping University, Linköping, Sweden), Coordinator and Co-Coordinator, respectively, of the Palliative Care Taskforce of the Heart Failure Association, discuss the importance of integrating multidisciplinary team treatment decisions with patients’ wishes in advanced heart failure.

Dr. Hill says that a change of focus from a curative to a more palliative approach should be more readily accepted by the multidisciplinary team when there is continual and irreversible deterioration in signs and symptoms indicating treatment options are becoming limited. “However,” she explains, “the central players in the decision should always be the patient and their family. Many heart failure patients remain optimistic about the potential length of life left to live. This dilemma is made more complex by the introduction of new

advanced devices and surgical interventions. But at some point, the team along with the patient and their family should prioritise quality of life as a management goal.” Previously, care of heart failure patients at this stage would have been ‘handed over’ to the specialist palliative care team. “Currently,” says Dr. Hill, “the move is towards a shared-care process involving all team members, integrating specialisms and disciplines including allied professionals, providing seamless care extending across the different centres at which the patient is treated.”

Communication with patients and their families is extremely important in late-stage disease, says Prof. Jaarsma. “In cardiology, we are not used to talking about dying. Doctors and nurses do not want to take away hope and may try to avoid these conversations. But most patients will eventually want to know what the future holds and we need to be honest with them and provide support.” Prof. Jaarsma recognises that it is not easy to know when to have these conversations. “It is often the elephant in the room. Patients might want to ask but are afraid to hear the answer,” she says. “To help patients take the initial step, our team developed a prompt list that patients can hand to their healthcare professional indicating issues they would like to discuss. Every team member should learn good communication skills because the subject could arise at any patient visit and we all need to be prepared to handle it empathetically.”

Don’t miss today!

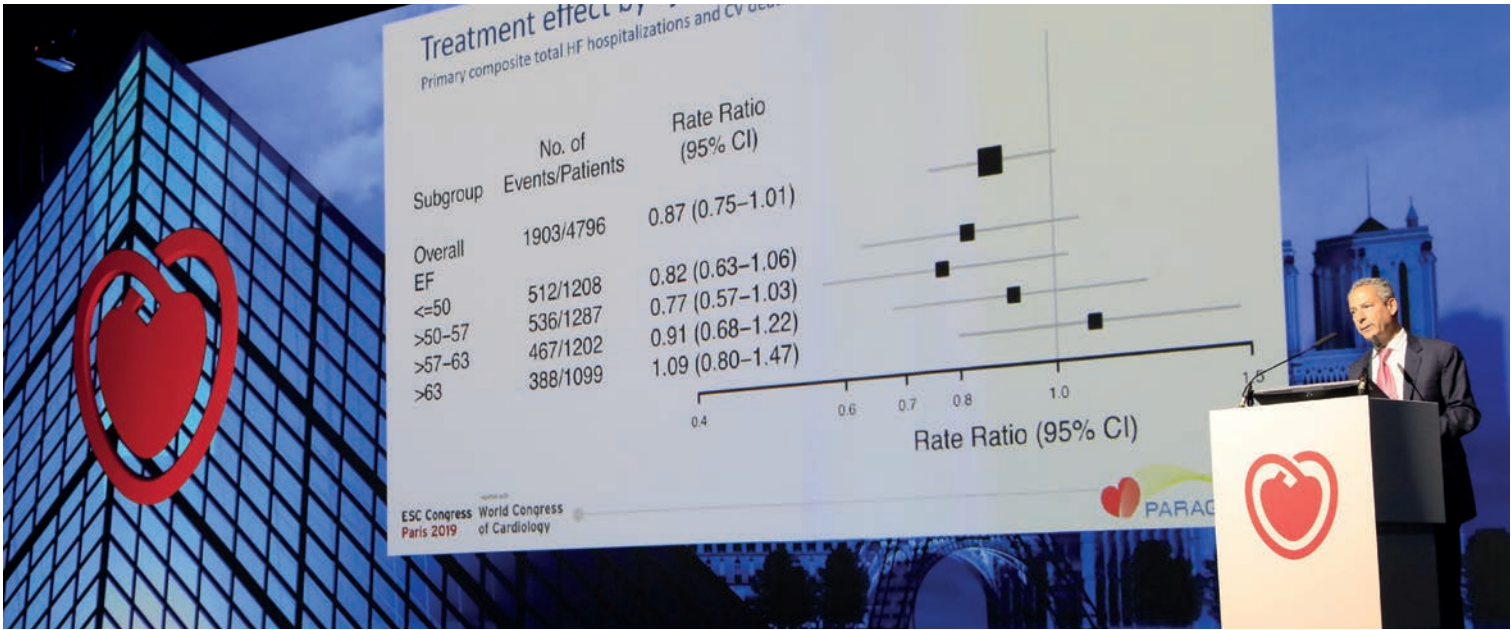
- **Management of advanced heart failure and end of life patients - A team approach**
14:30 - 15:40; Sarajevo - Village 5

PARAGON-HF: Do patients with HFpEF benefit from sacubitril/valsartan?

The PARAGON-HF trial narrowly missed its primary endpoint but demonstrated promising, clinically meaningful benefits with sacubitril/valsartan in some subgroups of patients with heart failure (HF) with preserved ejection fraction (HFpEF).

That was the take-home message from yesterday's Hot Line presentation of the PARAGON-HF trial, which was simultaneously published in the *New England Journal of Medicine*.¹ Presenter and PARAGON-HF Executive Committee Co-Chair, Professor Scott Solomon (Brigham and Women's Hospital, Harvard Medical School, Boston, MA, USA) explains the rationale for the study. "Half of all patients with HF have HFpEF but unlike for HF with reduced ejection fraction (HFrEF), we still have no evidence-based therapies for this condition. We know from the PARADIGM-HF trial—which was reported exactly 5 years ago at ESC Congress—that sacubitril/valsartan has outcome benefits in HFrEF.² Added to that is the evidence showing that the combination reduced NT-proBNP levels more than valsartan alone from the phase II PARAMOUNT trial in HFpEF.³ The logical step was to investigate the effects of sacubitril/valsartan on hard outcomes in HFpEF."

PARAGON-HF is the largest randomised trial performed in HFpEF to date, with 4,822 patients from 43 countries randomised to receive sacubitril/valsartan or valsartan alone. Patients were required to have a left ventricular ejection fraction (LVEF) \geq 45%, natriuretic peptide elevation and evidence of structural heart disease. The primary endpoint was a composite of total HF hospitalisations (first and recurrent) and cardiovascular (CV) deaths, analysed in a recurrent-event analysis. With a median follow-up of 35 months, only 9 patients were lost to follow-up.



"Sacubitril/valsartan reduced the primary endpoint by 13% (rate ratio 0.87; 95% confidence interval [CI] 0.75–1.01) but this just failed to reach statistical significance, with a p value of 0.059," says Prof. Solomon. The results were driven by a reduction in HF hospitalisations, with the combination having no advantage over valsartan alone in CV deaths. Safety was similar to that seen in the PARADIGM-HF trial, sacubitril/valsartan being associated with a higher rate of hypotension but lower rates of hyperkalaemia and renal dysfunction than the comparator.

"While overall the benefit was just short of statistical significance," says Prof. Solomon, "analyses indicated benefits on secondary endpoints, including an increase in the number of patients with New York Heart Association class improvements and a reduction in those diagnosed with worsening renal failure." And the team observed striking heterogeneity among the population enrolled in the response to treatment, with women and patients with an LVEF at or below the median of 57%

responding much more dramatically than others. "Just over half of the patients enrolled, 52%, were women. And in women we saw a 27% reduction in the primary endpoint with sacubitril/valsartan (rate ratio 0.73; 95% CI 0.59–0.90). We need to understand why women derived more benefit than men in this trial, but it is of note that women who develop heart failure are much more likely to have HFpEF than HFrEF," observes Prof. Solomon.

Patients with an LVEF \leq 57% had a reduction in the primary endpoint of 22% (rate ratio 0.78; 95% CI 0.64–0.95).

Prof. Solomon comments, "The finding that patients with lower LVEF benefitted from sacubitril/valsartan makes a lot of sense. These patients had an ejection fraction that was not frankly reduced, according to the conventional definition of 40% or less, but that was clearly below normal, which is generally considered 55% or greater. Given the demonstration from PARADIGM-HF that

sacubitril/valsartan is effective in patients with LVEF \leq 40%, it follows that it may also benefit patients in the adjacent LVEF range."

Prof. Solomon along with PARAGON-HF Co-Chair, Professor John McMurray (University of Glasgow, Glasgow, UK) and their team are continuing to analyse the extensive dataset to try to understand which patients may most benefit from sacubitril/valsartan. Prof. Solomon has confidence in the benefit of sacubitril/valsartan for some patients, concluding, "We believe our findings may translate into clinically worthwhile benefits for certain groups of patients, particularly those with HF with ejection fraction that is not in the conventional 'reduced' range, but is below normal."

1. Solomon SD, et al. N Engl J Med 2019. doi/10.1056/NEJMoa1908655
2. McMurray JJ, et al. N Engl J Med 2014;371:993-1004.
3. Solomon SD, et al. Lancet 2012;380:1387-1395.

Replay the video and slides on ESC 365: www.escardio.org/365

The global burden of CVD: Pulling together to push for change



Prof. Fausto Pinto

How can plans to tackle the global burden of cardiovascular disease (CVD) be translated into concrete actions that will have the wide-ranging impact needed to improve cardiovascular health on the huge scale needed? Professor Fausto Pinto (University of Lisbon, Lisbon, Portugal), President-Elect of the World Heart Federation (WHF) shares his thoughts on what needs to be done to make real progress in this area.

"Scientific societies have a very relevant role to play, because they are a focus for evidence generation that can be used to support calls for public health measures, for example, restricting the salt content of food, to be incorporated into legislation. Organisations, such as the ESC and the WHF have dedicated advocacy groups that are working with different stakeholders, including governments, to promote a range of measures. Working in concert with the societies are the foundations and patient associations, which are vitally important in helping to raise awareness among the general population about CVD and in disseminating the societies' recommendations for reducing the incidence and effects of the disease.

Something the global community really needs to work on is prevention. If you look at healthcare budgets around the world, around 92–94% is used to treat disease, with only 4–6% being allocated to prevention. A major task for national decision-makers is to increase the support for prevention, but each country also has its own particular issues and many global measures need to be translated into local realities. This is where the national societies and local groups, who understand the local problems, really count, and they can work together with decision-makers to effect change.

There is no overlooking the fact that low-income countries are distinctly disadvantaged due to a lack of access to innovative medicines and technologies. Scientific societies and

foundations have a responsibility to highlight these inequalities and, while it may seem utopian, work towards providing access to innovation for all. After all, access to innovation should be a human right.

A lot of work is being done by different stakeholders to try to address the growing CVD burden that we are having to deal with as a medical community, as a scientific community and as a global community—but, we can always do more and we will need to do it together."

Don't miss!

• **New approaches to tackle the global burden of cardiovascular disease**
Today, 08:30 – 10:00; Camus – The Hub

New World Heart Federation Global Roadmaps: Translating science into policy



As part of its effort to support the World Health Organization (WHO) and the United Nations goals to reduce premature mortality from non-communicable diseases (NCDs), in 2014, the World Heart Federation (WHF) undertook an initiative to develop a series of Global Roadmaps.

These documents aim to promote the development of national policies and health systems approaches and to provide strategies for overcoming any roadblocks on the pathway to effective prevention, detection and management of cardiovascular disease (CVD). Roadmaps provide guidance for countries to develop or update national NCD programmes using the framework provided by the WHO Global Action Plan for the Prevention and Control of NCDs 2013-2020.

The overall aim is to drive efforts within national agendas to reach the ambitious Sustainable Development Goal target of achieving a 30% reduction of NCDs by 2030

Adding to existing documents on secondary prevention, raised blood pressure, tobacco control, cholesterol, rheumatic heart disease and non-valvular atrial fibrillation, today, the WHF will launch two new Roadmaps:

WHF Global Roadmap on Heart Failure

As care for patients diagnosed and living with heart failure involves the family, nurses, dieticians, public health experts, general physicians, cardiologists and dedicated heart failure specialists, the **WHF Global Roadmap on Heart Failure** is relevant for all professionals caring for patients with this condition. It is unique in its aims to provide comprehensive guidance on the complex syndrome of heart failure from a global perspective, outlining a graphical display of the pathway for heart failure continuum of care; roadblocks for treating and managing patients; possible solutions for overcoming obstacles to prevention, diagnosis, treatment and monitoring; summary of evidence-based therapies that have shown improved outcomes for patients; and recommendations on how to adapt and implement the Roadmap at a local level.

With the overall objective of reducing the burden of heart failure in every corner of the world, this Roadmap provides cardiac societies, foundations and associations, policy and decision makers with a framework to guide initiatives within their national context; catalyse initial discussions and plan a call to action; inform Roundtable discussions with key opinion leaders; or simply to leverage support and raise awareness of the importance of heart failure in reaching global targets for NCDs. The power of this document lies in its flexibility and consideration of global efforts to improve heart

failure management, such as the American Heart Association's 'Rise Above Heart Failure' campaign and work carried out by the ESC's Heart Failure Association, the Asia Pacific Society of Cardiology, the Heart Failure Society of Singapore and the South African Heart Failure Society, among others.

Don't miss!

- **The launch of the WHF Global Roadmap on Heart Failure at: 'Expert Advice - Optimising the organisation of heart failure care'**
Today, 16:40 - 17:50; Budapest - Village 5

WHF Global Roadmap on the prevention of cardiovascular disease among people living with diabetes

Worldwide, 425 million people are affected by diabetes mellitus, which is associated with a two-fold increase in the risk of all major stroke subtypes, coronary heart disease, myocardial infarction, sudden death and angina pectoris compared with patients without diabetes. Three quarters of people with diabetes are living in low-resource settings.

Despite the burden of diabetes worldwide, diagnosis and treatment of diabetes continues to be suboptimal. It is estimated that as many as 212.4 million people or half of all people 20-79 years with diabetes globally are unaware of their disease.

Given the epidemic global impact, action must be taken. Focusing on the patient

care pathway and the prevention and management of CVD among diabetes patients, the **WHF Global Roadmap on the prevention of CVD among people living with diabetes** draws from the expertise of a group of cardiovascular and diabetes expert clinicians, researchers, implementation science experts and patients from across all continents.

The Roadmap, developed in partnership with the International Diabetes Federation (IDF), is a key reference document on the prevention of CVD among people living with diabetes, outlining a vision of an ideal pathway-of-care, roadblocks along this pathway and evidence-informed solutions, with examples from practice. It provides an essential framework for all involved in the planning, organisation, patient management and implementation of approaches related to CVD prevention in people living with diabetes.

Don't miss!

- **The launch of the WHF Global Roadmap on the prevention of CVD among people living with diabetes at: 'Heart failure and diabetes: what is on the horizon'**
Today, 11:00 - 12:30; Sarajevo - Village 5

Find out more about new and existing WHF Global Roadmaps at www.cvdroadmaps.org

Big data – big problems or big solutions?



Prof. Martin Cowie

The term 'big data' provokes many questions, from 'What is it?' to 'What is its place in clinical medicine?' or even 'Will I be replaced by a computer?'

Professor Martin Cowie (Imperial College London, London, UK), Chair of ESC's Digital Health Committee explains, "With so many questions, the ESC wants to give delegates a broader understanding of the tools available and the directions that big data and associated information-processing techniques may take us. Navigating this dynamic fast-moving area is difficult—we don't want to be drowned in a tsunami of data, but we should take what's valuable from these approaches to maximise benefit for patients and healthcare systems."

There are concerns that artificial intelligence and machine learning may replace human intelligence with regards to clinical reasoning. Prof. Cowie explains, "The datasets generated are much larger than we have seen before and bigger than individual clinicians may develop over a lifetime of experience, so while there is excitement, some caution is warranted. Artificial intelligence based on big datasets is being used in online symptom checkers and we need to establish if these tools are accurate and reliable. Many companies are moving into this space and we need to understand where the clinician fits in and how we should advise patients about these services. But potential benefits include improved access to high-level medical advice, which may be particularly pertinent for patients living in remote rural places."

Many aspects of cardiology rely on imaging and there are also concerns that increasing automation may lead to job losses, but Prof. Cowie sees a positive side, "In reality, the amount of routine work may be reduced

allowing healthcare professionals to spend more time focusing on patients that require more clinical expertise. There is a lot of hype, and talk about the potential for harm, but mostly, there is hope that we will be able to use new techniques as 'digital support', rather than them being 'digital disruption', and they may actually increase the impact of humans working in healthcare."

Today's joint session with the International Society for Cardiovascular Translational Research will discuss these topics, from concept to clinical practice. A symposium tomorrow also aims to provide answers to some of the difficult questions relating to new data sciences.

Don't miss!

- **The digital revolution in cardiology: Joint session with the International Society for Cardiovascular Translational Research**
Today, 11:00 - 12:30; Balzac - The Hub
- **Big data in cardiovascular medicine: hope or hype?**
Tuesday, 08:30 - 10:00; Digital Health Stage 1 - Digital Health Area



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High oxygen delivery offers no benefit in ACS

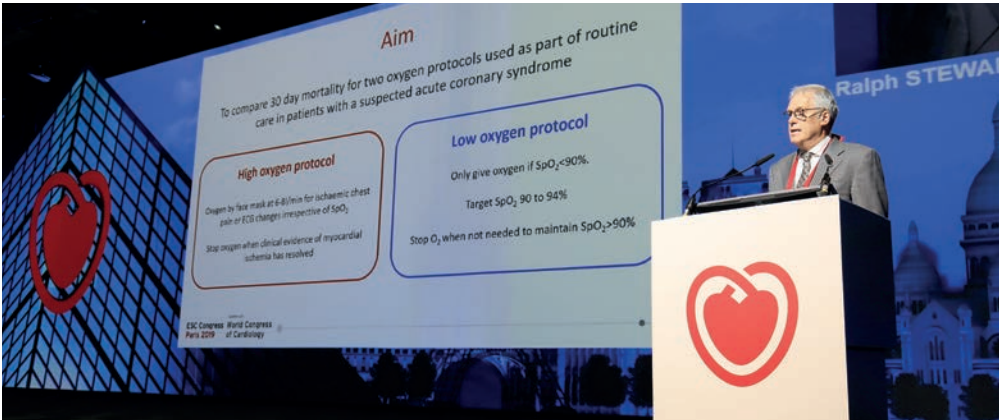
Oxygen has been widely used in acute coronary syndromes (ACS) but it is not certain if it does any good. Or, indeed, any harm. Yesterday, a Hot Line presentation from Professor Ralph Stewart (Auckland City Hospital, Auckland, New Zealand) reported results from the large NZOTACS study showing that a liberal oxygen strategy was no better or worse than a conservative oxygen strategy in terms of mortality.

“Given the size of New Zealand and its integrated healthcare system, we were able to conduct a country-wide, randomised, cross-over study comparing two oxygen-delivery protocols used as standard in the treatment of patients with suspected ACS,” explains Prof. Stewart. Around 40,000 patients with suspected ACS were identified from the All NZ Acute Coronary Syndromes Quality Improvement registry (ANZACS-QI) and the St John’s Ambulance ACS registry. A liberal strategy of high-flow oxygen (6-8 L/min) was recommended for suspected or confirmed ischaemic symptoms, whatever the oxygen saturation (SpO₂) level. According to the conservative protocol, oxygen was recommended only if SpO₂ was <90%. Over the two years of the study, each of the four New Zealand regions were randomised to either the liberal or the conservative strategy, with cross-over to the alternative strategy such that each strategy was administered for about one

year in each region. This resulted in a good match of baseline characteristics between the treatment groups.

“The data from this huge study showed that, at least overall, the oxygen-delivery strategy used did not make a difference to outcome in patients with ACS,” says Prof. Stewart.

At two years, the 30-day mortality was almost exactly the same with the liberal and the conservative oxygen-delivery protocols (3.0% vs 3.1%, odds ratio 0.96, 95% confidence interval 0.86-1.08). However, the results may have been influenced by a number of factors. According to Prof. Stewart, “Nearly 60% of the study population did not have a final diagnosis of ACS. In these patients, the mortality rate was a little under 2%, and any effect of oxygen was likely to be small. Another challenge was that adherence to the protocol was only around 80% overall. It was lower in the liberal compared with the conservative strategy group, probably because this was further away from guideline recommendations. Also, many patients did not receive oxygen because they did not have ischaemic symptoms at the time of assessment. Even though we had a very large study, these issues reduced its statistical power.”



However, the study did suggest that some groups of patients could benefit from the liberal oxygen strategy, although the numbers are too small to allow definite conclusions to be drawn. “There was a signal that patients with ST-elevation myocardial infarction, who had a mortality rate of around 10%, may do better with the higher oxygen delivery approach. Also, patients with SpO₂ <95%—not considered to be hypoxaemic according to current guidelines—had mortality rates about five-times those of patients with higher oxygen saturation, and a ~1% lower mortality rate with the liberal oxygen-delivery protocol.”

Whether oxygen-delivery strategies will be investigated in more depth will depend on the importance placed on possible small effects on mortality. “In my opinion,” says Prof. Stewart, “even a small benefit or harm

from oxygen is clinically relevant. I think the possibility of benefit from oxygen in patients with mild decreases in oxygen saturation levels should be studied further, maybe with an international collaboration because of the large numbers needed.”

In addition to the insights the study provided about oxygen-delivery strategies, Prof. Stewart thinks it has some messages for research as a whole. “Our study shows that randomised studies conducted as a part of healthcare delivery, despite some limitations, have great potential to identify which treatments benefit patients, as well as those which don’t.”

Don’t miss!

- **Meet the Trialist - NZOTACS**
Today, 10:00 - 10:30; ESC TV Stage - ESC Plaza

Cardiac rehabilitation: Relevant but undervalued



Prof. Paul Dendale

With the emergence of new and effective secondary prevention pharmacological agents, is there still a place for cardiac rehabilitation?

Professor Paul Dendale (Jessa Hospital, Hasselt, Belgium), President of the European Association of Preventive Cardiology (EAPC) and speaker at yesterday’s session ‘Is cardiac rehabilitation still a must in the 21st century?’, thinks there most definitely is. “Meta-analyses have shown that rehabilitation can produce similar reductions in morbidity and mortality as achieved with classical drug treatment, such as aspirin and statins. Rehabilitation programmes also teach patients how to adopt a new way of life, which is important given that about 80% of all cardiovascular disease is related to unhealthy lifestyles. So a combination of cardiac rehabilitation and pharmacotherapy is the best way to reduce the risk of recurrent events.” Despite the evidence in favour of cardiac rehabilitation, it remains a much-neglected approach.

“Only 20-50% of patients eligible for cardiac rehabilitation programmes are referred for them.”

“If we saw such a low level of prescribing for secondary prevention drugs, there would

be an outcry,” says Prof. Dendale. “One of the problems is that the evidence relies on meta-analyses rather than large randomised trials. Another issue is that the level of reimbursement varies between countries, with some offering no reimbursement at all. Policy changes are needed if patient access to cardiac rehabilitation programmes is to be increased.”

In addition, the long-term benefits of cardiac rehabilitation may be reduced by a lack of adherence. “In the initial stages after an event, patient adherence to classical programme recommendations is good, but in time, many revert to their original, unhealthy lifestyles. This suggests that the standard programme approach needs to be improved.”

Prof. Dendale’s group conducted a study involving a classical 3-month programme with or without an additional 6-month internet-based, patient-tailored telerehabilitation programme.² “Compared with the classical programme, the telerehabilitation programme led to larger improvements in fitness and in health-related quality of life. These types of programmes may also have greater cost-effectiveness.” He concludes, “Mobile health may be one way of making cardiac rehabilitation programmes both more effective and more widely available.”

1. Oldridge N, et al. Future Cardiol 2019;15:227-249.
2. Frederix I, et al. Eur J Prev Cardiol 2017;24:1708-1717.

Don’t miss!

- **Cardiac rehabilitation: is mobile health the way to go?**
Today, 08:30 - 10:00; Digital Health Stage 1 - Digital Health Area

Leading from the top to combat burnout



Dr. Stéphane Manzo-Silberman

A recent survey suggests that over half of all cardiology physicians are suffering from burnout¹ and the rate is increasing; hence, urgent measures are needed to stop this epidemic from spreading.

“We take care of others, but often do not take enough care of ourselves,” says Doctor Stéphane Manzo-Silberman (Hôpital Lariboisière, Université Paris VII, Paris, France). She thinks the main factors related to burnout are individuals’ characteristics, (limited) access to support networks and workload. “In younger healthcare professionals, with fewer career responsibilities, personal factors, such as personality and/or family and social support may play a large part in predicting burnout. In those who have progressed up the career ladder, risk factors become more work-burden related as individuals try to juggle clinical practice, additional administrative work and increased research opportunities, often with an imbalance between objectives and resources.” Technology, which may be expected to help reduce burnout, is a double-edged sword. “Reasonable use of technology, such as telemedicine, can help to improve organisational aspects and to reduce workload. However, other

technologies such as smartphones mean that healthcare professionals are always connected—and expected to be connected—and there are fewer opportunities to take time away from work.”

“If we are going to tackle burnout effectively,” says Dr. Manzo-Silberman, “we first have to recognise the extent of the problem and realise that everyone is at risk. Secondly, we need to rediscover the human factor, the kindness between colleagues that is disappearing in our fast-paced, competitive world.”

Leaders must lead by example.

“Leaders can raise awareness of burnout by discussing the issues with their team, organising departmental talks so individuals know how to recognise the signs, and encouraging people to share experiences. Leaders must also understand the highly pressurised environments their teams are working in and make conscious efforts to acknowledge the work of all members and promote support among colleagues. They should not close their eyes to bullying or unfair treatment and should make it clear that such behaviour will not be tolerated. Leaders must look at themselves, at their own style of leadership, to make sure they are helping their team and are not, perhaps unknowingly, being part of the problem themselves.”

1. Peckham C. Medscape cardiologist lifestyle report 2017; Race, ethnicity, bias and burnout.

Don’t miss!

- **It starts at the top - Leadership and clinician wellness**
Today, 14:30 - 15:40; Centre Stage - The Hub

Treating the elderly patient

– first, do no harm



Dr. Pascal de Groote

Treatment for heart failure is not straightforward for any patient. Add in up to seven comorbidities and possible cognitive impairment and nutritional problems, and you get an idea of the complexity of treating older patients. Doctor Pascal de Groote (CHU de Lille – Institut Coeur Poumon, Lille, France), a speaker at Saturday’s symposium ‘Very old patient, very new problems’ talks about the challenges of treating the elderly, which, in today’s world, means patients over the age of 80 years.

“Before any treatment is administered, a geriatric assessment must be conducted alongside the medical evaluation so that the patient’s frailty can be judged. The results of this assessment will guide management strategies and so it is an absolute necessity for all patients. The test should include evaluation of cognitive impairment, of depression, of mobility and should identify any financial, nutritional

or social problems that may influence management. Sometimes, we need the help of geriatricians for the geriatric evaluation.

In terms of treatment, elderly patients in good health can receive drugs and/or devices. Unfortunately, given the lack of randomised trials in elderly patients, we have to rely on registry evidence regarding which drugs used in younger patients will have similar efficacy in older individuals. The most important message to remember when treating this age group is to do no harm.

It is vitally important that we balance the efficacy of a treatment with the possible consequences of side effects, which, in older patients can be life threatening.

For example, we need to avoid exposing older patients to the risks of worsening renal failure with angiotensin-converting enzyme inhibitors, dehydration with diuretics and potentially devastating falls associated with orthostatic hypotension as a result of excessive blood pressure reduction. Unlike heart failure with reduced ejection fraction, for which there are established treatment

pathways, there is still no clear picture of the best drugs to use for heart failure with preserved ejection fraction, in younger as well as older patients. For these individuals, treatment should focus on managing symptoms.

When a patient is not in good health, treatment should be kept to a minimum and there should be a conversation with the patient and family about possible palliative care. As a note of caution here, although the medical community understand that ‘palliative care’ can last for months or even years, the term can be alarming for the general population, who associate it with imminent death. We need to be aware of this in our interactions with patients and care givers. The cardiologist and palliative care physician should work together to provide a management plan that will enable the patient to enjoy their remaining time without pain or distress.

Primary prevention is an important aim for all individuals, including the elderly, but we need to be realistic in our recommendations and mindful of the risks. With any age group, blood pressure, cholesterol, weight and diabetes should be managed, and individuals should be strongly advised not to smoke. All but the frailest older individual should be encouraged to do some sort of exercise every day. But this is a good example of

where we need to be careful. Walking outside is not suitable if the conditions may cause the person to fall. These sorts of nuances must be clearly explained. Ideally, prevention plans should be tailored to the individual.

The elderly patient deserves to be treated as well as patients of other ages. If we know their frailty status and are aware of the risks associated with different treatment approaches, we should be able to effectively manage elderly patients and ensure they enjoy a good quality of life.”

Don’t miss!

- **Would you give it to your grandmother?**
- **Primary prevention in the elderly**
Tuesday, 08:30 – 10:00; London
- Village 2

Pick of the posters today:

- Impact of frailty status on 30-day mortality in patients with valvular heart disease undergoing percutaneous transcatheter valve interventions (P3723)
08:30 – 12:30; Poster Area
- Older patients with atrial fibrillation and comorbidities are less likely to be treated with oral anticoagulation: insights from a nationwide study (P4774)
14:00 – 18:00; Poster Area

Empowering patients to reduce AF hospitalisations – the HELP-AF trial

Educating patients with atrial fibrillation (AF) about their disease can dramatically reduce unplanned hospitalisations, according to a Late-Breaking Science presentation yesterday by Professor Prashanthan Sanders (Centre for Heart Rhythm Disorders, University of Adelaide, Adelaide, SA, Australia) (Abstract 1365).

There has been an exponential increase in hospitalisations for AF in Australia, with an estimated increase of 295% over the last two decades.¹ According to Prof. Sanders, “AF is now the number one cause of cardiovascular hospitalisation in Australia and in terms of healthcare expenditure, it is a major burden.”

Looking for ways to reduce hospitalisation rates, Prof. Sanders and his team turned to the needs of patients to actively involve them in their own care. “If a patient doesn’t understand their disease and how to manage it, how can we expect them to adhere to their treatment regimen and avoid presenting to hospital? So, we designed a Home-Based Education and Learning Program for Patients with Atrial Fibrillation (HELP-AF) and studied the impact of education and empowering patients to self-manage their condition. The ‘home-

based’ element of HELP-AF is important—the patient learns best if they are empowered in the safety of their home and so we chose home delivery, rather than bringing them to the clinic, to allow them to readily absorb the information in their own environment.”

The programme itself comprised two structured educational visits (SEV) from a nurse or pharmacist in which four key messages relating to the management of AF were presented in a way that was tailored to each individual’s needs. Developed by a multidisciplinary team and with patient input, the four key messages were: 1) The importance of adhering to medications to manage AF; 2) The role of stroke-preventing medications in reducing the risk of stroke; 3) Reducing the risk of AF becoming more severe and the risk of stroke with good lifestyle management; and 4) Recognising that most episodes of AF with usual symptoms are not medical emergencies and can be managed with the use of a personalised action plan. The home-based education was supported by a booklet that summarised the key messages and which the patient kept for future reference.

Altogether, 627 patients were randomised 1:1 to HELP-AF or standard of care (SoC) and followed-up for two years. The co-primary endpoint was a blinded assessment

of total unplanned hospitalisations, and health-related quality of life (QoL) assessed using the general Short Form-36 (SF-36) and the AF-specific AF-Effect on Quality of Life (AFEQT) questionnaires. All patients included had data for hospitalisations and 90% had data for QoL. Baseline characteristics were similar.

HELP-AF significantly reduced total unplanned hospitalisations by 26% (incident rate ratio [IRR] 0.74; 95% confidence interval [CI] 0.62-0.89; p=0.001) vs SoC.

“There were also significant reductions of 31% in AF-related unplanned hospitalisations (IRR 0.69; 95% CI 0.51-0.94; p=0.01) and of 49% in other unplanned cardiac hospitalisations (IRR 0.51; 95% CI 0.34-0.75; p=0.001) with HELP-AF vs SoC. However, there was no impact of HELP-AF on unplanned non-cardiac hospitalisations (IRR 0.97; 95% CI 0.74-1.26; p=0.8), which suggests that the reduction in total unplanned hospitalisations is driven by a broader impact on cardiovascular risk,” says Prof. Sanders. There was no difference between the treatment arms in QoL



assessed by SF-36, although some elements of the AF-specific questionnaire were improved with the intervention.

“A simple home-based personalised structured education programme can significantly reduce hospitalisations, thereby improving the health of patients with AF and decreasing the use of healthcare resources,” concludes Prof. Sanders. As a next step, the team will be combining patient education and self-management with care delivery by a multidisciplinary team in the iCARE-AF (integrated care in AF) trial, which is due to start imminently.

1. Gallagher C, et al. Heart 2019;105:1358-1363.

Replay the video and slides on ESC 365: www.escardio.org/365

How can we better care for neglected cardiovascular diseases?

Affecting over 33 million people globally, rheumatic heart disease accounted for over 300,000 deaths worldwide in 2015, higher death rates being seen in poorer regions, including Oceania, South Asia and central sub-Saharan Africa.¹

According to President of the World Heart Federation (WHF), Professor Karen Sliwa (University of Cape Town, Cape Town, South Africa), “Rheumatic fever and rheumatic heart disease remain significant causes of cardiovascular disease in the world today, despite being easily preventable, and this constitutes a serious public health problem in many low-resource settings and among indigenous populations. Rheumatic heart disease occurs most commonly in children, adolescents and younger adults and can have devastating effects on patients and their families, including life-long disability and death.” She continues, “We need to make rheumatic heart disease a global health priority, helping countries to integrate it into their national plans by providing penicillin as primary and secondary prevention and improving care, including having access to cardiothoracic surgery. This will support the implementation of the WHO 2018 Global Resolution on rheumatic fever and rheumatic heart disease.”²

Recognising the urgent need to address the health and economic burden of neglected cardiovascular diseases and to bring much-needed attention to this global crisis, the ESC Congress-World Congress of Cardiology partnership has made these conditions the focus of a number of different symposia and sessions.

Today, delegates will learn more about challenges and opportunities in managing rheumatic heart disease in a case-based, interactive session, and also have the opportunity to hear results from international studies in a moderated poster session. Highlights will include a 3-4-year follow-up of a multicentre, respective cohort study of children with subclinical rheumatic heart disease over five countries (Abstract P3131) and a pilot screening programme from Bornean Malaysia that is using portable echocardiography to improve early detection (Abstract P3129). Rheumatic heart disease will also be featured in a Global Exchange event, ‘Reducing the burden of cardiovascular disease in Africa,’ this afternoon, held jointly with the Pan-African Society of Cardiology and the African Heart Network.

Also treatable is Chagas disease, or American trypanosomiasis, which affects 6-7 million people around the world.³ “When untreated,” says Prof. Sliwa, “Chagas disease can cause

serious heart and digestive system problems and around 12,000 people die each year from disease-related causes. Yet only around 1 in 10 are diagnosed and fewer than 1% receive treatment.” Chagas disease, like other neglected diseases, has gone largely unnoticed by society and policy makers, despite being one of the most prevalent public health problems in Latin America.

“The increasing movement of people around the world means that Chagas disease is now on the rise in Europe and North America.”

“Renewed efforts must be made to combat Chagas disease, which often affects the poorest and most marginalised,” says Prof. Sliwa. “The WHF has also recently joined the Chagas Coalition. This is an ambitious, collaborative alliance of civil society organisations, including patient groups, that works to eradicate Chagas disease by sharing experiences and knowledge and translating this into concerted actions.”

Chagas disease, along with rheumatic heart disease, were discussed in a symposium yesterday, ‘New hope for neglected cardiovascular diseases’, held jointly with the Brazilian Society of Cardiology. It will

also receive much attention at a Global Exchange event this morning, ‘Reducing the burden of cardiovascular disease in the Americas’, held jointly with the Inter-American Society of Cardiology (SIAC) and the Inter-American Heart Foundation, where the WHF and SIAC will launch a new Global Roadmap project.

- 1. Watkins DA, et al. N Engl J Med 2017;377:713-722.
- 2. WHO report. <https://www.who.int/ncds/management/rheumatic-heart-disease-resolution/en/>
- 3. WHO fact sheet. [https://www.who.int/en/news-room/fact-sheets/detail/chagas-disease-\(american-trypanosomiasis\)](https://www.who.int/en/news-room/fact-sheets/detail/chagas-disease-(american-trypanosomiasis))

Don’t miss today!

- **Challenges and opportunities in managing rheumatic heart disease**
08:30 - 10:00; Zagreb - Village 6
- **Reducing the burden of cardiovascular disease in the Americas**
09:00 - 10:30; Global Exchange 2 - ESC Plaza
- **Global perspective on rheumatic heart disease**
10:05 - 10:55; Moderated ePoster 6 - Poster Area
- **Reducing the burden of cardiovascular disease in Asia Pacific**
11:00 - 12:30; Global Exchange 2 - ESC Plaza
- **Reducing the burden of cardiovascular disease in Africa**
14:00 - 15:30; Global Exchange 2 - ESC Plaza

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Don't forget

Satellite Symposium
Experts on the Spot

Combinations of beta-blockers and ACE inhibitors: what is the rationale?

Chairperson: **C. Tsioufis** (Greece)
Speakers: **C. Maack** (Germany), **J. Wolf** (Poland)

Monday, September 2, 2019, **10:15-10:45**
Camus – The Hub

Monday, September 2, 2019

13:00-14:00

Sarajevo – Village 5

Satellite Symposium

Angina as a multifactorial clinical entity: broadening our therapeutic horizons

Chairpersons:

W. Boden (US)
L. H. W. Gowdak (Brazil)

Speakers:

W. Boden (US)
L. H. W. Gowdak (Brazil)
L. De Luca (Italy)



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