



Congress Review

Review of the European Society of Cardiology (ESC) Congress 2020

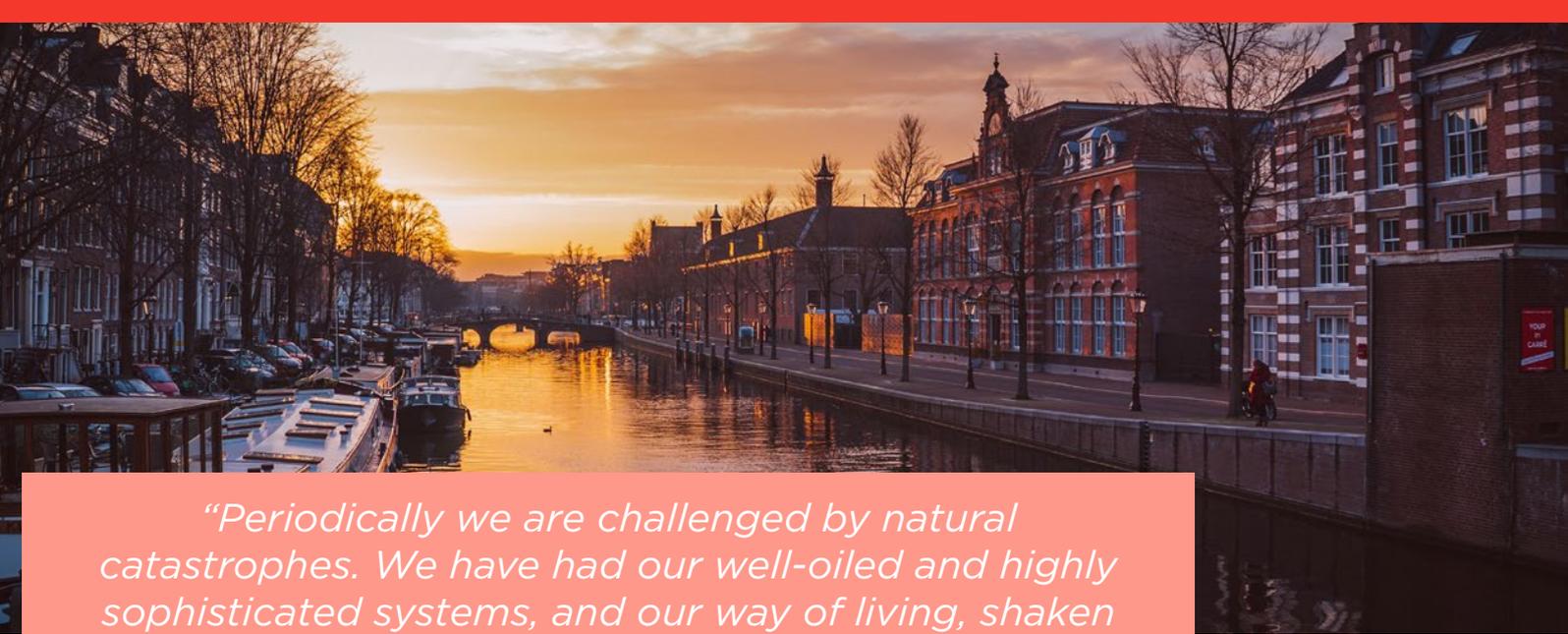
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FOUNDATIONS comprising more than a million poles, each of which is rooted 12 metres into the ground, support the historic city of Amsterdam, which was set to house this year's European Society of Cardiology (ESC) Congress before the coronavirus disease (COVID-19) pandemic architected its transition to a digital experience. Capital of the Netherlands and blue printed with over 1,200 bridges, the metropolis was the perfect backdrop as it provided the framework for the archway between keynote speakers and medical professionals in their *huizen* all over the world.

“Welcome to virtual Amsterdam”: Prof Barbara Casadei, President of the ESC, delivered the inaugural session with a green-screen backdrop featuring iconic landmarks of the city: canals, windmills, and cobbled streets, mixed with the city's 17th century UNESCO status buildings. Welcoming delegates to ‘The Digital

Experience’, Prof Casadei addressed the elephant in the room: the impacts of COVID-19 on the ESC community: “Periodically we are challenged by natural catastrophes. We have had our well-oiled and highly sophisticated systems, and our way of living, shaken by a fragment of RNA.”

A record-breaking event, the online meeting attracted 116,000 healthcare professionals from 211 countries. Considering 33,510 delegates from 150 countries attended in 2019, the suggestion is that the transition to a virtual event allowed for greater global participation, which will be key to the long-term future of medicine, as well as in the short-term to overcome the current challenges facing the medical community. “Patient care in the COVID-19 outbreak has not been 21st century medicine,” said Prof Casadei. She continued: “It was not what we trained for, not what our trainees were aspiring to do.” Without knowing if treatments would bring benefit or harm, clinicians have had



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to make life-influencing decisions. Prof Casadei summarised this: “We have had to base our practice on anecdotes.”

By coming together virtually, it was the hope of the ESC President that informed patient care would prevail over the confusing matters surrounding the disease, such as small studies, or those with inadequate design, which had been published in respected journals, before having to be retracted on the grounds of inaccuracies. However, she reminded everyone that: “At times such as this, what we have in common counts so much more than our differences.”

Beyond COVID-19-related content, ‘Spotlight 2020: The Cutting Edge of Cardiology’ was the overarching theme of the ESC Congress 2020, with sessions highlighting applications of the latest technology in clinical cardiology, including: the use of advanced therapies, involving stem cells and genes, moving towards personalised medicine; big data, artificial intelligence and wearable technology to reshape the delivery of medical care; and robotics to introduce remote care and remote interventional cardiology to patients worldwide.

In what was the biggest online gathering of cardiovascular professionals the world has ever seen, more than 4,000 abstracts were presented, alongside 70 late-breaking science studies reported across the 4-day event. As is tradition,

ESC launched several of their Clinical Practice Guidelines at the congress, with live presentations combined with interactive panel discussions on updated clinical practice for atrial fibrillation, adult congenital heart disease, non-ST-segment elevation acute coronary syndromes, and sports cardiology and physical activity in patients with cardiovascular disease, the latter of which has been included in our Congress Review.

Late-breaking abstracts of the congress have also been summarised in *EMJ Cardiology*, covering topics such as smoking cessation reducing stroke risk in atrial fibrillation, long naps increasing the risk of cardiovascular disease, and why not all vegetarian diets are linked to improved cardiovascular health.

More than 400 topics covering the entire spectrum of cardiology were offered by the ESC Congress 2020, all with the mission of ESC in mind: to reduce the burden of cardiovascular disease. All attendees of the inaugural session were left feeling inspired by Prof Casadei and her commitment to the ESC mission, who left delegates with the words: “The effort and ingenuity of our community will ensure progress in the care of our patients with cardiovascular disease and prosperity for our society.”

EMJ looks forward to welcoming you all, hopefully for a face-to-face meeting, to London, UK next year for the 2021 meeting of the world’s largest cardiology congress.

ESC 2020 REVIEWED →

Gut Dysbiosis May Be Associated with High Blood Pressure

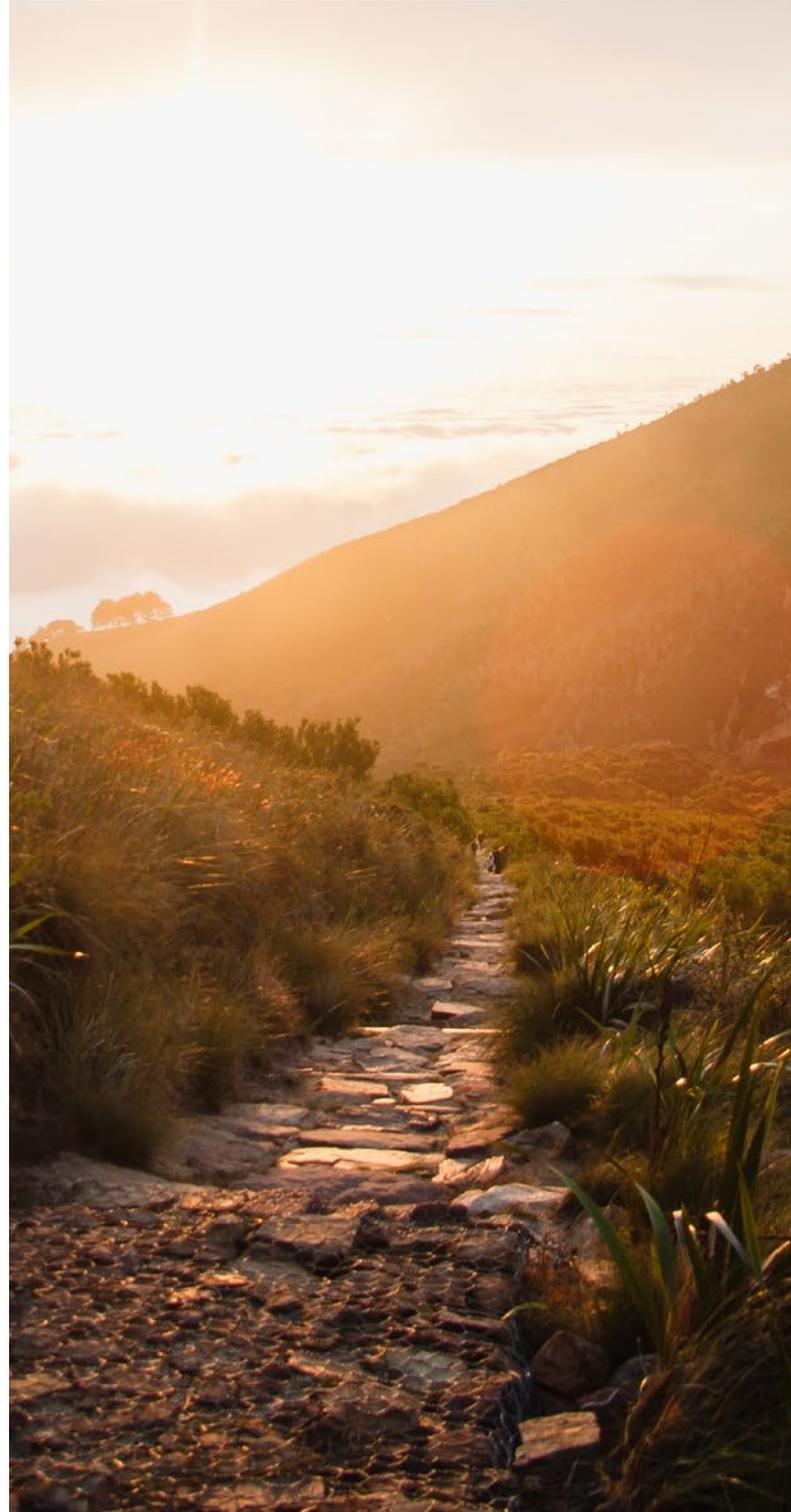
MICROBIOTA in the digestive tract are associated with numerous health conditions, including those outside of the gut. A study presented at ESC Congress 2020 and in a press release dated 27th August 2020 found that bacteria and other microorganisms in the digestive tract are linked to conditions such as heightened blood pressure, blood lipids, and BMI.

While small-scale studies have been conducted and have shown an association between the gut microbiome and single diseases, for the first time the researchers investigated numerous diseases within a single cohort. Further explaining the rationale behind the study, study author Dr Hilde Groot of University Medical Centre Groningen, Groningen, the Netherlands, noted: “Previous research has shown that the human gut microbiome composition could be partially explained by genetic variants. So, instead of directly measuring the make-up of the microbiome, we used genetic alterations to estimate its composition.” The UK Biobank was used as the source of data, from which 422,417 unrelated individuals (average age: 57 years; 54% female) who had undergone genotyping were sourced, including information such as diseases, BMI, and blood pressure of the individuals.

Increases in 11 bacteria were associated with 28 health and disease outcomes, including chronic obstructive pulmonary disease and high blood pressure, blood lipids, and BMI. One particular example is the relationship between bacteria of the *Ruminococcus* genus and blood pressure, in which higher levels of *Ruminococcus* bacteria were linked to increased blood pressure.

“Our study indicates that microbiota might have an important role in maintaining health and could help us develop novel treatments,” said Dr Groot. While these results are a step in the right direction to characterising the impact of dysbiosis in the gut microbiome on human health, the researchers acknowledged the need for follow-up studies to validate these findings.

“Our study indicates that microbiota might have an important role in maintaining health and could help us develop novel treatments.”



Association Between Depression and Anxiety in Young Males and Myocardial Infarction Risk

ADOLESCENTS who have experienced mental health conditions such as depression and anxiety have been linked to an increased risk of myocardial infarction in mid-life, according to a new study presented at ESC Congress 2020 and in a press release dated the 26th August 2020.

With indications suggesting that the mental well-being of young people is declining, the researchers aimed to investigate what impact this may have on the health of the individuals later in their life. Males who were born between 1952 and 1956 who had undergone extensive medical examinations as part of assessments in compulsory military service were included in the study (N=238,013). The medical examinations comprised assessments from physicians and psychologists for both medical and psychiatric means, and took place when the males were 18 or 19 years of age, through to middle age (up to 58 years). Non-psychotic mental health disorders, such as depression or anxiety, were diagnosed in 34,503 males at conscription. Using psychologist interviews and questionnaires, as well as familial,

social, medical, behavioural, and personality characteristics, the ability to cope with stress in day-to-day life (also known as stress resilience) was also assessed.

Through the use of hospital records, the investigators found that experiencing a mental health condition during adolescence was associated with a 20% higher risk of having a myocardial infarction by middle age. The influence of stress resilience on this outcome was then assessed, for which it partially described the link. Study author Dr Cecilia Bergh Örebro University, Örebro, Sweden, highlighted that: "Better fitness in adolescence is likely to help protect against later heart disease, particularly if people stay fit as they age. Physical activity may also alleviate some of the negative consequences of stress. This is relevant to all adolescents, but those with poorer wellbeing could benefit from additional support to encourage exercise and to develop strategies to deal with stress."



"Experiencing a mental health condition during adolescence was associated with a 20% higher risk of having a myocardial infarction by middle age."



Smoking Cessation Reduces Stroke Risk in Atrial Fibrillation

QUITTING smoking can reduce risk of stroke in atrial fibrillation (AF). While smoking is known to increase risk of developing AF, a Korean study has examined the impact of smoking cessation on later risk of stroke and death, as described in a press release from the ESC Congress 2020 dated 25th August 2020.

AF will develop in one in four adults in Europe and the USA, and is projected to affect 17 million people in the European Union by 2030. AF increases risk of stroke by five times, and increases risk of death following stroke by two-fold in females and 1.5-fold in males.

The study examined the influence of smoking cessation following new AF diagnosis on risk of stroke and all-cause death by comparing national health check-up data from the Korean National Health Insurance Service and National Health Screening databases from 2010 to 2016. In this period, 523,174 patients were newly diagnosed with AF; researchers examined the outcomes for the 97,637 patients who had a national health check-up <2 years prior to this new diagnosis and a second check-up within 2 years following the new diagnosis.

"Regardless of how much you smoke, kicking the habit is good for health."

The researchers classified these patients by smoking status: never smokers (51.2%), ex-smokers (quit prior to diagnosis; 27.3%), quitters (quit following diagnosis; 6.9%), and current smokers (14.6%). Over the median 3-year follow-up, there were 3,109 strokes and 4,882 all-cause deaths. Quitters had a 30% lower likelihood of stroke compared to current smokers, and a 16% lower risk of all-cause death, even after considering other factors including age, sex, blood pressure, BMI, and physical activity. Quitters remained at a higher risk compared to never smokers, although this association was noted only in males. New smokers (commencing following diagnosis) had the highest increase in stroke risk, with an 84% increase in probability compared to those who had never smoked.

The study message for clinicians and patients was highlighted by Dr So-Ryoung Lee, Seoul National University Hospital, Seoul, Korea: "If you don't smoke, don't start. If you do, it's never too late to quit. Regardless of how much you smoke, kicking the habit is good for health."

Long Naps Increase Risk of Cardiovascular Disease

ONE hour or longer naps (long naps) have been identified as a risk factor for all-cause death and a higher likelihood of cardiovascular disease (CVD), according to results published by authors from Guangzhou Medical University, Guangzhou, China and reported in a press release dated 26th August 2020 at the ESC Congress 2020.

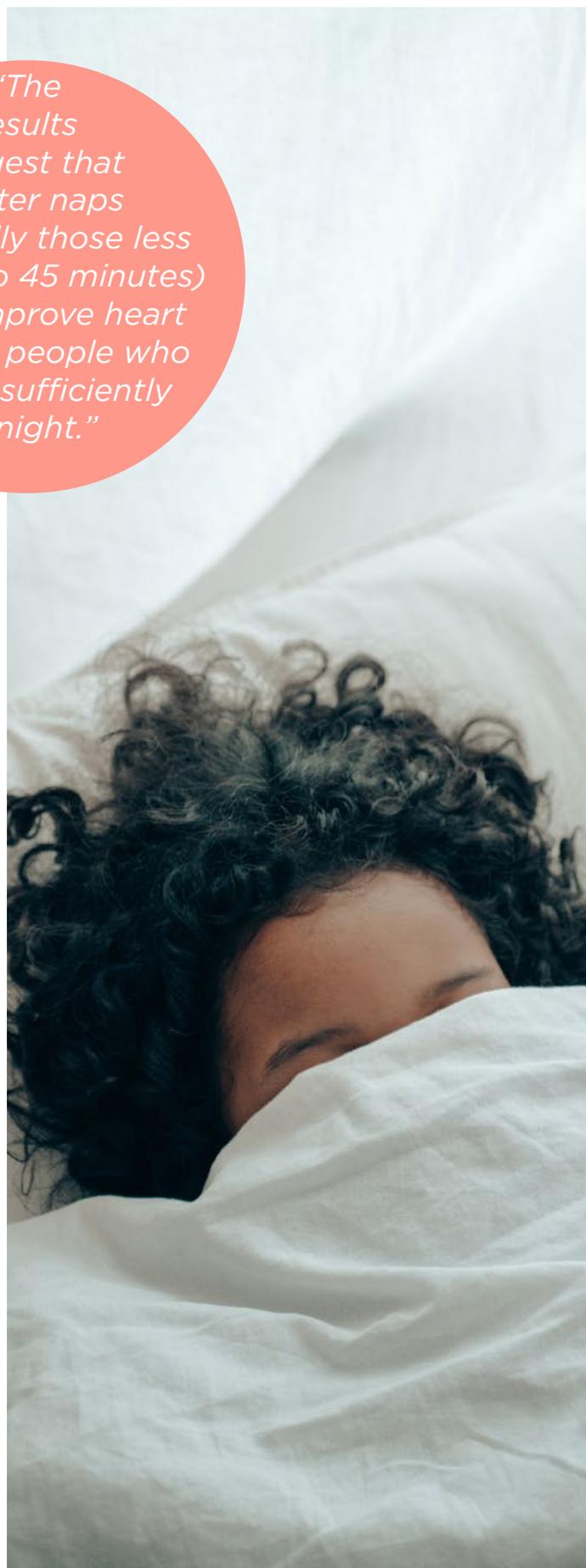
An association between lengthy naps and CVD and all-cause mortality has long been suggested, but the evidence is controversial. The study authors therefore took it upon themselves to undertake a systematic review and dose-response meta-analysis of the relationship. This study included 313,651 participants from >20 countries, of whom 39% took naps.

Long naps were found to increase risk of all-cause death by 30% in both males and females. In a subgroup analysis of participants who took long naps and were also female and aged >65 years, there was a significantly higher risk of CVD compared to those who did not nap. In the population of those aged >65 years, naps of any length increased risk of death by 17% overall, which rose to 22% in the female population. The reasons for this are still unclear, though previous studies have linked the association to high blood pressure, diabetes, higher levels of inflammation, and poorer overall physical health.

In comparison, naps for <60 minutes showed no significance in increasing risk of cardiovascular disease. First author Dr Zhe Pan summarised these comparative findings: “The results suggest that shorter naps (especially those less than 30 to 45 minutes) might improve heart health in people who sleep insufficiently at night.”

He concluded: “If you want to take a siesta, our study indicates it’s safest to keep it under an hour. For those of us not in the habit of a daytime slumber, there is no convincing evidence to start.”

“The results suggest that shorter naps (especially those less than 30 to 45 minutes) might improve heart health in people who sleep insufficiently at night.”



Results of 14-year Study Show Benefits of Deep Chest Compressions

DEEP chest compressions for cardiopulmonary resuscitation (CPR) can crack ribs, but can reduce brain damage during cardiac arrest. This is according to the results of a new study presented as part of a press release dated 24th August at the ESC Congress 2020.

Every 5 years, guidelines to aid healthcare professionals and the public to perform CPR are updated. The recommendation for deeper chest compressions introduced in 2010 garnered concerns for the increased risk of CPR-related injuries, such as cracked ribs. A study conducted by researchers from University Hospital La Paz, Madrid, Spain, examined the effect of deeper chest compressions on neurological outcomes, and the rate of CPR-related injuries, and their association with prognosis, in people who had cardiac arrest.

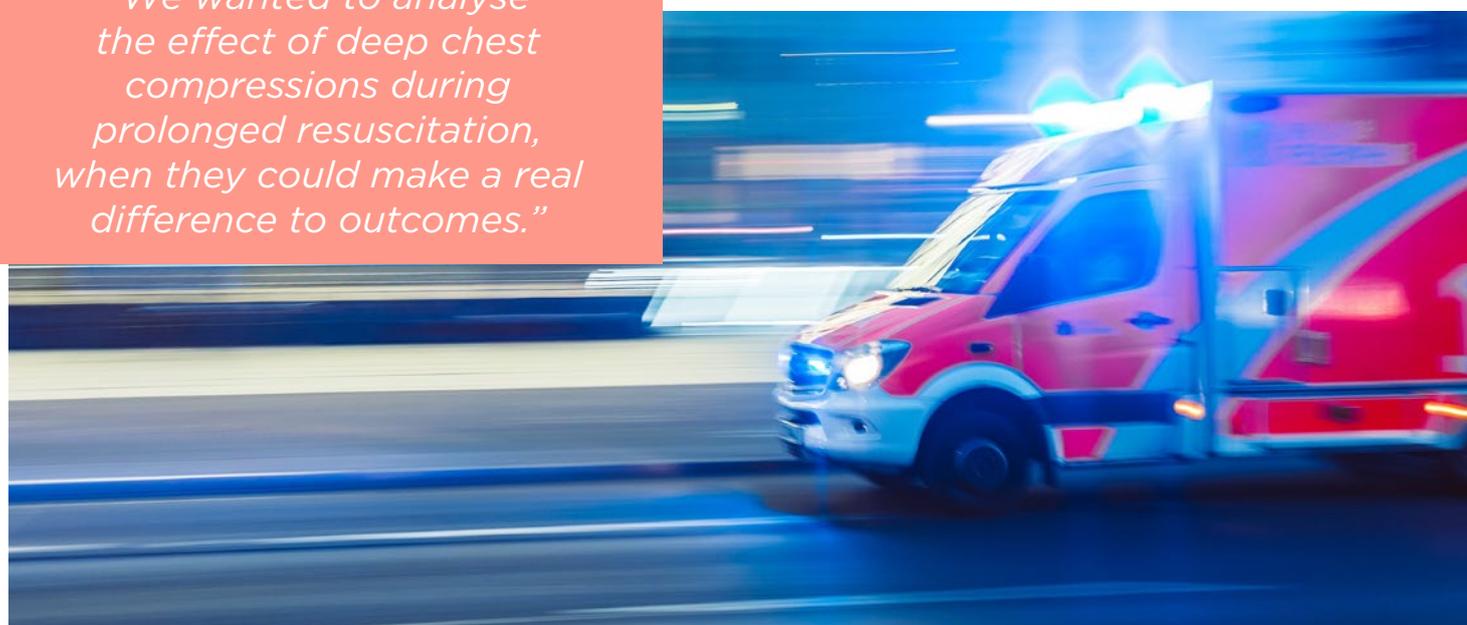
The study included 510 patients who survived cardiac arrest and were admitted to hospital while unconscious between 2006 and 2020. The patients, with an average age of 63 years and of whom 81% were male, were designated into groups for CPR guideline updates: 2006–2010, 2011–2015, and 2016–2020.

Those who would have received prolonged resuscitation and were now comatose survivors were included in the study whereas individuals

who had regained consciousness after the cardiac arrest are likely to have received an immediate electric shock and only brief chest compressions to restore circulation. “We wanted to analyse the effect of deep chest compressions during prolonged resuscitation, when they could make a real difference to outcomes,” said Dr Irene Marco Clement, study author.

After 2010, the researchers found a higher proportion of CPR-related injuries: 12.7% in 2006–2010, 23.5% in 2011–2015, and 22.7% in 2016–2020. Brain performance at 3 months significantly increased over the course of the study (in the later years) and patients with CPR-related injuries were more likely to have better brain performance. Almost two-thirds (65.1%) of patients with injuries had high brain function compared to 43.2% without injuries, the most common of which were rib or sternal fractures. CPR by the public and the use of automated external defibrillators observably increased throughout the study and more than half of the patients survived and were discharged from the hospital. Marco Clement confirmed the results of the study: “Survival and neurological outcome improved significantly during the 14-year study. Injuries from CPR rose, but these patients were less likely to have brain damage.”

“We wanted to analyse the effect of deep chest compressions during prolonged resuscitation, when they could make a real difference to outcomes.”



Influenza and Pneumonia Vaccinations Contribute to Decreased In-Hospital Morbidity in Patients with Heart Failure



“Our study provides further impetus for annual immunisations in patients with heart failure.”

RESPIRATORY infections such as influenza and pneumonia increase the severity of heart failure, an already debilitating disease resulting in fluid build-up in the lungs, shortness of breath, and coughing. According to a recent study presented at ESC Congress 2020 in a press release on 28th August, influenza and pneumonia vaccinations are associated with fewer hospital deaths in patients with heart failure.

It is estimated that 26 million people are affected by heart failure worldwide and that one in five will develop heart failure during their lifetime. Study author, Dr Karthik Gonuguntla of the University of Connecticut, Storrs, Connecticut, USA, noted that: “The COVID-19 pandemic has shone the spotlight on the importance of vaccination to prevent respiratory infections, particularly for people with diseases like heart failure,” prompting the conduct of this study. While it is known that infections exacerbate heart failure, and that inoculations protect against respiratory infections, not many studies have investigated the outcomes of vaccinations in heart failure patients.

The study utilised data from the National Inpatient Sample (NIS), covering >95% of the USA population, and included 2,912,137 patients with heart failure who were admitted to hospital between 2010 and 2014. Analysis showed that 1.4% of the patients were inoculated against the flu and 1.4% against pneumonia. To assess the correlation between vaccination and morbidity, the researchers compared in-hospital death rates between heart failure patients who had received flu and pneumonia vaccinations that year to those that were not vaccinated.

Results showed that the rates of in-hospital mortality were significantly lower in patients who received the flu vaccine compared to those that did not (1.3% versus 3.6%, respectively). Equally, patients inoculated against pneumonia had lower rates (1.2%) compared to those who were not inoculated (3.6%). In conclusion Dr Gonuguntla stated: “Our study provides further impetus for annual immunisations in patients with heart failure. Despite advice to do so, uptake remains low.” He further suggested that: “Pneumonia and flu vaccines are vital to preventing these respiratory infections and protecting patients with heart failure. Although many people have rejected common and safe vaccines before COVID-19, I am optimistic that the pandemic has changed perceptions about the role of immunisations in safeguarding our health.”



Not All Vegetarian Diets are Linked to Improved Cardiovascular Health

PLANT-BASED foods have been shown to improve health status, but a recent study by authors from Harokopio University, Athens, Greece have found that not all diets that limit animal-based products are linked to better heart health. These findings were reported in a press release from the ESC Congress 2020, dated 27th August 2020.

The prospective study, which ran between 2001-2012, analysed 1,528 females and 1,514 males who were free of cardiovascular disease and metabolically healthy obese. The participants were divided into two groups; those who ate a 'healthful' diet which incorporated an increased consumption of fruits/vegetables, whole grains, nuts, legumes, oils, and tea/coffee, compared to those who ate an 'unhealthful' diet of juices, sweetened beverages, refined grains, potatoes, and sweets.

At 10-year follow-up, 54% of females and 45% of males who were previously metabolically healthy participants were regarded as metabolically

unhealthily obese. Indices of the plant-based diet quality found that those who adhered to the healthful plant-based diet had a higher retention of their metabolically healthy status, with a greater significance observed in females.

Unhealthier plant-based food choices were linked to developing higher blood pressure, blood lipids, and blood sugar, again with a greater association seen in females.

Dr Matina Kouvari, first author of the study, suggested that the reason for the increased association in females is because they are more likely to eat less animal products than males. She also noted that participants were classified as obese and so these results should not be extrapolated to include other weight categories.

Dr Kouvari concluded that: "Eating less meat is beneficial for heart health, particularly when it is replaced with nutritious plant foods such as whole grains, fruits, vegetables, nuts, and olive oil."

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Could Saliva Diagnose a Heart Attack?

RAPID diagnosis of heart attack by using saliva to detect troponin released by myocardial injury may soon be a clinical reality, following research presented in an abstract at the ESC Congress 2020 and in a press release dated 26th August 2020.

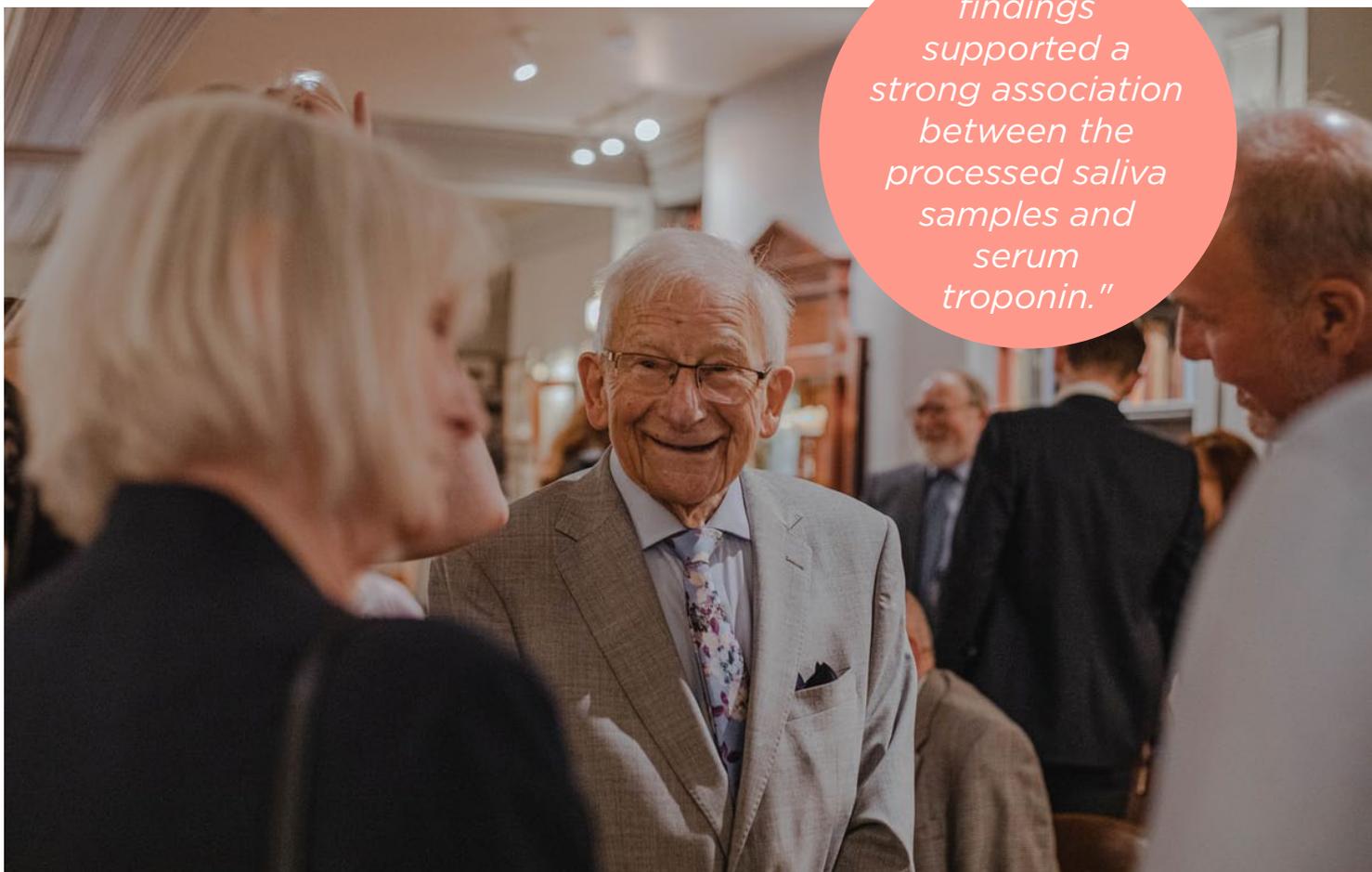
Diagnosis of heart attack is usually dependent on symptomology, electrocardiogram (ECG) evidence, and raised troponin levels upon blood testing, which can take up to an hour for a laboratory to confirm. Researchers from Soroka University Medical Centre, Beer Sheva, Israel, studied the ability for adapted commercially available tests to detect elevated troponin in the saliva of patients at the time of myocardial injury.

Comparing 32 patients with serum evidence of raised troponin to 13 healthy volunteer controls, the researchers collected saliva samples by asking participants to spit into a tube. Half of each sample was tested unprocessed while the other half was processed prior to testing. The findings supported a strong association between the processed saliva samples and serum

troponin. For those patients with raised serum troponin, 84% of the processed samples tested positive for troponin, compared to 6% of the unprocessed samples. None of the samples, both processed and unprocessed, tested positive for troponin among the healthy volunteer participants.

Dr Roi Westreich, Soroka University Medical Centre, discussed the future research plans for the saliva testing: "Further research is needed to determine how long troponin stays in the saliva after a heart attack. In addition, we need to know how many patients would erroneously be diagnosed with heart attack and how many cases would be missed." Dr Westreich is optimistic about the future value of this rapid testing strategy and prototype testing of specialised tests for detecting troponin in saliva: "It will be calibrated to show positive results when saliva troponin levels are higher than a certain threshold and show a yes/no result like a pregnancy test."

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People with ‘Sudden’ Cardiac Arrest Show Increased Contact with Doctors

LETHAL ‘sudden’ cardiac arrest, the third leading cause of death worldwide, is said to have been reported by more than half of patients during the 2 weeks before the event. This is according to the results of a new study presented as part of a press release dated 25th August at the ESC Congress 2020.

On average, less than 10% of people survive from sudden cardiac arrest if left untreated and it is very important to identify who may be at risk. “This is very challenging since these are considered sudden and unexpected events. But our study indicates that patients felt unwell in the days leading up to the cardiac arrest,” said study author Dr Nertila Zylyftari, Copenhagen University Hospital Herlev and Gentofte, Hellerup, Denmark.

The novel study investigated contact with general practitioners (GP) and hospitals in the 1 year prior to cardiac arrest, studying each week to assess contact variation. The Danish Cardiac Arrest Registry was used to identify a total of 28,955 people who had an out-of-hospital cardiac arrest between 2001 and 2014, of which

67% were male and the average age was 72 years. There was relative consistency between patient-GP contact during the year until 2 weeks before the event when contact reached 54%, showing an increase of 28% compared to previous weeks. Compared to patients, just 14% of the overall population in Denmark, who patients were matched to by age and sex, contacted their GP in that year. The researchers found that contact by patients with hospitals also peaked at 2 weeks before cardiac arrest.

This study showed that proportionally, patients contacted their GP more every week for a year before cardiac arrest compared to the matched population in the same year. The researchers did not assess the reasons why cardiac arrest patients sought medical advice. Zylyftari commented on the direction needed following this study: “More data and research are needed on the reasons for these interactions, for example symptoms, to identify warning signs of those at imminent danger so that future cardiac arrests can be prevented.”



“On average, less than 10% of people survive from sudden cardiac arrest if left untreated and it is very important to identify who may be at risk.”



Can Yoga Reduce the Burden and Symptoms of Atrial Fibrillation?

YOGA and breathing have been linked with improved symptoms in patients with atrial fibrillation (AF), according to research presented in a press release dated 24th August 2020 at ESC Congress 2020.

AF, the most common heart rhythm disorder, causes 20–30% of all strokes and increases the risk of morbidity 1.5-fold in males and 2.0-fold in females. Its development has a prevalence of one in four in middle-aged adults in Europe and the USA. It also greatly diminishes the quality of life in patients and 10–40% of these patients are hospitalised each year. “The symptoms of AF can be distressing. They come and go, causing many patients to feel anxious and limiting their ability to live a normal life,” stated study author Dr Naresh Sen, HG SMS Hospital, Jaipur, India. Symptoms include palpitations, racing or irregular pulse, shortness of breath, tiredness, chest pain, and dizziness.

In their study, Dr Sen and his team investigated whether yoga would improve symptoms in patients with AF and therefore recruited 538 volunteers in 2012 to 2017. For 12 weeks the patients did no yoga and then for 16 weeks attended 30-minute yoga sessions every other day and

therefore served as their own controls. During the yoga period, patients were also encouraged to practice the learned movement and breathing techniques daily at home. Symptoms and episodes of AF were recorded in a diary, heart rate and blood pressure were measured, and some patients wore heart monitors to verify AF episodes. Anxiety and depression surveys and questionnaires assessing the patient’s energy levels and mood and the ability to socialise and conduct everyday activities were also completed by each patient.

After comparing the outcomes between the yoga and non-yoga period, the results highlighted that during the 16-week yoga period, patients experienced significant improvements in all areas compared to the 12-week non-yoga period. This was exemplified by the fact that during the yoga period patients experienced an average of eight symptomatic AF episodes compared to 15 in the non-yoga period. Additionally, the average blood pressure was 11/6 mmHg lower after yoga training. These results validate the ability of yoga practice to reduce patient-reported AF symptoms and statistically impact quality of life, physical function, depression, and anxiety devoid of side effects from medication or cardiac ablation.

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