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CARDIOPULSE

# A focused update to the ESC Guidelines for the management of patients with atrial fibrillation

## The first ESC Guideline on atrial fibrillation (AF) was published in 2010. Just 2 years later, a focused update is necessary because of the volume of research in this arena

'A focused update to the European Society of Cardiology (ESC) Guidelines for the management of patients with atrial fibrillation' was presented at the ESC Congress by Task Force chair Prof. John Camm (UK) and published online on 26 August 2012 in *European Heart Journal* and *EP-Europace*. The new recommendations will also be incorporated into the 2010 version of 'Pocket Guidelines'.

The update concentrates on a few areas which are most critical in the clinical environment. The first relates to the strengthening of evidence for the identification of patients at risk for thrombo-embolic events related to AF. Many large data sets have been examined between 2010 and 2012 that confirm the validity of the scoring system $CHA_2DS_2$-VASc, and the Guidelines therefore reinforce the use of this stratification scheme. They also support the use of HAS-BLED for scoring the bleeding risk in patients who require anticoagulation for stroke prevention in AF.

**John Camm**

'With the advent of potentially safer oral anticoagulants, it is sensible to try and improve the recognition and stratification of patients with AF so that a greater proportion is appropriately anticoagulated', says Prof. Camm. For this reason the Guideline first states that unless you are under 65 years of age and have no history of cardiovascular ill health, you should be considered for anticoagulation.

Two new anticoagulation drugs—dabigatran and rivaroxaban—have been approved and it is anticipated that a third, apixaban, will be approved within the next 3–6 months. Comments in the update refer specifically to dabigatran and rivaroxaban, but can be extrapolated to apixaban, pending its approval.

These agents are preferred (but with a cautious Class IIa recommendation) to dose-adjusted warfarin for the management of AF patients at a risk of stroke except in a number of settings where they have not yet been evaluated. First, valvular AF, which includes rheumatic heart disease with valve involvement or the presence of prosthetic heart valves. The second setting is during, or for, treatment that already involves two antiplatelet agents such as aspirin and clopidogrel—for example in patients with acute coronary syndrome or following stent implantation. There are also numerous small categories of patients for whom the new anticoagulants are not yet indicated because their investigation is incomplete.

An important element of the revised guideline is that aspirin monotherapy is no longer recommended for the prevention of strokes in patients with a low thrombo-embolic risk score, using $CHA_2DS_2$-VASc for example. But there is no statement to say that aspirin is not recommended. Camm explains: 'We realised that some patients will find some security in taking it. We think it is misplaced, but nonetheless we did not want to write a recommendation saying do not use aspirin'.

Also related to anticoagulation, the Task Force has for the first time introduced a guideline which applies to the occlusion of the left atrial appendage. The majority of thrombi form in this sac and inserting a device percutaneously to occlude it can theoretically prevent the development of a large proportion of thrombi. This recommendation is a Class IIb, level of evidence B. 'There is only one fully randomised trial that supports it but it shows that it is at least as good as warfarin', says Camm. 'It is recommended for patients who have high bleeding risks and therefore cannot take warfarin or any other anticoagulant and yet have a high risk of stroke'. A similar recommendation—but at Class IIb, level of evidence C—is given for surgical closure of the left atrial appendage.

The document then moves to vernakalant, a new anti-arrhythmic agent approved since the last Guidelines. Vernakalant was specifically designed and developed for the conversion of AF to sinus rhythm by i.v. infusion of the drug. It is recommended in

patients with minimal to moderate heart disease, with some exceptions, and it is placed ahead of using amiodarone. It can also be used for restoration of sinus rhythm in patients with early AF after cardio-thoracic surgery where the choice of drugs for cardioversion is limited either due to the pro-arrhythmic effects or delayed onset of action. One of the advantages of vernakalant is its rapid effect—often within minutes after the start of treatment.

Two changes are made in the area of oral anti-arrhythmic therapy. First, the notion of short-term therapy following cardioversion is introduced. This is a 4-week course of anti-arrhythmic drugs to prevent immediate recurrence of the arrhythmia, after which the anti-arrhythmic drug is no longer used. This approach reduces the likelihood of recurrence by 80% of the amount achieved by continuing to use the anti-arrhythmic drug, but without the potential adverse events from prolonged use of the drug. This recommendation applies specifically to flecainide and probably to propafenone.

There have been two major developments with dronedarone since the 2010 Guidelines. Dronedarone is associated with hepatotoxicity and therefore there is a need for regular monitoring of the drug using hepatic function testing. This is mentioned in the text but not given a specific recommendation.

A trial of dronedarone in patients with permanent AF was stopped prematurely because of adverse events. Some of this adverse event profile can be extrapolated to patients with recurrent AF. Dronedarone is given a Class III recommendation, which means it is contraindicated in permanent AF, although it can still be used in paroxysmal or persistent AF, particularly to reduce cardiovascular hospitalizations. The Task Force also strengthened its advice against using dronedarone in patients with heart failure.

Catheter ablation, specifically left atrial ablation for AF, is another area that was updated. The Task Force upgraded a recommendation for the ablation of paroxysmal AF which is refractory to drug therapy to a Class I, provided that both the operator and centre are experienced in the technique. They also upgraded a recommendation—from Class IIb to IIa—supporting the use of catheter ablation for paroxysmal AF as first-line therapy, i.e. without the need to initially explore the use of anti-arrhythmic drugs.

The Task Force faced a number of challenges. One was how the Task Force should interpret advice given by European regulators, particularly when that advice conflicts with advice from other regulators such as the US FDA. One dilemma was what to say about the role of dronedarone in heart failure when the European regulator has banned its use in heart failure and the US FDA has not. Camm says: 'We have largely banned it but left it possible to use dronedarone, if no other therapy exists, for patients with mild heart failure'.

A second example is where the specific indications for the new anticoagulant drugs differ to some extent from regulatory documents, whereas in the clinic they should probably all share the same indications. 'To a large extent, we have made no distinction between the precise indications for the new anticoagulants', says Camm.

An additional challenge was how to guide the use of drugs that have very positive clinical trial results and have been approved by the regulator but for which the clinical experience is still quite sparse. Camm says: 'If the drug is ''on-sale'' a guideline is needed, but the guideline must also express some caution. Interestingly, on the other hand, there is little or no mechanism by which cautious guidelines can be ''upgraded'' without more clinical trial data, which in most cases will not happen'.

As a final comment Camm adds: 'We already know that many more clinical trials concerning the management of patients with AF are now underway, and I have no doubt that a future revision to this Guideline will be needed soon'.

*Jennifer Taylor*

# Gold standards of success defined for atrial fibrillation ablation

## Comments from the update on consensus statement for managing AF issued at the ESC Congress 2012

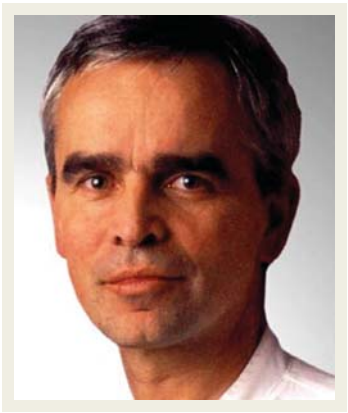
Gold standards of success for catheter and surgical ablation of atrial fibrillation (AF) have been set out in an international consensus statement[1].

The 2012 expert consensus statement on catheter and surgical ablation of AF was developed by the Heart Rhythm Society (HRS), the European Heart Rhythm Association (EHRA), a registered branch of the European Society of Cardiology (ESC), and the European Cardiac Arrhythmia Society (ECAS) and published in their respective journals: *Heart Rhythm*, *EP Europace*,[1] and the *Journal of Interventional Cardiovascular Electrophysiology* (JICE).

Since the previous consensus document published in 2007, catheter and surgical ablation of AF have become standard treatments and more randomized trials of ablation vs. optimal drug therapy for AF have been conducted. 'Significantly more data exist on techniques, success rates and complications of these new interventions, making this a more valid document compared to 2007,' said Prof. Karl Heinz Kuck (Germany), president-elect of EHRA, and co-chair of the task force that developed the document.

He added: 'Data from randomised trials clearly indicate that catheter ablation is superior to any drug treatment for recurrences of atrial fibrillation and quality of life. But the long term outcome is not as good as was thought in 2007.'

Newly analysed data on the long-term outcome after successful ablation of longstanding persistent AF shows that just 40–50% of patients remain free of recurrent AF after 5 years.



**Karl H. Kuck**

The increase volume of data enabled the authors to calculate minimum acceptable success rates for the different types of AF for the first time. Success was defined as freedom from AF, atrial flutter and atrial tachycardia and no anti-arrhythmic drug therapy. At 12 months following the ablation procedure, the minimum acceptable success rates are 50% for paroxysmal AF, 40% for persistent AF and 30% for longstanding persistent AF.

Also for the first time, the authors state that the maximum overall complication rate should be in the region of 4.5%. 'For an invasive procedure you want to know how successful it is but you also want to know how risky it is', said Prof. Kuck.

Standards are clearly set out for the design of clinical trials. The minimum set of data that should be published is outlined, along with the endpoints and definitions that should be used. Prof. Kuck said: 'This should increase standardization of trials and enable researchers, patients and organisations to compare success and complication rates more easily.'

Another new feature in the 2012 document is a recommendation to perform catheter ablation in patients with paroxysmal AF and no or minimal underlying heart disease as a first-line treatment. Previous recommendations said these patients should first receive an anti-arrhythmic drug and only proceed to catheter ablation if the drug failed. Prof. Kuck said: 'Patients with paroxysmal AF can now receive the primary treatment option straightaway, without any delay'.

He concluded: 'This comprehensive state of the art review of the field of catheter and surgical ablation of atrial fibrillation sets out standards for success rates, complication rates and clinical trial design. This will help patients, doctors, researchers and organisations to see which doctors and institutions are up to scratch and where improvements are needed'.

'Forty-five experts from around the world representing seven different organizations have come together to develop a consensus for successful catheter and surgical ablation of atrial fibrillation. It is our hope that this guidance will help to ensure that patients seeking treatment will receive high quality care regardless of where they live and also bring us one step closer to ending pain and suffering due to heart rhythm disorders,' noted Anne M. Gillis, MD, FHRS, president of Heart Rhythm Society.

*A. Tofield*

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# Percutaneous radiofrequency catheter ablation of atrial fibrillation

## Dr Laurent Haegeli briefly reviews this latest treatment modality for AF

**Laurent Haegeli**

Atrial fibrillation (AF) is the most common cardiac arrhythmia and its incidence and prevalence are currently on the rise. Atrial fibrillation results in substantial morbidity and mortality from stroke, thrombo-embolism and heart failure, and causes a significant impairment of the quality of life. The prevalence of AF markedly rises with increasing age. The number of affected individuals is expected to double or triple within the next two decades due to a rise in AF incidence and ageing of the Western populations, thus making AF an even more important public health concern in the future.

Percutaneous radiofrequency catheter ablation has emerged as an effective treatment for recurrent symptomatic AF after failed anti-arrhythmic drug therapy. Ablation techniques have improved and the complication rate has decreased. As a result, referrals of patients for catheter ablation of AF have increased considerably in recent years.

The catheter ablation technique for AF was developed over a decade ago on the basis of the pathophysiology that focal sources of ectopic beats arising from the pulmonary veins often initiate

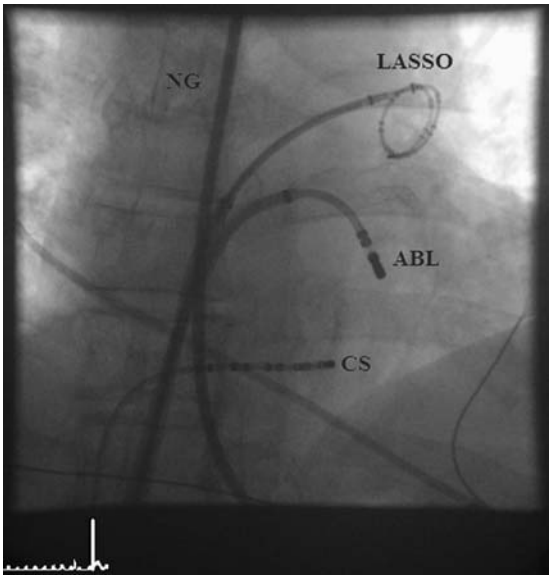


**Figure 1** Fluoroscopy image in the left anterior oblique view. The ablation catheter is inserted into the left atrium and the circular mapping catheter is positioned at the ostium of the left superior pulmonary vein after successful double trans-septal puncture of the interatrial septum. The oesophageal position is monitored using a contrast dye-filled nasogastric tube. ABL, ablation catheter; LASSO, circular mapping catheter; CS, coronary sinus catheter; NG, nasogastric tube.

AF. Since then, ablation strategies have been employed in the daily practice of AF patient management. Current ablation strategies involve anatomical circumferential electrical ablation around the orifices of the pulmonary veins, with the aim to electrically isolate the pulmonary veins from the left atrium—the cornerstone of AF ablation.

Ablation therapy has been shown to be superior to anti-arrhythmic drug therapy in several prospective randomized clinical trials. The success rates are approaching 70–90% in experienced ablation centres, with complication rates of up to 3% (cardiac tamponade and cerebral embolism). Catheter ablation for chronic AF is less successful than for paroxysmal AF and demands longer procedure times and often repeat procedures due to pulmonary vein re-conduction or occurrence of post-ablation arrhythmia (atrial re-entrant tachycardia due to incomplete ablation lines).

At the beginning of the procedure, three femoral vein sheaths are inserted under local anaesthesia into the right femoral vein. A steerable decapolar electrophysiology catheter is placed into the coronary sinus. After double trans-septal puncture performed by a trans-septal needle, a circular decapolar or 20-polar mapping catheter and an irrigated-tip ablation catheter are passed trans-septally through two trans-septal guiding introducers. The catheter ablation is performed using radiofrequency energy for sequential, 'point-by-point" lesion creation under three-dimensional electro-anatomical mapping system guidance. The ablation strategy consists of continuous wide-area circumferential lines around both ipsilateral pulmonary veins (*Figure 1* and *2*). Lesions are delivered for up to 30 s, using radiofrequency energy up to 35 W. The endpoint of the circumferential ablation

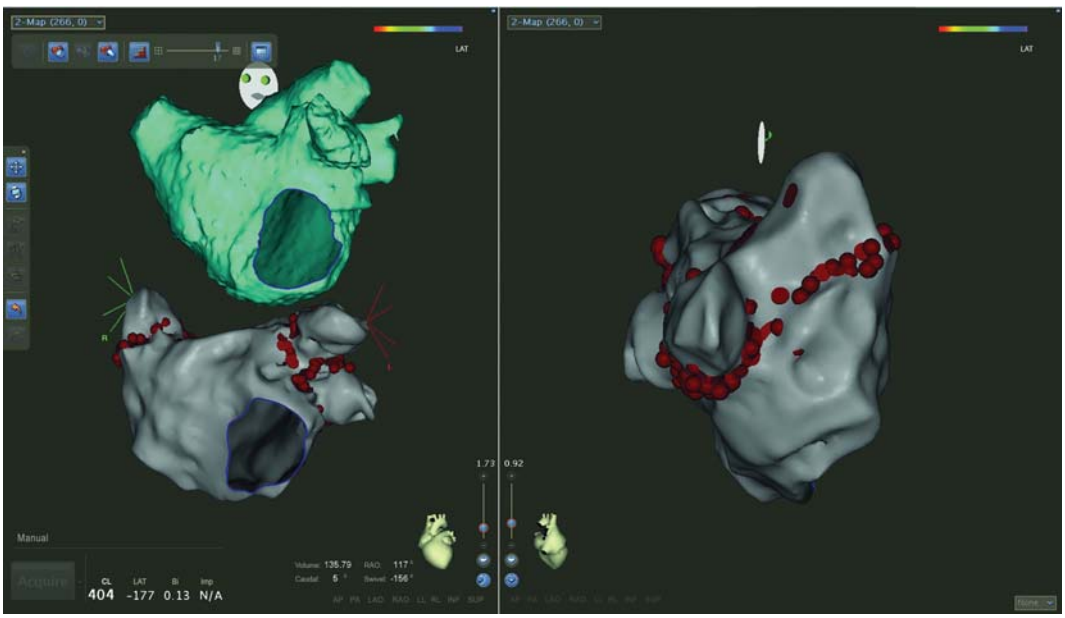


**Figure 2** In the panel on the left: three-dimensional electro-anatomical map (grey) of the left atrium in left anterior oblique projection with circumferential ablation (red points) around ipsilateral pulmonary veins using an electro-anatomical mapping system at the bottom (CARTO Biosense Webster Inc., Diamond Bar, CA, USA) and three-dimensional reconstruction of the computerized tomogram of the left atrium (green) on the top. In the panel on the right: three-dimensional electro-anatomical map (grey) of the left atrium in right lateral projection with circumferential ablation (red points).

is complete electrical isolation of all pulmonary veins, which is assessed using the circular mapping catheter placed at the pulmonary vein opening.

*Laurent M. Haegeli* MD, Consultant Cardiologist, Arrhythmia Unit, Zurich University Hospital

# New clinical cardiopulmonary exercise testing joint statement from the European Society of Cardiology and American Heart Association

## A new exercise testing procedure for unexplained exertional dyspnoea is discussed by Marco Guazzi and Ross Arena

**Marco Guazzi**

**Ross Arena**

Cardiopulmonary exercise testing (CPX) merges traditional exercise testing procedures (ECG, blood pressure, perceived exertion, etc.) with ventilatory expired gas analysis (i.e. oxygen consumption, carbon dioxide production, and minute ventilation)[1]. The combination of these variables enables the assessment of an individual's response to physical exertion in a highly refined manner. Thus, CPX is highly valuable when unexplained exertional limitations are present, as this assessment technique can help to isolate physiological abnormalities in the cardiovascular, pulmonary and/or skeletal muscle systems. Moreover, a number of CPX variables have proved to be highly prognostic in a number of patient populations. Currently, CPX is a clinical standard of care in patients with unexplained exertional dyspnoea as well as those diagnosed with heart failure. Additionally, emerging evidence strongly suggests that CPX has clinical application in patients with suspected/confirmed pulmonary arterial hypertension or secondary pulmonary hypertension, pulmonary disease, hypertrophic cardiomyopathy, suspected myocardial ischaemia, and suspected mitochondrial myopathy. It is therefore likely that the clinical application of CPX will expand in the coming years.

Although original research demonstrating the value of CPX is robust and numerous review papers as well as scientific statements have been written on the topic, actual clinical use of this exercise assessment remains suboptimal. A potential reason for lower utilization of CPX in clinically warranted situations is an inability for clinicians to easily identify and interpret the most relevant data. In truth, most software packages operating CPX systems generate reports and graphs that are oftentimes difficult for the clinician to decipher. Moreover, a number of variables included in these reports do not provide essential, evidence-based, clinical information for a given test indication. Appropriate clinical utilization of CPX may increase if a simplified approach to key data identification and interpretation was available.

The new clinical CPX statement, which was a joint effort from the European Society of Cardiology and American Heart Association, recently published in both the *European Heart Journal* and *Circulation* (September epub ahead of print), Guazzi *et al.*[2] provides a streamlined approach to key data identification and interpretation. The body of original research in CPX is reviewed and used to justify which variables should be assessed *for a given test indication*. While certain variables overlap and are universal to all test indications, others are unique to the reason for CPX. From this review of evidence, simplified, colour-coded, one page reporting sheets are provided for the following test indications: (i) heart failure, (ii) suspected or confirmed hypertrophic cardiomyopathy, (iii) unexplained exertional dyspnoea, (iv) suspected or confirmed pulmonary arterial hypertension/secondary pulmonary hypertension, (v) chronic obstructive lung disease or interstitial lung disease, (vi) suspected myocardial ischaemia and (vii) suspected mitochondrial myopathy. Based on the colour-coded value for

each pertinent CPX value obtained, an evidence-based prognostic and/or diagnostic interpretation is provided. We view this approach as a major step forwards in simplifying CPX interpretation with high clinical applicability.

In closing, based on the body of research in this area, CPX clearly provides highly valuable clinical information in a number of patient populations. As co-chairs of the writing group that developed this joint statement, it is our hope that clinicians whose patients would benefit from CPX find this document to be highly valuable in their practice.

*Marco Guazzi,* MD, PhD, FACC
*Ross Arena,* PhD, PT, FAHA

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# The cardiologists who helped to avoid a disaster at the London Olympics

**An academic understanding of 'athlete's heart' and a rigorous cardiac screening programme undertaken by many countries helped to avoid tragedy at the 2012 Olympic Games, according to sports cardiologist Prof. Sanjay Sharma, reports Barry Shurlock PhD**

**Sanjay Sharma**

Since 1990, 11 people have died while running the London Marathon, all but one of them men. The exception this year, only 3months before the British capital was due to host the Olympic Games, was a young woman, Claire Squires, running to raise money for the UK charity Samaritans (part of the international emotional support network, Befrienders Worldwide), who suffered a cardiac arrest less than a mile from the finish line. As well as being a personal tragedy [though, on the bright side, it did prompt the donation of more than a million pounds (€1.2 million) to charity], the death cast a large shadow over the event, and must have caused some unease in the minds of those responsible for the health of athletes soon to compete in the London Olympics. It also grimly confirmed the established gender risk in sudden cardiac death, generally regarded as 9–1 to the detriment of men.

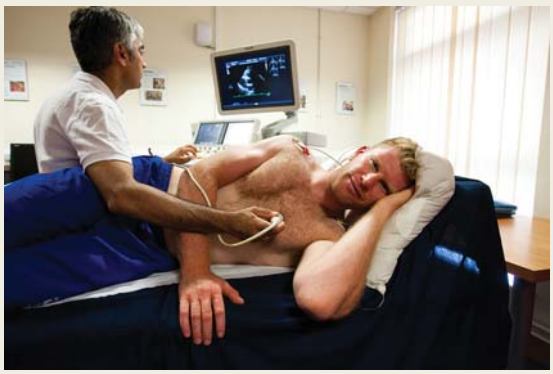
A key person in this setting is sports cardiologist Prof. Sanjay Sharma, MD, FRCP, FESC, who has a special interest in cardiovascular adaptation in athletes, is medical director of the London Marathon and was lead cardiologist for testing the British Olympic squad (Team GB).

Two years ago (February 2010) he was appointed to the Chair of Inherited Cardiac Diseases and Sports Cardiology, at St George's Healthcare NHS Trust, London, and he also acts as a consultant cardiologist for a number of organizations, including the English Institute of Sport, the British Rugby League, the British Lawn Tennis Association and Cardiac Risk in the Young (CRY), a British charity which offers screening to budding athletes.

He said: 'My main tasks at the Games were to look after athletes in the medical tent in 14 endurance events—including the marathon, triathlon, and the 25- and 50-km walks—and to offer a rota of 6 cardiologists at the polyclinics in the Olympic Village and other venues. There were no fatalities or [cardiac] catastrophes amongst the athletes, though there were 5 cardiac arrests in the spectators, with 1 death. Surprisingly, I was busiest with the Olympics officials [referred from the polyclinics], several of whom had chest pain'.

**GB medical team**

'Before the British competitors were even selected, my team, which consisted of 4 cardiac research fellows, screened all the 1022 athletes in the various training camps, of whom about 550 eventually made it into Team GB. We used CRY mobile vans, with ECG and echocardiograph equipment donated by Philips [Healthcare]. At one stage, out of the blue, we got a phone call from the Sky Cycling squad in Milan—who were of course spectacularly successful—and we flew out with all the equipment. The only people we didn't get our hands on were the equestrian athletes, though I think their horses *were* screened [by vets]! We found one support athlete, who had to be disqualified and undergo a major surgical procedure. Two others had electrophysiological conditions that took them out of sport for 6 weeks, but were cured completely by ablation. Two others had initial suspicions of disorders that could kill, but were cleared following comprehensive assessment. One athlete had an irregular heart that was treated with medication and went on to win gold in rowing'.



**Sanjay Sharma testing athlete**

'The International Olympic Committee recommends, but does not mandate, cardiac screening. In fact, the squads of several other countries were screened, including Italy, where it is mandatory. The sports for which it is most necessary include rowing—which is like weight-lifting with the feet and arms!—Canoeing, long-distance swimming, cycling—and the triathlon, long-distance walking and running, which are extremely gruelling events. During the Games we had to attend to a swimmer from an African country, who developed chest pains. Also a marathon runner who became breathless and had a loud murmur, and another in the triathlon who got a bronze medal, but the presentation had to be postponed for 40 minutes because he had collapsed with exhaustion afterwards'.

'In general, we had more business than expected. Our aim at the endurance events held outside the Olympic Stadium—in Hyde Park, The Mall and at Hampton Court—was to get any athletes with problems out of the media area and into the medical tents. We had long-distance runners who were exhausted, too hot, or dehydrated, and lots of athletes who were in floods of tears with the despair and sadness of dropping out or collapsing. Many had travelling doctors to attend them: we sometimes had a language barrier or differences of opinion, such as those who did not know that shivering can occur with heat shock. Problems of one sort or another were encountered by 8%, 12 and 20% of competitors in the triathlon, marathon and 50-km walk'.

There are few cardiologists who would have been better prepared for the challenge faced by Prof. Sharma when he was first asked to assist at the London Olympics. At the recent ESC Annual Congress (August 2012), he gave four presentations on sports cardiology and since 1996, when he worked with Prof. William J. McKenna at St George's, London, for an MD on an algorithm for the differential diagnosis of left-ventricular hypertrophy and hypertrophic cardiomyopathy in athletes, he has published >100 papers on this and related subjects. At a recently created CRY Inherited Cardiac Diseases and Sports Cardiology Centre at St George's, he holds four clinics a week and takes referrals from throughout the UK. In 2008 he was elected to the nucleus of the sports cardiology section of the European Association of Cardiovascular Disease Prevention and Rehabilitation, which operates under the aegis of the ESC, and is currently its chairman-elect.

Outlining some of the major findings of sports cardiology, many from his own research, he said: 'There is a considerable racial difference, with 2% of white athletes having a thickened left ventricle—defined as a wall thickness over 12 mm—compared to 18% amongst blacks. This is in athletes of West African ancestry in the UK, France, the USA and other Western countries. Together with the high proportion of fast-twitch fibres found in their arms and legs, a thickened left ventricle makes them very good in explosive sports, such as sprinting, though they fatigue quite easily. This is in contrast to athletes of East African ancestry, who have very large hearts but the walls are not so thick. We have not yet been able to study Africans in their home countries, but managed this time to test 15–20 Kenyans at their training camp in the UK and found that they had very big hearts—70% had a left-ventricular size exceeding 6 cm'.

Asked to comment on the potential cardiac risks of competing at the highest level in sport, Prof. Sharma said: 'Of course, we all know that modest exercise of 15–30 minutes a day is good—you may live an extra 7 years, be less likely to be obese and gain confidence etc. However, nobody knows whether gruelling exercise—with say a rate of 170 beats per minute over several hours—takes its toll on the heart, though there are some pointers. Biomarkers of cardiac muscle damage such as troponin C are elevated, but they normalise after 2 days and no-one knows if they indicate long-term damage. Also, data for long-distance cyclists in Belgium shows a higher death rate. What is certain is that atrial fibrillation has a high prevalence in long-distance runners of about 6% at age 50–60years, compared to 0.5% in the general population. With a million people a year now running marathons in Europe, and perhaps 2 million including the USA, we can expect an epidemic of AF in years to come'.

Commenting on those who in 4 years' time will be looking after the hearts of athletes at the Rio Olympics, he said: 'When you make plans you have to remember that there might be 2 billion people watching around the world and a cardiac death in any Olympic event is therefore an unmitigated disaster. We were surprised at how busy we were and although we obviously focused on the athletes, and the spectators on the day, I would say: "Don't forget the IOC officials, who are often quite elderly and not very fit!"'.

# ‘A Year in Cardiology’: 2012

## The British Cardiovascular Society announces its second annual symposium to be held in December 2012

‘A Year in Cardiology’ is an annual, one-day symposium, held at the end of the international conference calendar, which aims to provide a succinct update of the year’s most important developments in Cardiology. ‘A Year in Cardiology’ was developed by the British Cardiovascular Society as part of its education portfolio with the inaugural symposium in December 2011. It received universal acclaim.

Expert and authoritative speakers from the UK and Europe are invited to present a comprehensive review of the headline news for the year, which is shaping the rapidly changing landscape of cardiovascular medicine and the subspecialties.

The morning session focusses on ESC Guideline updates, pharmacological and technological advances, and covers important topics that may have missed the headline news. The afternoon session reviews key developments in all major cardiology subspecialties with an eye to significant developments and innovations on the horizon. Landmark trials are cross-referenced to the relevant conferences of the year and publications, allowing delegates to follow-up after the symposium. At the end of each session, there is an opportunity to ‘Ask the Expert’. Chaired by a renowned opinion leader, the presentations are challenged and questions and controversies debated with lively audience participation. A highlight this year is a keynote lecture given by Professor Roberto Ferrari, Past President of the European Society of Cardiology (ESC).

**Roberto Ferrari**

All presentations are reviewed in advance before the symposium. This attention to detail ensures that this one-day format provides the succinct information required by time-pressured physicians and cardiologists to stay abreast of key advances and opinions in Cardiology for their day-to-day clinical practice. For the purposes of reflective learning, delegates will have online access to the speakers’ presentations for future reference and, in addition, each presentation will be supplemented by five questions which will form part of an optional online formative assessment. For presentations in key areas of cardiology, the *European Heart Journal* has commissioned a series of Review articles which will be published from January 2013.

This years’ symposium will be held at the Royal College of Physicians, London, on Friday 14 December 2012. The symposium is accredited by EBAC (European Board for Accreditation in Cardiology) with delegates earning 6 CME (Continuing Medical Education) or CPD (Continuing Professional Development) points (also from the Royal College of Physicians, London) for attendance.

For details on ‘A Year in Cardiology-2012’ and other symposia run by the Division of Education and Research at the British Cardiovascular Society, see www.bcs.com/education/.

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