A rethink for ICDs in non-ischaemic HF
DANISH study’s neutral result

Remote ICD monitoring brings no added clinical benefit in HF

TWO CLINICAL trials exploring remote monitoring in HF patients fitted with cardiac implantable electronic devices reported in yesterday’s Hot Line session failed to detect improved clinical outcomes over conventional care - although one study did show reductions in office visits and costs.

Despite advances, HF patients remain at high risk of death and hospitalisation. There has thus been much interest in whether the remote transmission of ICD data prompts improved clinical outcomes.

The REM-HF trial randomised 1650 patients from nine English hospitals to usual care and weekly remote monitoring or to usual care alone. The study, which was published simultaneously in JAMA, is the largest trial ever of remote monitoring.

Results at a median follow-up of 2.8 years showed that the primary endpoint of all-cause mortality or CV hospitalisation was neutral. Furthermore, no significant differences were found between the two groups in any of the secondary endpoints, and none of the baseline characteristics (age, gender, NYHA Class, type of device, history of coronary artery disease or history of atrial fibrillation) identified any group in which remote monitoring was more effective than usual care alone.

In the modern era of digital health we could find no evidence of additional benefit from weekly remote monitoring of these devices,” said presenting investigator Martin Cowie from Imperial College London. ‘Our

USE OF IMPLANTABLE cardioverter-defibrillators in patients with non-ischaemic systolic heart failure did not improve overall survival over usual care, according to results presented a Hot Line study yesterday.

The DANISH trial, published simultaneously in the New England Journal of Medicine, did, however, show that the risk of sudden cardiac death in these subjects was halved. There were also findings related to age, with those under 68 showing a lower mortality rate.

The study, which was said to be the first to consider ICDs within the context of ‘modern therapy’, raised questions about the role and recommendation of ICDs in non-ischaemic HF.

Prophylactic ICD implantation currently has a class IB recommendation in European and US guidelines and a class IB in Europe for patients with HF but without CAD. However, a significant difference (HR 0.87, 95% CI 0.69-1.12) was found in the secondary outcome of SCD, which occurred in 6.4% of ICD patients and 8.5% of controls (HR 0.85, 95% CI 0.60-1.21, P=0.01).

Continued on page 2
CONTINUOUS positive airway pressure (CPAP) does not prevent cardiovascular events in patients with moderate-to-severe obstructive sleep apnea (OSA) and established CV disease, according to the population-based SAVE study. Presented as a Hot Line yesterday, the findings were published in the New England Journal of Medicine.

The results were not expected. ‘Given the level of risk of cardiovascular disease attributed to OSA in previous observational studies, we were surprised not to find a benefit from CPAP,’ said presenter Doug McEvoy, from the Adelaide Institute for Sleep Health, Australia.

OSA affects around 40-60% of patients with CVD and has been associated with increased risk of cardiovascular events. It is known to cause episodic hypoxaemia, nocturnal sympathetic activation and elevated blood pressure, and also to influence oxidative stress, inflammation and hypercoagulation. Furthermore, large negative intrathoracic pressure swings impose mechanical stress on the heart and great vessels.

CPAP has indeed reduced the incidence of future CV events among those with OSA. Observational studies have shown that CPAP use is associated with lower rates of CV complications and death, especially among patients who are adherent to treatment. However, randomised trial data is lacking for any benefit of OSA treatment for CVD prevention. The Sleep Apnea Cardiovascular Endpoints (SAVE) study was thus designed to explore whether treatment with CPAP reduces the risk of future CV hospitalisation for TIA, unstable angina or HF.

‘Save was a long-term study, and it did have a high adherent rate,’ said lead investigator Vimalkumar Verma, from St George’s Hospital, London. ‘It was a large and well-powered study, and our findings are in line with other recent studies, which have also failed to show any benefit from CPAP use in the prevention of CV disease.’

In the SAVE trial, 522 patients with moderate to severe OSA and ≥3 CV risk factors were randomised to receive CPAP treatment plus usual care (n=159) or usual care alone (n=158).

The patients, who were recruited from 89 clinical centres in seven countries, had a one week run-in with a sham CPAP mask prior to randomisation. They had to demonstrate effective use for a minimum of three hours a night. The investigators excluded those with severe sleepiness, very severe oxygen deprivation, advanced HF, and poor CPAP use. The primary endpoint was a composite of CV death, MI, stroke, hospitalisation for TIA, unstable angina or HF.

Results showed a decrease of 20-30% in episodes of depression among patients, and fewer days were lost due to ill-health. ‘It’s a big challenge in the field to have people use this treatment throughout the night,’ said McEvoy. ‘There’s some evidence that when you use it may be important. There are some studies showing that people who use it only in the first half of the night may not get benefit, particularly as it’s the latter part of the night when REM sleep is known to produce more severe OSA.’

However, not all was disappointment. The study also showed that CPAP significantly improved patient well-being. It reduced snoring and daytime sleepiness (P<0.001 vs. controls) and improved health-related quality of life and mood. There was a decrease of 20-30% in episodes of depression among patients, and fewer days were lost due to ill-health. ‘It’s a big challenge in the field to have people use this treatment throughout the night,’ said McEvoy. ‘There’s some evidence that when you use it may be important. There are some studies showing that people who use it only in the first half of the night may not get benefit, particularly as it’s the latter part of the night when REM sleep is known to produce more severe OSA.’

The study used ‘ischaemia tolerant’ mesenchymal stem cells (itMSC) donated by healthy volunteers and grown under chronic hypoxic conditions, which are believed to enhance immune modulatory properties. In this single-blind, placebo-controlled, crossover, multicentre study, 20 patients with non-ischaemic cardiomyopathy and left ventricular ejection fraction ≤40% and NYHA class II-III were randomised to receive intravenous itMSC therapy (n=10) or placebo (n=12) for 90 days and then crossed over to the other treatment.

Results at 90 days post itMSC infusion showed there were no major differences in primary safety endpoints of all-cause hospitalisation, and adverse events between the two groups. However, compared to placebo, itMSC therapy resulted in statistically significant improvements in the six-minute walk tests, as well as greater improvements in the Kansas City Cardiomyopathy Questionnaire scores.

‘To our knowledge, this trial represents the first experience with intravenously administered itMSCs in patients with any type of chronic cardiomyopathy,’ said Butler, adding that further studies should explore the efficacy of serial dosing for more sustained immunomodulatory effects.
New practice guidelines in heart failure

IN THE LATEST ESC guidelines for the diagnosis and treatment of acute and chronic heart failure several new points are emphasised which aim to move HF management into new areas, including prevention.

HF remains an unmet medical challenge worldwide with increasing prevalence despite better management of cardiovascular conditions, including acute coronary events. New guidelines therefore emphasise the potential of ACE inhibitors, beta-blockers and statins to prevent or delay HF and to prolong life in those with arterial hypertension and CAD.

Once a patient presents with suspected HF of non-acute onset, first step should be an assessment of clinical probability before HF diagnosis and management. It is important to diagnose HF remains an unmet medical challenge worldwide and increase prevalence despite better management of cardiovascular conditions, including acute coronary events. New guidelines therefore emphasise the potential of ACE inhibitors, beta-blockers and statins to prevent or delay HF and to prolong life in those with arterial hypertension and CAD.

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Stepping up the run rate: Today’s debate asks if more exercise will be better for us or worse?

Yes, better

says Sanjay Sharma
St George’s University of London, London

Regular exercise reduces the risk of cardiovascular mortality and all-cause mortality by up to 50% and 30% respectively. Several studies show an inverse relationship between physical fitness and relative risk of mortality; in general there is a 10-20% reduction per MET when exercised between 4 and 12 METs. Most studies have assessed relatively few individuals capable of exercising beyond 12 METs and been unable to demonstrate any additional mortality benefit in this small cohort.

Current physical activity guidelines recommend 30 minutes of moderate exercise (4-5 METs) at least five times weekly or 20 minutes of vigorous exercise (≥6 METs) at least three times weekly; however, many competitive athletes and individuals engaging in recreational endurance events such as the marathon or triathlon exercise much more intensively than 12 METS and exceed current recommendations by 10-15 times.

The deleterious effects of exercise on a normal heart – A speculative myth

There has been an exponential increase in the number of marathon runners over the last 20 years, with over 2 million marathon runs per year in Europe. In parallel, there has been a plethora of publications alluding to the potential dangers of intensive exercise in athletes with an otherwise normal heart. These concerns are fundamentally based on the detection of high serum concentrations of biomarkers of cardiac damage and decrease in cardiac function following an endurance event. Some researchers have speculated that such episodes could reflect myocardial inflammation and may lead adverse cardiac remodelling and an arrhythmogenic substrate.

But in reality there is no evidence whatsoever linking transient increases in biomarkers of cardiac damage to permanent cardiac inflammation or myocardial fibrosis. On the contrary, all studies have shown that these changes are transient and completely reversible within a few days.

Cardiovascular magnetic resonance (CMR) studies performed immediately after a marathon run in individuals with raised serum cardiac troponin concentrations have not shown any evidence of myocardial inflammation. Furthermore, animals that are sacrificed a few weeks after detraining do not reveal any fibrosis, suggesting that the process is reversible and may represent compensatory remodelling as opposed to pathology.

Only a few studies have reported myocardial fibrosis in veteran marathon runners and these are mired by small sample size and lack of statistical significance in the results. In contrast, others have shown no evidence of fibrosis. There are also small studies demonstrating increased CAC and right ventricular dysfunction in endurance athletes.

The former studies have investigated athletes with established risk factors for atherosclerosis and the latter have reported on a select group of athletes presenting with ominous symptoms or life-threatening arrhythmias. There is some evidence that lifelong-elite athletes reveal a higher prevalence of atrial fibrillation, but this has not been confirmed by all studies.

More exercise is better: The numbers say it all

A recent American study of 42,000 sedentary subjects and 13,000 runners reported a very positive impact of jogging on cardiovascular mortality. The benefits were similar in those who exercised moderately and those who exercised more intensively and for a prolonged duration, but there was no upper limit. A recent study of 37,855 middle aged individuals with high fitness levels showed progressive survival benefit with increasing fitness in the 1893 with fitness levels ≥14 METS.

Similarly, a meta-analysis of 628,000 (where the sedentary group alone exceeded the largest number of subjects ever studied in former observational studies investigating the association between exercise and mortality) showed that those who exercised five times above the current recommended levels of achieved the greatest mortality benefit (HR 0.61). This benefit persisted (with was no harm) in those exercising 10 or more times the recommended level of exercise.

Intuitively, too much of anything may be bad for health; however, there is no convincing data to show any evidence of an upper limit of exercise dose, or that ‘more is worse’. Perhaps the best evidence for this could be inferred from studies reporting that former Olympians and Tour de France athletes live considerably longer than the general population.

Well...

Certainly, the major problem worldwide is not excessive endurance exercise (EEE), but rather that physical inactivity poses perhaps the century’s greatest threat to health. Saying this, however, raises a serious question about the optimal dose of exercise training (ET) and whether EEE could have adverse effects.

In 2014 we studied the effects of running on 55,000 subjects followed for an average of 15 years and found that those running for a longer duration, but not running more than the current recommended levels of exercise training (ET) had the safest way to health. If we could give every individual the right amount of exercise training, the reason should not be for health benefits but rather to improve athletic performance, or simply for competition, fun, ego or camaraderie. For health, the evidence supports what Hippocrates said centuries ago: ‘If we could give every individual the right amount of exercise training, the reason should not be for health benefits but rather to improve athletic performance, or simply for competition, fun, ego or camaraderie’. If we could give every individual the right amount of exercise training, the reason should not be for health benefits but rather to improve athletic performance, or simply for competition, fun, ego or camaraderie.

The conclusion from our own research of is not intended to scare athletes away from participating in marathons or triathlons, because the serious risks from these events are quite low. However, the maximal benefits of ET from a health perspective appear to occur at quite low levels. If an athlete is performing EEE, the reason should not be for health benefits but rather to improve athletic performance, or simply for competition, fun, ego or camaraderie. If we could give every individual the right amount of exercise training, the reason should not be for health benefits but rather to improve athletic performance, or simply for competition, fun, ego or camaraderie.

EEE, such as marathon running and triathlons, have the potential for cardiotoxicity, including release of troponin, brain natriuretic peptide, and the development of cardiac dilatation and dysfunction, especially of the ventricular septum and the right side of the heart.

Some animal studies have also suggested toxicity of EEE; humans with EEE have increased coronary artery calcification and possibly soft plaque, and, although sedentary lifestyle is associated with increased risk of atrial fibrillation (AF) and low to moderate ET seems to reduce the risk of AF, high ET has been associated with increased AF in many individual studies and meta-analyses.

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Don’t miss: More exercise: better or worse? 29 August 16:30-18:00  Galileo - The hub

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In 2014 we studied the effects of running on 55,000 subjects followed for an average of 15 years and found that those low-dose runners in Q1 (>6 miles per week, 1-2 times per week, <52 minutes) had maximal benefits in terms of mortality and CVD mortality; this benefit was equal to Q2-4, with a slightly non-significant trend to better survival than the higher dose runners in Q5. Recently in the Mayo Clinic Proceedings, we divided those in Q5 into tertiles (T) and found that those in Q5 T3 (of the top 7% of runners regarding higher doses) seemed to lose the mortality benefit of running when compared with non-runners. This would certainly suggest that more is not better - and even the possibility that more could be worse.

Data from Wen and colleagues in over 400,000 people from Taiwan also suggest that maximal benefit from vigorous ET seems to occur after 30-40 minutes. Very high doses of EEE, such as marathon running and triathlons, have the potential for cardiotoxicity, including release of troponin, brain natriuretic peptide, and the development of cardiac dilatation and dysfunction, especially of the ventricular septum and the right side of the heart.

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Direct thrombectomy without thrombolysis in acute stroke

A FURTHER REPORT from the ongoing PRAGUE registry studies indicates that direct catheter-based thrombectomy is as effective as bridging thrombolysis in the treatment of acute ischaemic stroke.

As background to the study, which will be presented in a Registry Session this afternoon, Petr Widimsky of Charles University, Prague, explained that, if left untreated, acute ischaemic stroke caused by a major artery occlusion would result in death for up to half of all patients and an additional 40-50% would be left permanently disabled. ‘In other words,’ he warned, ‘without treatment only a few patients with major ischaemic stroke survive without severe sequelae.’ Survival increases to around 20-30% with thrombolytic treatment.

In 2015 several randomised trials showed that 45-50% of patients can survive and be functionally independent with endovascular mechanical thrombectomy. If the intervention is performed very early (within three hours from stroke onset), the results are even better – up to 70% of patients may return to normal daily life. As a result of these studies, and updates to some guidelines, mechanical thrombectomy is now recommended for all patients and an additional 40-50% would be left permanently disabled. ‘In other words,’ he warned, ‘without treatment only a few patients with major ischaemic stroke survive without severe sequelae.’ Survival increases to around 20-30% with thrombolytic treatment.

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‘So the study’s aim,’ said Widimsky, ‘was to evaluate the feasibility and safety of d-CBT performed in close cooperation between cardiologists, neurologists and radiologists – a true interdisciplinary approach.’

PRAGUE-16 was a prospective, observational pilot registry study. It included 103 patients who presented within six hours of the onset of moderate to severe acute ischaemic stroke. Patients had an occluded major cerebral artery but no large ischaemia on a CT scan. The attending neurologist decided whether patients received d-CBT or bridging thrombolysis plus CBT depending on the clinical picture and CT scan. The intervention was performed within 60 minutes of the CT scan.

Some 73 patients received d-CBT and 30 had bridging thrombolysis plus CBT. Good functional outcome was achieved in 41% patients overall with similar results between the two groups. ‘This compares to 48% given this intervention in seven randomised trials performed in expert neuroradiology units,’ said Widimsky.

‘Our findings suggest that direct catheter-based thrombectomy performed in a timely manner may be an alternative to thrombectomy after bridging thrombolysis,’ said Widimsky.

‘Furthermore, in regions with no or limited neuroradiology services, treatment might be offered via interventional cardiology in close cooperation with neurologists and radiologists. However, both of these preliminary conclusions should be confirmed by larger multicentre studies or large international registries.’

Don’t miss: Feasibility and safety of direct catheter-based thrombectomy in the treatment of acute ischemic stroke. Prospective registry PRAGUE-16. 29 Aug 16:45-17:00 – Sarajevo, Village 2

Alcohol linked to higher stroke risk

ALCOHOL-RELATED hospitalisation is associated with a doubled risk of ischaemic stroke in patients with non-valvular atrial fibrillation, according to a study reported at a press conference by cardiologist Faris Al-Khalili from the Karolinska Institute, Stockholm. This observational population study was performed in more than 25,000 non-valvular atrial fibrillation patients at low risk of stroke identified from 345,123 AF patients in the Swedish national patient register between 2006 and 2012.

The registry data showed that ischaemic stroke occurred at an annual rate of 3.4 per 1000 patient-years. In the multivariable analysis, the only variables that remained significantly associated with an increased risk of ischaemic stroke were age and alcohol related hospitalisation (HR 2.01, p <0.001).

‘Doctors should ask their AF patients about alcohol use and advise patients to cut down if they are drinking more than is recommended,’ warned Al-Khalili.
HDL: a question of quantity or quality? Unravelling the conflicting results of HDL’s atheroprotective effect

By Johann Wojta
Medical University of Vienna
Austria

UNTIL RECENTLY it was undisputed dogma that high-density lipoprotein cholesterol (HDL-C) has solely atheroprotective properties. This notion was based on population studies and meta-analyses showing an association of high HDL-C plasma levels with a decreased risk for cardiovascular disease. Recently, however, this view has been challenged, mainly by clinical studies showing that HDL-C levels predict cardiovascular death only in individuals without CAD. Several lipid-lowering trials showed no or only a weak impact of low HDL-C levels on cardiovascular risk. For example, in the PROVE-IT/TIMI 22 trial the levels of HDL-C reached had no predictive value in ACS patients under aggressive atorvastatin therapy. However, in the COURAGE trial an association of HDL-C plasma levels with a decreased risk for cardiovascular disease. For example, in the lipid-lowering trials showed no or only a weak impact of low HDL-C levels on cardiovascular risk. These conflicting and controversial results have led to the concept of dysfunctional HDL, by which the atheroprotective role of HDL-C does not depend on the transported cholesterol but rather on properties of the HDL particles themselves. Addressing this concept, recent intensive research has shed some light on the heterogeneity of HDL particles possibly responsible for the contradictory findings. HDL particles can be divided in various sub-fractions or subpopulations depending on their size, composition, density, charge and physiological function. This heterogeneity is a result of the varying contents of lipids and proteins of the respective LDL particles in which size and density show an inverse correlation. According to density, HDL particles can be classified as HDL2, which are large and less dense, and as HDL3, which are small and dense. Another property of HDL particles is their respective shape. Discoidal HDL particles are present in patients with CAD and contain mainly apolipoprotein A-I (apo A-I), whereas spherical HDL particles are larger and contain cholesteryl ester and some triglycerides. The most abundant protein in HDL particles is apo A-I, followed by apo A-II which together make up close to 90% of the total protein content. HDL particles also contain proteins involved in lipid transfer such as cholesteryl ester transfer protein (CETP) and phospholipid transfer protein (PLTP) and lipidic proteins such as lecinthin cholesteryl acyl transferase (LCAT). The varying content and/or impaired function of these proteins might be related to the anti- or pro-atherogenic effects observed for HDL particles in various settings. The major atheroprotective effect of HDL is thought to be associated with its function in reverse cholesterol transport. Anti-inflammatory, anticoagulant and antioxidative effects have also been described. The anti-inflammatory and antioxidative effects are brought about by PON-1, whereas the anticoagulant properties of HDL seem to be related to its ability to reduce platelet activation and decrease expression of tissue factor. These atheroprotective effects are lost in dysfunctional HDL. Current knowledge is that the transferred HDL is still fragmentary and mainly based on in vitro findings. However, it is generally believed that systemic inflammation seen in pathologies such as metabolic syndrome, diabetes, CAD and infections contribute to the conversion of HDL-C from an antiatherogenic to a proatherogenic molecule. In summary, the controversy of the atheroprotective role of HDL-C fuelled by conflicting clinical data might be explained by the fact that the exact function of HDL-C and thus its role in the development of cardiovascular pathologies depends not so much on its quantity but rather on its lipid and protein composition, with the small dense fraction having the highest antiatherogenic activity.

It thus seems likely that the concept of dysfunctional HDL-C will lead to assays with greater sensitivity and specificity and will shape future therapies, which will not only be based on quantitative but more on qualitative modifications to change or modulate functions of HDL-C.
OF THE NINE TARGETS and 25 indicators of the Global Monitoring Framework adopted by the UN in 2011 for the control of non-communicable diseases, three were in the specific area of CVD: to reduce the incidence of heart attack and stroke through the wider prescription of drug therapy, to halve the rise in diabetes and obesity; and to bring about a 25% reduction in ‘raised blood pressure’. And all before 2025.

As an action plan for these three daunting objectives, the World Heart Federation devised a set of roadmaps whose content not just marked out the rocky road to achievement but also profiled the roadblocks on the way and how they might be faced. And one of these roadmaps - on reducing CVD mortality through the prevention and management of raised BP - will be under the spotlight in a Joint Session this afternoon hosted by the ESC and International Society of Hypertension.

Professor Neil Poulter, who will take over as President of the ISH in September, says the challenge of meeting the hypertension target in developing countries ‘is time’, and ‘what we can practically do before 2025’, particularly in the face of the roadblocks he and his fellow authors saw in the WHF roadmap. These, says Poulter, include a widespread unawareness of hypertension risk or status, limited application of guidelines, inadequate resources for screening and medical treatment, and of course prioritisation in a huge catalogue of pressing healthcare needs. But overall, says Poulter, ‘it all depends on resources’.

Poulter and his roadmap colleagues accept the widely held guideline definition that the ‘normal’ BP threshold is 140/90 mmHg, which in an ideal world would be confirmed in several readings. A systolic BP of 140-159 mmHg would be managed with at least dietary and other lifestyle changes, while measurements above 160 mmHg would require antihypertensive agents in addition. Yet even here, in what might be a relatively straightforward recommendation, the barriers to achievement are huge; a ‘care gap’ between best practice and usual practice. In most of the developing regions, and especially in Africa, a clear picture of hypertension is simply not evident. However, Poulter cites the PURE study of 2013 to report that awareness of hypertension in low income countries is no better than 40%, which in turn might lead to a treatment prevalence of 30% and a control rate of 13%. At 46%, 40% and 13% respectively, the equivalent global figures are not much better. ‘They’re hopeless,’ says Poulter. ‘We should be aiming for an awareness rate of at least 60%.’ For only then, he argues, can the cascade of detection and management even begin.

Indeed, adds Poulter, awareness in low income countries may also be low because of a belief that hypertension is a disease of ‘rich countries’. Hence, screening programmes may not even exist. And even if there is limited awareness, health systems may not be equipped for the prevention and management of hypertension.

With such challenges, Poulter and colleagues advocate opportunistic screening, blood pressure measurement at every clinic, pharmacy or doctor visit, which they describe as ‘crucial’. In low resource settings, two readings in near sequence are recommended. The PURE study also found that the lowest uptake of antihypertensive drugs was in low income countries and concluded that cost was still a limiting factor. Poulter, who is Professor of Preventive Cardiovascular Medicine at Imperial College London, and Co-Director of the Imperial Clinical Trials Unit, also notes an absence of clinical trials of antihypertensives in ethnic populations of Africa and South-east Asia. So medical treatment in low income countries will be empirical at best, guided only by recommendations developed for richer countries. It’s Poulter’s hope that a new trial in an African population can start early next year under his direction.

No-one’s holding their breath that the 2025 targets in secondary prevention and hypertension can be universally met, but at least there are targets - and an action plan which identifies three key steps for real action: opportunistic screening, improved treatment, and education. With WHO attributing 45% of all CVD deaths to hypertension, even a little progress will have a substantial impact.
What in your opinion is the most valuable lifestyle advice?

Quitting smoking is one of the most important lifestyle changes people can make. That’s along with exercise and improving your diet. About 30% of Norwegians were smokers a decade ago - now the figure is more like 13%. Prevention programmes have helped, although in my view smoking cessation clinics are not always necessary. They’re only practical in big cities where it’s easy for people to access them. And not everyone wants to go to a clinic. Education is a big factor in the likelihood of someone being a smoker or not. The more educated someone is, the less the chance they will smoke.

There’s no excuse for people not to be active - everyone can do something. Every movement made expends energy and improves the function of the cardiovascular system. In the Philippines, the Heart Association has launched a campaign to encourage people to take an hour of exercise a day and that includes walking. There are also four minute exercises that people can do in the office such as stretching or lunges. With the older patients we see, we recommend walking to avoid any complications and will monitor their heart rate. It’s all about building exercise into your daily regime. The only cautionary advice I'd give is not to over-exercise especially if you’re a patient with HF.

Exercise is the most important action people can take to improve their cardiovascular health. I advise both my primary and secondary prevention patients to do a minimum of 30 minutes moderate to heavy exercise each day. Exercise delivers a number of clinical benefits - raising HDL levels, improving endothelial function, and encouraging the growth of collateral arteries. In each consultation I share with my patients my own exercise regimen where I make sure to go on a run every day before work. When patients have cardiovascular disease, it’s important to individualise their exercise so they can do it safely.

Eduardo Nagle Czita, clinical cardiologist from Rio de Janeiro, Brazil

Helen Ong-Garcia, cardiologist and rehabilitation specialist, San Juan City, Philippines

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Supporting a healthy lifestyle through exercise: Benefits for every age group.

Norway faces the challenge of smoking prevention. In the last decade, the prevalence of smoking among Norwegians has decreased significantly. From 30% a decade ago, it is currently around 13%. These changes have been facilitated by various educational and prevention programmes. Education plays a crucial role in reducing smoking, as the more educated a person is, the less likely they are to smoke.

There's no reason for anyone not to be active. Exercise is essential for maintaining cardiovascular health and improving overall function. People can do something as simple as walking in the office or performing short exercises like stretching or lunges. For older patients, walking is recommended to avoid complications, with monitoring of heart rate.

Exercise is the most important action people can take to improve their cardiovascular health. It is advised that both primary and secondary prevention patients engage in at least 30 minutes of moderate to heavy exercise daily. Exercise delivers multiple benefits such as raising HDL levels and improving endothelial function. It is also important to individualise exercise to fit the needs of each patient.