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HEART CONGRESS 2026

4TH EDITION OF INTERNATIONAL HEART CONGRESS

JUNE 22-24, 2026
BARCELONA, SPAIN

Hotel Alimara
Carrer de Berruguete, 126,
Horta-Guinardó, 08035 Barcelona, Spain

4TH EDITION OF

INTERNATIONAL HEART CONGRESS

HYBRID EVENT

22-24 JUNE 2026

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Welcome Message

Ahdy Wadie Helmy

Indiana University School of Medicine, United States

My dear colleagues, professors and trainees, it will be my honor and pleasure to join you in what's appear to be a reputable and rich scientific feast.

As you all know cardiovascular disease has been and still the prime cause of adults mortality worldwide.

I am daring to take you on an exciting journey. Delving into the breaking through and novel approaches to loosen the grip of dyslipidemia as a critical risk for arterial occlusion and endothelial demise.

From manipulating particles receptors at the molecular level to silencing genes, we'll embark together on what's new and in the pipeline of cholesterol and triglycerides treatments.

Welcome Message

Federico Benetti

Benetti Foundation, Argentina

This congress is of great importance, as it highlights significant advancements that are not yet widely known but have the potential to substantially improve the cost-benefit ratio in managing the leading cause of death globally.

Bringing these issues to the attention of the scientific community as early as possible is a key step toward that goal. The exchange of knowledge and collaboration fostered at this event will undoubtedly accelerate the integration of new strategies and innovations into clinical practice.

We look forward to meaningful discussions that will contribute to better outcomes in cardiovascular health worldwide.

Welcome Message

Prof. Dr. Miroslav Radenkovic

Faculty of Medicine–University of Belgrade, Serbia

Dear Colleagues,

Dear scientists and congress visitors, it is an honor and a pleasure to write a few welcome notes in regard to the forthcoming"4th Edition of International Heart Congress". The variety of scientific sessions covering important preclinical and clinical pathological issues will provide new knowledge, as well as novel preventive, diagnostic, and therapeutic opportunities for further state-of-the-art development in cardiology. Moreover, this dynamic event will provide an opportunity for healthcare professionals to discuss their own groundbreaking advancements, as well as everyday clinical challenges in providing high-quality healthcare options, and preserving our patients' wellbeing. Your knowledge and experience will be truly appreciated and we would be thrilled if you could join us. This event will without any doubt foster further cooperation. Welcome!

Welcome Message

Dr. Sergey Suchkov MD, PhD

N.D. Zelinskii Institute for Organic Chemistry of the Russian Academy of Sciences, Russian Federation

Dear Colleagues, Scientists, Practitioners, and Friends,

It is our great pleasure for us to invite you to the "4th Edition of International Heart Congress (Heart Congress 2026)", a global gathering dedicated to advancing heart care and research, which is scheduled to be hold from June 22–24, 2026 in historical and attractive city of Barcelona, Spain.

Advances in systems and synthetic biology, design-inspired and biointerface-driven engineering, and clinical and translational research and translational applications in the area of Personalized and Precision Cardiology (PPC) are beginning to transform the traditional cardiology-related practice landscape into multidimensional and transdisciplinary one. In this context, this Conference would serve as a transdisciplinary platform for esteemed cardiologists, cardiac researchers, healthcare professionals, biodesigners and bioengineers, and bioindustry leaders to convene and exchange groundbreaking ideas.

This Grand Event is a premier event dedicated to exploring the latest advancements and innovations in cardiology, cardiac surgery, cardiac rehabilitation, and to thus featuring Keynote and Plenary lectures by globally respected experts, innovative scientific sessions tailored to different regions and cardiac challenges, and poster presentations highlighting the transformative trends of PPC. This prestigious Conference will bring together leading and highly experienced cardiologists, researchers, educators, and healthcare professionals from around the world. By uniting a diverse audience of profiled experts and healthcare professionals, researchers, and bioindustry pioneers, the Conference serves as a particular catalyst for productive collaboration, building strategic alliances and securing knowledge exchange. As a phenomenal result, you might taste cardiology-related practice-changing science, design-driven and cutting-edge biotechnologies, and shocking innovations that will upload with upgraded intellectual resources, energize and inspire you, directly enriching your research or practice with unique take-home knowledge.

This Conference offers numerous benefits that contribute to both professional and personal growth. One of the most significant advantages is the opportunity to network with researchers, biodesigners, scholars, and bioindustry professionals from around the world. The next-generation cardiologists are about to start up playing a unique role in developing and implementing OMICS-and genomic profiling tests, molecular imaging, heart failure management and preventive protocols at subclinical and clinical stages. As well as in making the appropriate and evidence-based clinical decisions and pre-selecting the best combinatorial preventive, therapeutic or rehabilitative multi-targeted approaches, and communicate the results and their relevance with most of the practitioners and researchers. These interactions can lead to future collaborations, mentorship, and even career opportunities. Whether you are a returning attendee or new to our community, now is the perfect time to join the Conference and be part of something extraordinary, since it is a genuine opportunity to engage with world-renowned experts, explore groundbreaking research, and connect with professionals from every corner of the globe.

Personally, I am convinced that the international partnership and collaboration would play a promoting role for the jointly set projects from any points of view. We do hope that your interaction with your colleagues from many different countries will stimulate a creative exchange of ideas and will be personally rewarding.

Warmest and productive wishes and hope to meet and to see you soon in Barcelona!

Welcome Message

Syed Raza

Awali Hospital, Bahrain

Distinguished Colleagues, Honored Guests, and Dear Participants,

A warm welcome to the Heart Congress 2026 where we will gather as a community bound by a shared mission: To advance heart health through science, collaboration, and compassionate care. During this congress, you will explore cutting-edge research, innovative therapies, and practical approaches to prevention, diagnosis, and treatment. Let us celebrate the pioneers who laid the foundations of modern cardiology and those who continue to push the boundaries today.

This event is more than a program of sessions; it is a platform for mentorship, dialogue, and partnership across disciplines and borders. I encourage you to engage actively, question boldly, and network generously. May the insights you gain here translate into better outcomes for every patient who entrusts us with their heart.

Thank you for your commitment, your curiosity, and your collegial spirit. Welcome, and may the conference be transformative.

Welcome Message

Thomas J. Webster, Ph.D

Hebei University of Technology, China

Dear Colleagues and Friends,

Welcome to Heart Congress 2026!

Without a doubt, recent advances in heart research have revolutionized cardiovascular medicine. But, how did this occur? Was your research part of these advancements? Have we innovated and commercialized such research enough? Are companies paying attention to this wonderful research? Are Universities helping you? What about your federal funding agencies? And, most importantly, are you in the right environment to innovate and commercialize your research? In my own experience, above all else, it takes a supportive environment. Find the right community. Find this conference.

I left the very negative, ultra-competitive, stifling Northeastern University in Boston over 5 years ago. I have never seen such negative, cut-throat, and miserable people in my 25year career! Only after I moved did I find a truly supportive environment that allowed me to form over a dozen companies and yes, I found truly supportive people who value me and my contributions. Because I left Northeastern University, I have since commercialized my nanotechnology research into medical devices now in over 45,000 patients with no failures, only success!

So, I encourage everyone to find that right environment. Make that move. And attend the right conferences: Heart Congress 2026 is such a conference where you will meet the right people! And be inspired, not discouraged like I was at Northeastern University for far too long! I and the patients I have helped wish we could get those years back!

It will change your life once you make the commitment to surround yourself with positive people. I know, because I lived it.

I look forward to seeing everyone to further share my story and give you that “positive” boost!

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About
Magnus Group

About

Magnus Group, a distinguished scientific event organizer, has been at the forefront of fostering knowledge exchange and collaboration since its inception in 2015. With a steadfast commitment to the ethos of Share, receive, grow, Magnus Group has successfully organized over 200 conferences spanning diverse fields, including Healthcare, Medical, Pharmaceutics, Chemistry, Nursing, Agriculture, and Plant Sciences.

The core philosophy of Magnus Group revolves around creating dynamic platforms that facilitate the exchange of cutting-edge research, insights, and innovations within the global scientific community. By bringing together experts, scholars, and professionals from various disciplines, Magnus Group cultivates an environment conducive to intellectual discourse, networking, and interdisciplinary collaboration.

Magnus Group's unwavering dedication to organizing impactful scientific events has positioned it as a key player in the global scientific community. By adhering to the motto of Share, receive, grow, Magnus Group continues to contribute significantly to the advancement of knowledge and the development of innovative solutions in various scientific domains.

About
Heart Congress 2026

About

The **4th Edition of the International Heart Congress (Heart Congress 2026)** will be held from **June 22–24, 2026,** in **Barcelona, Spain**, **and virtually,** offering a hybrid platform that promotes global participation, collaboration, and accessibility. Centered on the theme, **"Heart Health at the Forefront: Innovations, Care, and Prevention,"** the congress will bring together leading cardiologists, cardiovascular researchers, clinicians, healthcare professionals, academicians, and industry experts from around the world to exchange knowledge, share research findings, and discuss the latest advancements in cardiovascular medicine.

The scientific program encompasses a wide range of contemporary topics, including preventive cardiology, digital health and artificial intelligence in cardiology, inherited and genetic cardiovascular disorders, heart failure, interventional cardiology, cardiac imaging, cardio-oncology, cardiovascular surgery, and population-based approaches to heart disease prevention and management. Through keynote lectures, plenary sessions, oral and poster presentations, participants will gain valuable insights into the latest developments shaping the future of cardiovascular care.

In addition to its scientific excellence, the congress offers extensive networking opportunities that foster international partnerships, multidisciplinary collaboration, and professional development. By bridging cutting-edge research with clinical practice, **Heart Congress 2026** aims to inspire innovation, encourage knowledge exchange, and contribute to improved cardiovascular outcomes across diverse healthcare settings.

Whether attending in person or virtually, participants will benefit from a dynamic and engaging scientific environment dedicated to advancing heart health and shaping the future of cardiovascular medicine.

About
CPD Accreditation

About

Continuing Professional Development (CPD) credits are valuable for Heart Congress 2026 attendees as they provide recognition and validation of their ongoing learning and professional development. The number of CPD credits that can be earned is typically based on the number of sessions attended. All the participants have an opportunity to avail 1 CPD credit for each hour of Attendance.

Some benefits of CPD credits include:

Career advancement: CPD credits demonstrate a commitment to ongoing learning and professional development, which can enhance one's reputation and increase chances of career advancement.

Maintenance of professional credentials: Many professions require a minimum number of CPD credits to maintain their certification or license.

Increased knowledge: Attending Heart Congress 2026 and earning CPD credits can help attendees stay current with the latest developments and advancements in their field.

Networking opportunities: This Conference provide opportunities for attendees to network with peers and experts, expanding their professional network and building relationships with potential collaborators.

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KEYNOTE PRESENTATIONS

Ahdy Wadie Helmy MD, PhD, FACP

Associate Professor of Medicine Endocrinology & Metabolism Diplomat of Clinical Lipidology, Indiana University School of Medicine, Indiana, Indianapolis, USA

Biography: Dr. Helmy graduated from Alexandria University School of Medicine, did his first residency in Internal Medicine. Earned his Master Degree then PhD. Moved to the USA, did another Internal Medicine Residency at Indiana University, then a fellowship in Endocrinology & Metabolism at Indiana University. Became board certified in Internal Medicine, then Endocrinology, and had his 3rd board in Clinical Lipidology. Championed the establishment of the first advanced lipid testing and lipid clinic at The VA Medical Center at Indianapolis which is a part of Indiana University Medical center. He is an author, a clinician and a prolific teacher who earned numerous teaching award. A national and international speaker in multiple endocrinology topics mostly lipids, Metabolic Syndrome, Diabetes, and testosterone replacement.

Fats of life, the skinny on novel lipid therapies beyond statins

With Cardiovascular disease still the primary killer of adults globally, tackling lipid disorders has proven extremely useful from the statins experience since the early nineties. However, goals are not met regarding the lipid parameters for the vast majority of the world adult populations, for both those who sustained ASCVD, and those heading to a similar outcome.

Many, didn't achieve goals with the maximum tolerated statins dose. Others couldn't tolerate statins. Many others experienced the nocebo effect creating a barrier to reach goals using the least expensive tools.

I try in this presentation highlighting some clinical pearls from my experience as a lipid clinic founder and a practicing lipidologist in a major tertiary academic center in using statins, and overcoming common barriers, including debunking common myths, and unfounded fears.

I also discuss alternatives, newer modalities, both approved, and those novel tools in the pipeline. Elaborating on their mechanisms, using them with what we have to create the ideal CV outcome to our patients.

I also address in this presentation a common mistake unfortunately done by patients and some providers in stopping lipid lowering agents suddenly. I will elaborate on the acute phase transition of cholesterol and cholesterol crystals and what experts are warning of especially in light of new imaging techniques focusing on the plaques composition and structure.

Federico Benetti MD

Benetti Foundation, Argentina

Biography: Prof. Dr. Benetti is President-Director and Chief of Cardiac Surgery of the Benetti Foundation Rosario Argentina from 1991 P, Director Emeritus Minimally Invasive Cardiac Institute, Miami Heart Institute and Medical Center, Miami, Florida, 1998-2000 publications 128 books Chapters 10 Lectures Conferences Live Conferences 1000, Internationals Awards Prizes 20 Honorary Member Internationally Society's 5. Dr. Benetti did his first off pump coronary surgery in 1978 In Argentina in 1990 describes his surgical technique for fibroses interventricular septum. In 1994 perform for the First time in the world the MIDCAB operation, in 1996 the first Mitral valve replacement Minimally invasive with 3D In 1997 describe the Aortic valve replacement using 3 d through the Right Anterior Thoracotomy In 1997 perform the First Ambulatory Coronary Bypass in The World Through the XIPHOID Approach (MINI OPCAB)Trained surgeons in 45 countries of the world in Off Pump Techniques He Hold 31 US PatenTS of Technology and 2 Method Patents the MIDCAB and The Xiphoid Approach. Actually, he practices in the Benetti Foundation Rosario.

Historical evolution from OPCAB to MIDCAB to mini OPCAB surgical technique and results

Between 1970 and 1980 there were experiences and series of patients operated on direct coronary surgery without the use of extracorporeal circulation. During the 80 and 90 the Technique was developed. The MIDCAB was the one that promoted the development of coronary surgery without extracorporeal circulation and the creation of the initial technology for the posterior universalization of the OPCAB technique. Today is a standard operation all over the world with thousands of patients done every day in October 1997, using 3D video we performed the first ambulatory coronary surgery in the world; we call this technique the xiphoid approach because in most patients we must open the lower part of the sternum to be able to perform the operation, we call it the MINI OPCAB technique surgical technique.

The patient is prepared for standard coronary bypass operation through sternotomy The sternum is opened to the 3 o 4 intercostal space depending on the anatomy A retractor is put in place, the patient is heparinized as a normal OPCAB patient 3mg/KG The left arm of the retractor is elevated; the left mammary is dissected around 8cm and isolated without the veins Importantly, the angle of the superior part where the mammary is attached to the sternum, needs to be below 20% to avoid any potential kinking In a case of multiple vessels

the right side of the retractor is elevated and the left arm put in a normal position and the right mammary artery is dissected the longitude depends of the numbers of grafts and localization to be performed is the right is use as inflow to a vein or a radial artery to perform the distals anastomosis, or the entire right mammary alone.

Results: The mortality was 0%.70 Patients receive anastomoses of the LITA to LAD (100%) and 8 multiples grafts with an average of 2, 2 grafts per patient.

Conclusion: More experience is needed and new and better technology to spread this technique worldwide.

Mekhman N Mamedov*, Akhundova Kh. R.

National Medical Research Center for Therapy and Preventive Medicine, Moscow, Russian Federation

Biography: Dr. Mamedov was born on January 10, 1970, in Sheki, Azerbaijan, and is a distinguished Azerbaijani cardiologist based in Moscow, Russia. He completed his medical education at the Moscow Medical Academy named after I.M. Sechenov, followed by postgraduate and doctoral studies in cardiology at the National Research Center for Preventive Medicine. Since 2002, Dr. Mamedov has led the Department of Secondary Prevention of Chronic Non-infectious Diseases at the National Research Center for Therapy and Preventive Medicine. His research focuses on cardiovascular disease epidemiology, risk factors, and pharmacotherapy. Dr. Mamedov has authored 468 articles, 13 monographs, and holds a Hirsch index of 40. He serves as the President of the Cardioprogress Foundation, is on the board of the Russian Society of Cardiology, and is Editor-in-Chief of the International Journal of Heart and Vascular Diseases.

Analysis of cardiovascular risk factors in patients with type 1 diabetes mellitus

Aim: To analyze the characteristics of Risk Factors (RF) for Cardiovascular Disease (CVD) in individuals with type 1 diabetes mellitus.

Materials and Methods: This cross-sectional multicenter study included 453 male and female patients with a verified diagnosis of type 1 diabetes mellitus, aged 35-65 years, from 14 Russian cities. Patient recruitment was conducted from June 2024 to February 2025. A total of 427 patients (238 men and 189 women) completed the study. Patient examination included a medical examination, completion of a questionnaire adapted by the National Medical Research Center for Therapy and Preventive Medicine, instrumental examinations (measurement of blood pressure, resting heart rate, anthropometric parameters, including BMI calculation and waist circumference measurement, resting electrocardiography), and assessment of blood biochemistry parameters, including lipid profile.

Results: The average age of men with type 1 diabetes was 42.6±10.3 years, while that of women was 40.9±10.5 years. At the time of diagnosis, the average age of men was 27.2±10.3 years, while that of women was 22.4±11.1 years. Every second patient, regardless of gender, had a nutritional disorder, including impaired intake of table salt, fats, and refined carbohydrates. Despite the young age of the patients, every third one leads a sedentary lifestyle. Hypercholesterolemia in men with type 1 diabetes was detected in 65.1% of cases, while among women this figure

was 60.8%. Among men with type 1 diabetes, arterial hypertension was detected in 28.6% of patients, while among women it was 37.6%. Abdominal obesity was recorded in 23.9% of men with type 1 diabetes, compared to 33.9% of women (p=0.03). According to the survey, 46.2% of men with type 1 diabetes were subject to moderate to high levels of chronic stress, while 61.4% of women reported chronic stress (p=0.002).

Conclusion: Managing cardiovascular risk in individuals with type 1 diabetes requires, in addition to effective glycemic control, monitoring key behavioral and biological risk factors for CVD.

Prof. Miroslav Radenković MD, MS, PhD

Department of Pharmacology, Clinical Pharmacology and Toxicology, Faculty of Medicine, University of Belgrade, Belgrade, Serbia

Biography: Miroslav Radenkovic MD, MS, PhD, a full-time professor at the Department of Pharmacology, Clinical Pharmacology and Toxicology, graduated from the Faculty of Medicine–University of Belgrade (FMUB) in 1995, and from 1996 he is working at the FMUB. Dr. Radenkovic received an MS from pharmacology, board certified in Clinical Pharmacology, PhD from Medical Sciences, and a sub-specialization degree in Clinical Pharmacology-Pharmacotherapy in 1999, 2000, 2004, and 2016 respectively, from the FMUB, as well as Bioethics MS in 2021 from the Clarkson University, NYC, USA. From 2002 Dr. Radenkovic officially participated in several scientific projects supported by the Ministry of Science-Serbia; the Austrian Science Fund; COST Action; as well as the NIH Fogarty International Center Project, USA. Dr. Radenkovic is a member of the Ethics Board of Serbia and a Chair Department.

Pharmacological advancement in Pulmonary Arterial Hypertension (PAH) treatment – Contribution of treprostinil dry-powder formulation

Pulmonary Arterial Hypertension (PAH) is still a devastating illness with substantial morbidity and death outcomes. Taking into account that the disease advances quickly for many patients, and is commonly associated with severe clinical symptoms, new treatment options are still required. Treprostinil, a prostacyclin analog in a form of inhalation powder, was recently approved by the FDA for adults with Pulmonary Arterial Hypertension (PAH, WHO Group 1) and Pulmonary Hypertension associated with Interstitial Lung Disease (PH-ILD, WHO Group 3) to improve exercise ability. This is the first-in-class prostacyclin dry-powder formulation, which yields uniform, free-flowing particles designed to enhance deep-lung delivery via an easy-to-use, low-effort device requiring less inspiratory effort. The approval of treprostinil dry-powder was primarily based on findings from the phase 3 INSPIRE trial, which evaluated patients who were naive to treprostinil, as well as those transitioning to new formulation from nebulized treprostinil. Treprostinil dry-powder was shown to be safe and well-tolerated regardless of a patient's previous exposure to treprostinil, thus providing a new quality in treatment of PAH and PH-ILD, especially in patients with limited inspiratory flows or lung capacity. Given the previous facts, the main objectives of this presentation will be to clarify the pharmacological properties of treprostinil dry-powder, including pharmacodynamics, pharmacokinetics, indications, and contraindications for use, adverse drug reactions, as

well as the most important drug interactions. This will provide a better understanding of this first-in-class dry-powder formulation for PAH, consequently helping clinicians in its suitable prescribing and adequate clinical use.

Dr. Narendra Kumar

HeartbeatsZ Academy, United Kingdom

Biography: Dr. N. Kumar is a European Board Certified Cardiac Electrophysiologist (ECES) with his doctorate thesis on AFib ablation from Maastricht. He is also a program chair for an International cardiology program and a visiting professor of cardiology for EDU (Germany, Malta). The primary interests of Dr. N. Kumar are atrial fibrillation, complex cardiology, and cardiovascular economics. He has extensive experience with ablation and complex devices with >70 publications (and >600 citations) in reputed journals, including JACC and Heart Rhythm Journal. He has received several prestigious awards, including the Erasmus Scholarship in 2015 and the NRI of the Year Award in 2018 for academics by the Times Group. In 2018, he was awarded a scholarship by the American Heart Rhythm Society for advanced heart arrhythmia training at St. Luke's Medical Center in the USA, followed by the American College of Cardiology Travel Award in 2019 and the EHRA Educational Grant in 2021. In 2023, he was honored at the UK Parliament with the India UK Achievers Honours for his contributions to science, education, and innovation. He has undergone training at some of the leading hospitals across the USA, UK, Germany, and the Netherlands. Dr. N. Kumar is a fellow of 1] Royal College of Physicians, Edinburgh (FRCP), 2] European Society of Cardiology (FESC), 3] American College of Cardiology (FACC), 4] Indian College of Cardiodiabetology and Metabolic Disease (FICCMD). His Two papers, including the "ATSCA study," have been referenced in the 2017 expert consensus on atrial fibrillation ablation guidelines. Dr. N. Kumar has also worked as a reviewer for journals such as The Lancet and a global consultant for various studies such as Discovery, Painfree-sst, and ImproveSCA. He graduated from the London School of Economics in Health economics and cardiovascular management and is also responsible for approving the "World's first catheter for epicardial ventricular tachycardia ablation" from TGA for Abbott (USA).

Beyond PCSK9: The next wave of lipid-lowering and thrombosis prevention-From bench to breakthrough

In 2015, we celebrated PCSK9 inhibitors. In 2026, we're potentially approving FOUR revolutionary drug classes simultaneously. But will they succeed where others failed?"

First, we examine Factor XI/XIa inhibition as a strategy to uncouple thrombosis from haemostasis, highlighting key phase II–III programmes in atrial fibrillation and atherothrombotic disease and their potential to redefine long-term anticoagulation in patients at high bleeding risk.

Second, we discuss aldosterone synthase inhibition as a more selective approach to renin–angiotensin–aldosterone system modulation, with implications for resistant hypertension, heart failure, and cardiorenal protection, where current mineralocorticoid receptor antagonists are limited by hyperkalaemia and off-target effects.

Third, we review nucleic acid–based and siRNA therapies targeting Lp(a) and angiotensinogen, which promise durable, infrequent dosing and powerful risk modification in genetically determined dyslipidaemias.

Fourth, we revisit CETP inhibition in light of obicetrapib and other agents that, unlike earlier compounds, appear capable of lowering LDL-C and apolipoprotein B while enhancing high-density lipoprotein functionality, potentially translating into event reduction.

- Factor XIa Inhibitors- The anticoagulation safety revolution (milvexian, abelacimab).
- Aldosterone Synthase Inhibitors- Overcoming MRA limitations (vicadrostat, baxdrostat).
- Lp(a)-Targeted Therapies- Finally addressing the 'undrugable' target (pelacarsen 80% reduction, olpasiran >95%).
- CETP Inhibitors Reborn- Obicetrapib learning from past failures.

Conclusion: Position these as complementary, not competing-a patient could theoretically need all four drug classes.

Sergey Suchkov[1-14*], Holland Cheng[16], Matt Springer[17], Trevor Marshall[18]

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[2]China Hong Kong Innovation International Business Association, Hong Kong
[3]InMedStar, Russia
[4]New York Academy of Sciences, USA
[5]EPMA (European Association for Predictive, Preventive and Personalized Medicine), Brussels, EU, Belgium
[6]ISPM (International Society for Personalized Medicine), Tokyo, Japan
[7]PMC (Personalized Medicine Coalition), Washington, DC, USA
[8]AMEE (Association for Medical Education in Europe), Centre for Medical Education, Dundee, Scotland
[9]ACS (American Chemical Society), Washington, DC, USA
[10]AHA (American Heart Association), Dallas, TX, USA
[11]ARVO (The Association in Research in Vision & Ophthalmology), Rockville, MD, USA
[12]ISER (International Society for Eye Research), Anchorage, AK, USA
[13]Secretary General, United Cultural Convention (UCC), Cambridge, UK
[14]The Russian Academy of Natural Sciences, Moscow, Russia
[15]Abe Cancer Clinic, Tokyo, Japan
[16]The College of Biological Sciences, UC Davis, CA, USA
[17]Dept for Cardiology, UCSF, SF, CA, USA
[18]Autoimmunity Research Foundation, Los Angeles, CA, USA

Biography: Sergey Suchkov was born in the City of Astrakhan, Russia, in a family of dynasty medical doctors. In 1980, gradu-ated from Astrakhan State Medical University and was awarded with MD. In 1985, He maintained his PhD as a PhD student of the I.M. Sechenov Moscow Medical Academy and Institute of Medical Enzymology. In 2001, Suchkov maintained his Doctor Degree at the National Institute of Immunology, Russia. From 1989 through 1995, Dr. Suchkov was being a Head of the Lab of Clinical Immunology, Helmholtz Eye Research Institute in Moscow. From 1995 through 2004-a Chair of the Dept for Clinical Immunology, Moscow Clinical Research Institute (MONIKI). In 1993-1996, Dr. Suchkov was a Secretary-in-Chief of the Editorial Board, Biomedical Science, an international journal published jointly by the USSR Academy of Sciences and the Royal Society of Chemistry, UK. At present Dr. Sergey Suchkov MD, PhD, serves as the Director for Center of Biodesign at the N.D. Zelinskii Institute for Organic Chemistry of the Russian Academy of Sciences in Moscow, Russia, Senior Scientific Advisor for the China Hong Kong Innovation International Business Association in Hong Kong and R&D Director at InMedStar in Russia. Member of the Russian Academy of Natural Sciences (Moscow, Russia), the New York Academy of Sciences (USA), the American Chemical Society (ACS, USA), the American Heart Association (AHA, USA), the European Association for Medical Education (AMEE, Dundee, UK), the European Association for Predictive, Preventive and Personalized Medicine (EPMA, Brussels, EU), the American Association for Research in Vision and Ophthalmology (ARVO), the International Society for Eye Research (ISER), and the Personalized Medicine Coalition (PMC, Washington, DC, USA).

Personalized and Precision Medicine (PPM) and PPN-guided cardiology practice as a unique model via translational applications and upgraded business modeling to secure human healthcare, wellness and biosafety

A new systems approach to diseased states and wellness result in a new branch in the healthcare services, namely, Personalized and Precision Medicine (PPM). The pace of innovation in Personalized & Precision Cardiology (PPC) is thus becoming fast including:

(i) The success of transcatheter aortic valve implantation for patients or persons-at-risk at lower levels of surgical risk, or procedures to ablate atrial fibrillation with high degrees of success, and other interventional procedures;

(ii) Global shift from treating disease and preventing the secondary recurrence of cardiovascular events to the primary and even primordial prevention of cardiovascular risk and the promotion of cardiovascular health;

(iii) The widespread advent of wearable and implantable technologies, allowing continuous monitoring of cardiovascular parameters;

(iv) Nanotechnology and microfluidics, AI and related areas to become the most rapidly emerging areas of cardiovascular research and the most promising technologies for improving health care and health outcomes.

A major paradigm shift has become the increasing recognition of the potential therapeutic utility of the targeted drugs for cardiovascular diseases, whilst opening up new avenues of therapeutic implications. As PPM continues to drive targeted immunotherapy development and cardiac biomarker discovery for healthcare services, cardiologists could indeed see their own PPM-based renaissance very soon.

The above-mentioned areas being an integral part of PPM-related cardiac research is really an interdisciplinary field that results from the application of the innovative tools to medicine and has the potential to significantly improve some canonical treatments, prevention, prophylaxis and rehabilitation. Specifically, in the field of PPC, we expect to have a great impact in the near future due to its multiple advantages, namely its versatility to adapt a drug to cohorts of patients and/or persons-at-risk.

PPM and PPC are thus poised to become the next great revolution in the daily practice, as well as in the maintenance of cardiovascular health and the prevention and cure of cardiovascular disease. PPM disrupts standard practice and draws from clinical testing, electronic health records, pan-omics profiling, big datasets, and novel analytical methods, to create a person-specific phenotype to identify an optimal intervention with minimal risk.

The promise of PPM and PPC is well understood but the newest tools will be needed for describing the cardiovascular health status of individuals and populations, including 'omics' data, exposomics and social determinants of health, behaviours and motivations, patient-generated data, and the array of data in EMRs. Cardiology and cardiac micro-and nanosurgery currently lead the way in PPC advancements, and health care under PPM-related ar-

mamentarium will become a more integrated, dynamic system, in which patients are no longer a passive entity on whom measurements are made, but instead are central stakeholders who contribute data and participate actively in shared decision-making.

Encompassing functional cardiology, integrative medicine, and metabolic medicine/cardiology, we would suggest an up-to-date, expert approach to heart health wellness and treating the diseased heart and blood vessels. The proposal would ideally be suited for practitioners who already incorporate integrative approaches in their practice, as well as more traditional clinicians who want to learn more about PPM and PPC as a growing area.

PPM will need to demonstrate that phenotype-based person-specific interventions are superior to the current standard of care and, ultimately, have a population effect by moving the mean on the disease spectrum towards Health. This is the reason for developing global scientific, clinical, social, and educational projects in the area of PPM to elicit the content of the new branch. In short, PPM will transform the way the physicians practice and will shake up the entire pharmaceutical value chain.

Steve Cohen RN, MSN, CHt

Medvesta Hypnosis Healthcare, NSA Illinois, United States

Biography: Steve Cohen is a Keynote Speaker and Healthcare Expert with more than 30 years of experience in the Healthcare fields of Occupational Therapy, Registered Nursing, and Hypnotherapy, Steve helps Healthcare professionals improve their physical and mental health to build better relationships with themselves. Healthcare workers are committed to caring for people. With more patients than ever, they are constantly on their toes and wearing multiple hats. Even when your team seems motivated and upbeat, you know that behind their scrubs and masks, they are human, vulnerable to stress, fatigue, burnout, and anxiety. Many deal with it silently, but imagine giving them new tools to ensure their sanity, protect their empathy, and improve retention.

Movement is medicine

This keynote highlights how movement as medicine supports the goals of the Cardiology World Conference 2026 by emphasizing innovative, preventive approaches to heart health. For cardiologists, cardiovascular surgeons, researchers, healthcare practitioners, academicians, industry experts, and policymakers, the session demonstrates how simple, evidence-based movement strategies can improve cardiovascular function, resilience, and patient outcomes. By connecting movement science with cardiovascular research and clinical practice, it encourages interdisciplinary collaboration and practical solutions that align with the conference theme of "Cardiology Innovation: Shaping the Future of Heart Health." Participants will gain insights into how integrating small, daily movement interventions can support prevention, recovery, and long-term cardiovascular wellness while advancing innovative approaches within modern cardiology.

Dr. Syed Raza MD, MRCP, FRCP, CCT, FACC, FESC, FESCVI

Awali Hospital, Bahrain

Biography: Dr. Syed Raza graduated from Aligarh University in India in 1993. After completing his postgraduate degree in Medicine from the same university, he moved to the UK for higher specialist studies. Dr. Syed Raza successfully completed MRCP and CCT and later also awarded Fellow of the Royal College of Physicians of Edinburgh (FRCP). He was awarded Professor John Goodwin prize for outstanding performance in Diploma Cardiology exam at Hammersmith Hospital, University of London in 2001. Dr. Raza is Fellow of American College of Cardiology and American College of Chest Physicoans. Also Fellow of European Society of Cardiology and Fellow of European Society of Cardiovascular Imaging. He is also on the committee of Acute Cardiovascular Care. Heart Failure and Cardiovascular Imaging (European Society of Cardiology). Currently working as Consultant Cardiologist and Head of the department of Medicine at Awali Hospital, Bahrain. Dr. Raza is a board member of the Hospital Excecutive Committee. Also chairs the Resuscitation committee and Privileging and Credentialing Committee. Prior to this he worked as consultant in Cardiology at Mid Cheshire Hospitals, NHS trust, United Kingdom. Dr. Raza is the regional educational coordinator for RCP Edinburgh and examiner for MRCP exam for the Royal College of Physicians of UK. Has partipcpated in some well known trials and reasearch. Dr. Syed Raza has to his credit numerous publications and he has presented his scietific work in different parts of the world and peer review author for some well respected International journals. He is permanent Review author for abstracts for European Society of Cardiology Annual Congress also the editorial board of International Journal of Endovasculat Treatment and Innovative Techniques. Dr. Raza is a teaching faculty member for Healthcare Management and Leadership at Westford University, Dubai campus. He is certified American Board in Medical Quality. Dr. Raza frequently organises a number of seminars, webinars, symposia and workshop on various healthcare, quality and safety topics. Dr. Raza has led the first awareness campaign in Heart Failure in the Middle East in 2017. He is chairman of BAPCO's health promotion unit. His special interests are Cardiovascular Imaging, Heart Failure and Acute Cardiovascular Care. Dr. Syed Raza is founder and chairman of Raza Foundations which works for educating and increasing awareness on various health related topics amongst the general public as well as provide free healthcare services to poor as one of the charity initiatives.

Novel ways of cardiovascular risk assessment

Cardiovascular Disease (CVD) is the leading cause of death and disability worldwide. The primary prevention of CVD is dependent upon the ability to identify high-risk individuals long before the development of overt events. This highlights the need for accurate risk stratification.

For a number of years healthcare professionals have been using a wide range of traditional methods and tools for assessing and calculating individual's predicted future risk for cardiovascular disease including coronary and cerebrovascular disease. They include taking into account presence of co-morbidities such as Diabetes Mellitus, Hypertension, Dyslipidaemia, smoking and family history. Risk scoring tools such as Framingham and Risk score and also utilization of some basic cardiac investigations. These methods have been useful but we realise that they always do not adequately and accurately predict the cardiovascular risk.

Critical evaluation of risk markers and risk assessment methods have become even more important as novel markers of cardiovascular risk are identified by technological advances in genetics, genomics, proteomics, and non-invasive imaging. They have been shown to evaluate the risk of an individual in more depth than the traditional methods and perhaps also provide insights into the unexplored and hidden risks.

However, these novel methods of cardiovascular risk assessments are costly and not readily available and hence they must be judiciously utilised to provide a more individualized and personalised approach so that this strategy is more cost effective.

Thomas J. Webster

School of Health Sciences and Biomedical Engineering, Hebei University of Technology, Tianjin, China
School of Engineering, Saveetha University, Chennai, India
Co-Founder of Over a Dozen Companies, Mansfield, Bioincubator, Mansfield, MA USA

Biography: Thomas J. Webster's (H index: 132; Google Scholar) degrees are in chemical engineering from the University of Pittsburgh (B.S., 1995; USA) and in biomedical engineering from RPI (Ph.D., 2000; USA). He has served as a professor at Purdue (2000-2005), Brown (2005-2012), and Northeastern (2012-2021; serving as Chemical Engineering Department Chair from 2012 - 2019) Universities and has formed over a dozen companies who have numerous FDA approved medical products currently improving human health in over 30,000 patients. His technology is also being used in commercial products to improve sustainability and renewable energy. Thomas J. Webster is Currently helping those companies and serves as a professor at Brown University, Saveetha University, Hebei University of Technology, UFPI, and others. Dr. Webster has numerous awards including: 2020, World Top 2% Scientist by Citations (PLOS); 2020, SCOPUS Highly Cited Research (Top 1% Materials Science and Mixed Fields); 2021, Clarivate Top 0.1% Most Influential Researchers (Pharmacology and Toxicology); 2022, Best Materials Science Scientist by Citations (Research.com); and is a fellow of over 8 societies. Prof. Webster is a former President of the U.S. Society for Biomaterials and has over 1,350 publications to his credit with over 55,000 citations. He was recently nominated for the Nobel Prize in Chemistry. Prof. Webster also recently formed a fund to support Nigerian student research opportunities in the U.S.

Cardiovascular nanomedicine: Stopping strokes, unclogging arteries, and restoring heart function

Nanomedicine, or the use of materials with at least one dimension less than 100 nm, has led to improved disease prevention, diagnosis, and treatment. This talk will cover recent advances in the use of nanomaterials to prevent, diagnose, and treat cardiovascular diseases. Specifically, nanomaterials (such as carbon nanotubes) when coupled with stem cells have been shown to reverse stroke damage and return motor function to stroke-induced rats. Moreover, vascular stents with nanotextures have been shown to improve endothelialization to reduce thrombus formation and reclogging of arteries. Further, new cardiac patches with conductive nanomaterials (such as graphene) have been shown to regenerate cardiomyocyte functions (such as growth and contractile function) to regenerate healthy cardiac tissue in the area of heart tissue damage due to heart attacks. In this manner, this talk will highlight how cardiovascular nanomedicine is being used to significantly improve numerous cardiovascular diseases in unprecedented ways.

Yangxin Li[1*], Yan Xu[2], Yi Sun[3], Yao-Hua Song[3]

[1]Department of Cardiovascular Surgery of the First Affiliated Hospital & Institute for Cardiovascular Science, Soochow University, Suzhou, P. R. China

[2]Department of General Medicine, the Second Xiangya Hospital, Central South University, Changsha, P. R. China

[3]Fuwai Yunnan Hospital, Chinese Academy of Medical Sciences, Affiliated Cardiovascular Hospital of Kunming Medical University, Kunming, P. R. China

Biography: Yangxin Li received her B.S. from the University of Science and Technology of China and her Ph.D. from the University of Florida, USA. She worked as a Scientist at the Texas Heart Institute (USA) from 2006 to 2013 and has been a full professor at Soochow University since 2013.

CircHIPK3 regulates nucleolin phase separation in aging: Insights from AI-driven prediction and experimental validation

Cardiac aging is closely linked to Cardiomyocyte (CM) senescence. Ribosome biogenesis plays a critical role in triggering CM cell cycle reentry; however, the specific activators and upstream regulators of this process remain unclear. Circular RNAs (circRNAs) have emerged as key regulators in various cardiac physiological and pathological processes. Among them, circHIPK3 has been implicated in maintaining cardiac homeostasis. Nucleolin (NCL), a known regulator of ribosome biogenesis, is proposed to exert its functions through Liquid–Liquid Phase Separation (LLPS), and its activity may be modulated by circHIPK3. In this study, we aimed to investigate whether circHIPK3 mediates its role in cardiac aging through NCLLLPS.

We developed a novel three-stage iterative Artificial Intelligence (AI) framework to predict the LLPS potential of NCL. CM-specific circHIPK3 knockout (CKO) mice were generated, with a lifespan not exceeding 18 months. Using animal models along with RNA pull-down, FRAP, and Ribo-Halo assays, we examined the interaction between NCL and circHIPK3. AI-based analysis revealed that NCL possesses an intrinsic capacity for LLPS, which progressively declines during aging. In murine cardiac tissue, circHIPK3 expression decreased with advancing age. Knockout of circHIPK3 led to cardiac dysfunction, myocardial fibrosis, and multiple aging-related phenotypes, including activation of the p21 signaling pathway. At the molecular level, circHIPK3 directly binds to the 5' Untranslated Region (5'UTR) of NCL mRNA, thereby enhancing NCL mRNA stability and sustaining NCL-dependent LLPS to promote

ribosome biogenesis. Furthermore, overexpression of circHIPK3 in CKO mice effectively restored NCL expression and suppressed the aging-associated p21 pathway.

In conclusion, we identified a novel regulatory axis—the circHIPK3–NCL LLPS–ribosome biogenesis pathway—that protects against cardiac aging via post-transcriptional mechanisms. These findings underscore the pivotal role of circHIPK3 in maintaining cardiac homeostasis during aging and suggest that circHIPK3 may serve as both a biomarker and a therapeutic target for age-related cardiac dysfunction.

Yong-Xiao Wang

Department of Molecular and Cellular Physiology, Albany Medical College, Albany, New York, USA

Biography: Dr. Yong-Xiao Wang has been a Full Professor in Department of Molecular and Cellular Physiology at Albany Medical College since 2006. Dr. Wang obtained his MD, PhD, and postdoctoral training at various week-recognized universities. He has made many important findings using complementary molecular, biochemical, physiological, and genetic approaches at the molecular, organelle, cellular, tissue and organism levels in animals and human samples, had numerous publications in Nature Commun (impact factor: 14.290), Antioxid Redox Signal (8.209), Proc Natl Acad Sci USA (9.432), Nature (34.480), Circ Res (9.214), and other highly peer-reviewed journals and academic books, and served as the editorial board member and/or section editor as well as the executive committee member and/or subcommittee chair for professional societies.

Novel mechanisms and new therapeutics for right heart failure in pulmonary hypertension

Right ventricular remodeling and associated Right Heart Failure (RHF) are common and severe cardiovascular diseases. These diseases often occur in Pulmonary Hypertension (PH). PH and associated RHF are widespread devastating diseases. Their molecular responses and mechanisms remain poorly understanded, and medications are neither always effective nor specific. In a series of recent studies, we have explored the potential important role of Ryanodine Receptor 2 (RyR2) Ca2+ release channel in the development of PH. Moreover, we have also investigated whether its inhibitory blockers and biologics may block this devastating disease. Our findings reveal that Rieske Iron-Sulfur Protein (RISP) serves as a primary molecule to increase mitochondrial Reactive Oxygen Species (ROS) generation, disassociate FKBP12.6 from RyR2, enhance the channel activity, and then induces calcium release from the sarcoplasmic reticulum (a major intracellular Ca2+ store), hereby causing PASMC proliferation, PA vasoconstriction and remodeling, and ultimately PH. Moreover, the increased RISP-dependent ROS can also cause DNA damage to activate Ataxia Telangiectasia Mutated (ATM) kinase, PASMC proliferation, and PA remodeling and PH. Altogether, our results demonstrate that RISP, FKBP12.6, RyR2, and ATM work as a successive signaling pathway to mediate PH and RHF. Furthermore, specific inhibitory blockers and biologics of the molecules as described here may become innovative and effective treatment options for PH, RHF, and other relevant vascular diseases.

4TH EDITION OF

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ORAL PRESENTATIONS

Dr. A. Jamuna Rani M.Sc., Ph.D

Professor, Department of Biochemistry, Sree Balaji Medical College and Hospital, Chennai, Tamil Nadu, India

Impact of meditation on heart: A study among perimenopausal women

Background/Introduction: Perimenopause is a transitional phase in women characterized by hormonal fluctuations, emotional instability, anxiety, and increased psychological stress. Persistent stress activates the Hypothalamic-Pituitary-Adrenal (HPA) axis, resulting in elevated cortisol secretion, autonomic imbalance, oxidative stress, and an increased risk of cardiovascular morbidity. Meditation has emerged as a simple, cost-effective, and non-pharmacological intervention capable of improving psychological well-being and supporting cardiovascular health through modulation of neuroendocrine and biochemical pathways.

Objective: To evaluate the impact of regular meditation practice on stress levels and its potential implications for cardiac health among perimenopausal women.

Methods: A prospective interventional study was conducted among 30 perimenopausal women aged 40–50 years who reported symptoms such as anxiety, emotional stress, and excessive worries. Baseline stress levels were assessed using a standardized stress analysis questionnaire based on perceived stress parameters. Participants underwent a structured meditation program daily from 5:00 a.m. to 6:00 a.m. for one month. Stress analysis scores were recorded before initiation of meditation and reassessed after one month. The pre- and post-intervention scores were compared to determine the effectiveness of meditation in reducing stress levels. The findings were interpreted in relation to established biochemical mechanisms involving cortisol regulation, autonomic balance, and oxidative stress reduction.

Results: Following one month of regular meditation practice, participants demonstrated

a significant reduction in stress analysis scores compared with baseline values. Most participants reported improved emotional stability, reduced anxiety, enhanced relaxation, and better coping ability. The observed reduction in stress levels suggests favorable modulation of stress-related neuroendocrine pathways, which may contribute to improved cardiovascular health among perimenopausal women.

Conclusion: Regular meditation practice significantly reduced perceived stress among perimenopausal women. Given the established association between stress, neuroendocrine dysfunction, and cardiovascular risk, meditation may serve as an effective complementary strategy for promoting cardiac health and overall well-being during the menopausal transition. Further studies involving larger populations and biochemical markers such as cortisol and oxidative stress parameters are recommended to validate these findings.

Keywords: Meditation, Perimenopause, Stress Analysis, Cardiovascular Health, Women's Health, Biochemistry.

Biography

Dr. A. Jamuna Rani M.Sc., Ph.D., is a Professor in the Department of Biochemistry at Sree Balaji Medical College and Hospital, Chennai, India, with over 21 years of teaching and research experience. Jamuna is actively involved in guiding research scholars and serves as an external examiner for several academic institutions. A distinguished medical educator and speaker, Jamuna has presented research at national and international conferences, including AMEE, France, and AIIMS, New Delhi. Jamuna's research interests include diabetes, oxidative stress, medical education, yoga, meditation, preventive medicine, and women's health, with numerous publications in peer-reviewed journals.

Abdullah Muhammad-Nasser[1]*, CJ Ashok Kumar[2] MD, Gopinath Perumal[2] MD

[1]University of Toledo, USA

[2]University of Mississippi Medical Center, USA

Anomalous left main coronary artery from the right coronary cusp with intraconal course and ostial stenosis in an elderly patient: A case report

Background: Anomalous Aortic Origin of a Coronary Artery (AAOCA) is a rare congenital anomaly associated with myocardial ischemia and sudden cardiac death. The risk is particularly significant when the Left Main Coronary Artery (LMCA) arises from the right coronary sinus and follows an inter-arterial or intramural course. While AAOCA is frequently reported in younger patients and athletes, cases presenting in elderly individuals are uncommon. Surgical correction, most commonly via coronary unroofing, has demonstrated favorable outcomes in appropriately selected patients.

Case Presentation: We report the case of a 74-year-old male with hypertension, type 2 diabetes mellitus, and new-onset atrial fibrillation who presented with fatigue and was transferred for cardiac surgical evaluation following a non-ST elevation myocardial infarction. Diagnostic workup revealed atrial fibrillation with rapid ventricular response on electrocardiogram and mildly reduced left ventricular function on transthoracic echocardiography. Left heart catheterization demonstrated an anomalous LMCA arising from the right coronary cusp with approximately 90% ostial stenosis. Cardiac computed tomography angiography confirmed the anomalous origin with an inter-arterial course and an intraconal segment extending into the Right Ventricular Outflow Tract (RVOT) region before emerging onto the epicardium.

The patient underwent surgical repair via median sternotomy and cardiopulmonary bypass. After aortic transection and inspection of the coronary ostium, the narrowed LMCA origin was opened and augmented with autologous pericardial patch osteoplasty. Due to the artery's intraconal course within the RVOT, a transconal approach with supra-coronary

myotomy was performed to free the vessel from surrounding muscle. The resulting RVOT defect was reconstructed using bovine pericardium. To eliminate potential compression from the pulmonary artery, the main pulmonary artery was transected and translocated, with reconstruction performed using patch augmentation.

Outcome: The patient was successfully weaned from cardiopulmonary bypass in sinus rhythm with minimal inotropic support. Postoperative recovery was uneventful. He was extubated the same day, mobilized with physical therapy, and discharged home on dual antiplatelet therapy, beta-blocker, statin, and amiodarone. Follow-up imaging demonstrated no evidence of dissection or ischemic complications.

Conclusion: Anomalous LMCA arising from the right coronary cusp with an intraconal course is an uncommon and potentially high-risk anatomical variant. This case highlights that complex surgical management—including transconal unroofing, coronary osteoplasty, RVOT reconstruction, and pulmonary artery translocation—can be performed safely even in elderly patients with favorable outcomes.

Biography

Abdullah Muhammad-Nasser is a third-year undergraduate student at the University of Toledo majoring in Biology on the pre-medical track. He collaborates with physicians at the University of Mississippi Medical Center and the University of New Mexico, contributing to clinical research and documenting rare cases involving congenital coronary anomalies and cardiothoracic surgical management.

Abhinav Grover MD, MS

University of Pennsylvania, Philadelphia, PA, USA

Heart transplant rejection: From endomyocardial biopsy to molecular testing and pediatric considerations

Background: Heart transplantation remains the definitive therapy for end-stage heart failure, but allograft rejection continues to be a major cause of morbidity and graft dysfunction. Traditional surveillance has relied on Endomyocardial Biopsy (EMB), which provides direct histologic assessment but is invasive, carries procedural risks, and is subject to interobserver variability.

Objectives: Emerging noninvasive surveillance tools, including Donor-Specific Antibodies (DSAs), donor-derived cell-free DNA (dd-cfDNA), and Gene Expression Profiling (GEP), were systematically reviewed, with particular emphasis on pediatric patients.

Results: Studies of donor-derived cell-free DNA (dd-cfDNA), including D-OAR/DEDUCE, GRAFT, and SHORE, consistently show high negative predictive value for excluding rejection. In the AlloMap Registry, a threshold of 0.25 for moderate-to-severe acute cellular rejection yielded 83% accuracy, 58% sensitivity, and 93% specificity; combined Gene Expression Profiling (GEP) and dd-cfDNA testing achieved a 97% negative predictive value. GRAFT and DEDUCE, including Prospera-based testing, reported similarly strong rule-out performance. GEP studies (CARGO, CARGO 2, IMAGE, and eIMAGE) also demonstrated high negative predictive value, and randomized trials showed outcomes comparable to biopsy-based surveillance. AlloMap remains the only FDA-approved assay and is listed as a class IIa recommendation in the 2010 ISHLT guidelines. Recent guideline updates in 2023 increasingly support molecular biomarkers, particularly in pediatric practice: they are considered reasonable in infants and younger children and are now recommended as primary noninvasive screening tools in older children and adolescents. Interpretation of molecular assays requires caution in settings

such as infection, systemic inflammation, ischemia, trauma, recent transfusion, other organ or stem-cell transplantation, and HIV. In addition, three studies of Artificial Intelligence (AI) in histopathology reported diagnostic accuracies of 71%–98% for acute cellular rejection, antibody-mediated rejection, and cardiac allograft vasculopathy.

Conclusion: The field is moving toward a hybrid surveillance model that combines histology, molecular profiling, and risk stratification to detect rejection more accurately and less invasively. Pediatric studies further suggest that integrating molecular methods with risk prediction models may meaningfully reduce biopsy frequency without compromising rejection detection. Future progress will likely depend on stronger validation of these tools, integration with AI-assisted interpretation, and tailored application across adult and pediatric transplant populations.

Biography

Dr. Abhinav Grover is an attending physician who studied medicine and completed residency at the University of Delhi, India and graduated with MBBS and MD in 2016. Abhinav then completed a graduate program in translational medicine at the University of California, Irvine. Abhinav received her MS degree in 2018 at the same institution. After one year of research fellowship at the Allegheny Health Network, USA, he obtained a clinical position at the Medical College of Wisconsin and subsequently at the hospital affiliated with the University of Pennsylvania. Abhinav has published more than 30 research articles and peer-reviewed abstracts in reputable journals.

Abhishek Bansal

New Era Consultancy Services, India

Clinically interpretable cardiac disease modeling using the bansal B–Bio framework: From coronary ischemia to arrhythmias, pump dysfunction, cardiomyopathies, and heart disorders

Contemporary cardiac disease modeling and electrocardiographic interpretation remain largely dominated by waveform-centric heuristics, statistical signal processing, and black-box artificial intelligence. Although such methods may provide empirical classification, they often fail to explain why a cardiac state is normal, unstable, progressive, reversible, or dangerous. This limitation is especially serious in cardiology, where coronary ischemia, arrhythmias, conduction disorders, pump dysfunction, cardiomyopathies, valvular disease, remodeling, and cardio-oncology injury evolve through coupled electrical, mechanical, vascular, biochemical, and tissue-level processes. This presentation introduces a clinically interpretable cardiac disease modeling paradigm based on the Bansal B-Bio Framework, supported by the Eleven Pillars of the B-Bio Core Biology Framework namely algebra, manifold, projection, trajectory, curvature, operators, holonomy, entropy, fiber bundle, tensor, and connection, as a unified foundation for cardiac physiology, pathology, observability, and clinical interpretation.

The central significance of the Bansal approach is that cardiac disease is not reduced to a waveform label. Instead, the heart is represented as a stratified algebraic–geometric biological system whose fibers encode oscillatory electrical activity, depolarization-repolarization dynamics, conduction pathways, perfusion geometry, myocardial deformation, cellular injury, tissue remodeling, and pump function. Within this structure, coronary ischemia becomes a perfusion-oxygen-geometry disturbance; arrhythmia becomes an admissibility failure in oscillatory conduction; heart failure becomes progressive pump-state deformation; cardiomyopathy becomes persistent myocardial structural reorganization; and sudden

cardiac death risk becomes a geometry-constrained instability rather than a black-box probability score.

The Eleven Pillars give the Framework its Broader Clinical Strength: Biological state-space modeling, measurable projection operators, disease-state boundaries, uncertainty and calibration, patient-specific inference, experimental consistency, multi-organ coupling, physiological control, observability, drug response, and clinically interpretable state transitions. These pillars allow cardiac disease to be interpreted across ECG, imaging, biosignals, blood markers, perfusion, electrophysiology, and therapy response without collapsing the system into a single linear signal or opaque machine-learning output.

Finite element modeling further strengthens the cardiac interpretation by connecting Bansal physiological geometry with anatomy, mesh generation, material properties, boundary conditions, structural deformation, blood-flow interaction, electrophysiology, ablation, implants, and surgical planning. In cardiology demonstrations, vessels, atria, ventricles, valves, arterial pathways, venous pathways, and blood-flow routes can be represented as geometry-admissible cardiac structures rather than isolated diagrams.

Pharmacology is also incorporated through bansal B-Pharma interpretation of ion-channel modulation, drug-induced arrhythmia, chemotherapy-related cardiotoxicity, enzyme inhibition, drug transport, PK/PD response, and multi-organ safety monitoring. Thus, disease progression, drug effect, tissue deformation, and cardiac signal evolution can be interpreted together.

The contribution is a bansal-centered shift from waveform classification to clinically meaningful biological geometry: A deterministic, explainable, auditable, and physiologically grounded framework for next-generation cardiac disease modeling, digital-twin reasoning, finite-element planning, and software-based demonstration via SaMD.

Biography

Abhishek Bansal is an independent consultant, researcher, and amateur scholar. His latest works represent the culmination of more than 20 years of independent self-funded and self-directed research characterized by original discovery, rigorous simulation, open dissemination and introduce novel research claims, discoveries, models, equations, theories, propositions, and algorithms, broadly grouped into (a) Engineering: Novel B-Equations and frameworks, with applications in impedance analysis, transformers, inverters, generators, pumps, solar systems, machinery, turbines, batteries, SMPS, and short-circuit analysis. (b) Medical: Unified approaches bridging engineering with clinical and pharmaceutical sciences through novel B-Bio Models, Equations and BvidAL Algorithms for diagnosis and therapeutic support.

Associated Professor Agustín Joison Ph.D

Córdoba Catholic University, Córdoba, Argentina

Arterial and venous thrombolysis with a new modified JG microplasmin

Introduction: The fibrinolytic activity in human plasma was subsequently shown to depend on activation of a plasminogen as precursor. As plasmin derives from plasminogen, it is possible that microplasmin also has a precursor, microplasminogen. The present study describes the activity in carotid artery and venous thrombus of a functional novel microplasmin, derived by autocleavage of nonenzymatic plasminogen, with a height affinity to fibrin Lys site.

Material and Methods: Thirteen male and female rabbits, seven (group A) treated with microplasmin and six (group B) as placebo, weighing 2500–3200 g were initially anaesthetized with ketamine. The carotid artery was occluded by using a protothrombotic solution (calcium, tissue factor) (protocols of experimental surgery laboratory, Cordoba Catholic University). For the venous study, two vessels were used, one treated with saline solution and the other with JG microplasmin.

Results: The thrombolytic activity showed reperfusion in all of the animals (100%) treated with microplasmin and none in the group treated with placebo (0%) (P¼0.002). The analysis of Echo Doppler in the carotid artery showed normal flow prethrombosis, thrombosis after 30 min, partial thrombolysis after 15 min of microplasmin activity into the artery and total thrombolytic effect after the another 15 min of injection. Regarding venous vessels, total thrombolysis was observed in the treatment with microplasmin JG.

Conclusion: The use of new forms of microplasmins could improve the resolution of arterial and venous thrombosis of small caliber vessels.

Biography

Agustin Joison is a biochemist who graduated from the National University of Córdoba in 1980. In 2003, he received his master's degree in health services management and earned his doctorate in health sciences in 2017. Since 1994, Agustin Joison has served as a professor and researcher at the Catholic University of Córdoba. He has published 25 articles and participated in several conferences. In 2007, he obtained a patent for the development of a fibrinolytic protein.

Andrey Belousov[1,2*], Belousova EYu[1]
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[2]Kharkiv National Medical University, Ukraine

Modulation of erythrocyte mobility using magnetite nanoparticles: A nanomedical perspective for critical care and transfusion therapy

A decrease in erythrocyte electrophoretic mobility serves as an important diagnostic marker of pathological conditions associated with impaired gas exchange, microcirculation, and tissue trophism, often leading to systemic hypoxia and deterioration of the patient's clinical status. This study investigates the potential of magnetite nanoparticles (MCS-B) to modulate these properties in a targeted and controlled manner. A novel approach is proposed to enhance erythrocyte electrophoretic mobility in patients with toxemia through treatment with magnetite nanoparticles. In vitro experiments demonstrated a statistically significant ($p<0.001$) increase-nearly threefold-in erythrocyte mobility following exposure to MCS-B, compared to untreated controls. The optimal efficacy was observed at a blood-to-nanoparticle ratio of 2:1. Furthermore, application of a constant magnetic field with an intensity of 200–250 kA/m for 2-3 minutes resulted in effective removal of residual nanoparticles from blood samples ($p<0.001$). The results highlight the biocompatibility and clinical potential of this nanomedical approach, which may serve as a basis for new therapeutic strategies in transfusion medicine, critical care, and regenerative therapy. The study addresses a pressing interdisciplinary challenge, bridging hematology, biophysics, and nanotechnology, with implications for both basic science and clinical implementation.

Biography

Andrey N. Belousov MD, PhD, Professor is a Ukrainian medical scientist and pioneer in nanotechnology, who developed the world's first biocompatible nanomedical drugs (Micromage-B, MCS-B, ICNB), officially registered and introduced into clinical practice since 1998. His work established a translational foundation for medical nanotechnology, linking fundamental biophysics with clinical applications in detoxification, hemocorrection, and neuroprotection. The published more 340 scientific works on results application of nanotechnology preparation in experimental and practical medicine. At present, Andrey Belousov is the Head of Laboratory Applied Nanotechnologies, Professor of Kharkiv National Medical University, Ukraine.

Cristina Milagre Quadros Borges

Heart Hospital-Hcor, Brazil

Coronary disease in women

Cardiovascular Diseases (CVD) correspond to the main cause of death worldwide in both genders. There was an increase in the prevalence of CVD in the last 30 years in young people aged 15-49 years, of both genders with proportional mortality was higher in women throughout the period from 1990 to 2019. In women, cardiovascular mortality occurs mainly due to ischemic heart disease (DIC) and cerebral vascular disease. Currently, mortality from cardiovascular disease in women is higher worldwide, surpassing cancer. In addiction to traditional risk factors such as diabetes mellitus, high blood pressure, dyslipidemia, inadequate diet, smoking, obesity and physical inactivity, we have risk factors specific to women. They are: Autoimmune diseases such as reumatoid arthritis, systemic lupus erythematosus, psoriasis (higher prevalence in the female poplulation), polycystic ovary syndrome, breast cancer treatment, cardiometabolic gestatinal disorders, hormone replacement therapy, depression and anxiety (also more prevalent among women). After menopause, the prevalence and mortality from CVD increases. Menopause brings a decline in circulating estrogen levels, which increasing cardiovascular risk due to its effects on adiposity, lipid metabolism and prothrombotic state. Regarding symptoms, women have more frequently atypical symptoms such as isolated epigastric pain, nausea, sensation of gastric fullness, palpitations and isolated dyspneia than make difficult or delay the diagnosis of Coronary Disease (CAD). There are several coronary conditions that cause ischemia, such as myocardil infarction in the absence of coronary artery obstruction (MINOCA), ischemia in the absence of coronary obstruction (INOCA), spontaneous coronary artery dissection, microvascular disease, coronary vasospasm and coronary embolism/thrombosis. The physiopatology of atherosclerosis shows diferent patterns between women and men due to inherent biological and social diferences. It is estimated that about 3 to 4 million adults in The USA have the disorder called INOCA- more common in women. CAD in women commonly has less pronounced atherosclerotic burden, including all plaque subtypes. Risk scores are tools that they may underestimate

or overstimate risk in certain groups and may overlook risk factors not captured in source popularions. Additional or female-specific risk factors have not been incorporated into any cardiovascular risk assessment tool. This phenomenon knwon as the “gender paradox” can lead to incorrect diagnosis and worse outcome of coronary disease in women. Some studies show that women tend to receive fewer of these therapies compared to men. Therefore, it’s essential to have a specific look at women when it comes to coronary disease once it is high morbidity and mortality for them around the world.

Biography

Cristina Milagre Quadros Borges is a cardiologist at Hospital of Heart in Sao Paulo, Clinic Check-up and outpatient care. She Graduated from the College of Medical of Petropolis, Rio de Janeiro in 2001, Specialized in Clinical Cardiology at the Real and Benemerita Society Portuguese the Beneficencia in Sao Paulo from 2002 to 2004, followed by a Specialization in electrocardiography from University of Sao Paulo, University of Medical (2004 to 2006). Cristina is Expert in Cardiology by Brazilian Society by Cardiology in 2006 and Ergometry in 2007, and a specialist in Medical Sport by the Brazilian Society of Exercise and Medical Sport in 2023. She is the Member of the cardiovascular disease study group in women at hcor.

Debprasad Dutta

Mazumdar Shaw Medical Foundation, India

Vascular risk: Prediction is the mother of prevention

In vascular medicine, the greatest challenge is not the complexity of the disease, but the silence with which it evolves. We must now harness predictive intelligence to break that silence.

This presentation posits that the potential of vascular medicine lies in the seamless integration of comprehensive clinical phenotyping with advanced molecular diagnostics. By synthesizing metabolic, environmental, and behavioral data—such as dietary patterns, stress, sleep architecture, and systemic biomarkers—we can establish a more precise, population-specific risk profile. Moving beyond traditional scores, we must embrace a holistic understanding of the cardiovascular system that accounts for the complex interplay between systemic health and individual susceptibility.

Precision in prevention requires an integrated understanding of the human body's molecular language. Recent insights into the molecular language of stroke reveal that systemic blood-based biomarkers can effectively serve as surrogates for central pathology. Through the identification of conserved transcriptomic signatures related to oxidative stress, neuroinflammation, and vascular remodeling, we are uncovering the potential to monitor vascular health in real-time through minimally invasive means. This molecular lens provides a framework for detecting subclinical disease progression long before symptoms arise, offering a window for timely, personalized intervention.

The mandate for the next generation of vascular medicine is clear: We must replace the paradigmatic inertia of "wait and see" with the precision of "detect and defend". By anchoring our strategies in biological rigor and predictive foresight, we can intervene in the cascade of disease while the system retains its plasticity. Ultimately, in the realm of vascular health, the most significant intervention is not the one that saves a life in crisis, but the one that ensures the crisis never occurs.

Biography

Debprasad Dutta is a neurovascular biologist and translational scientist with expertise in risk-omics, transcriptomics, and vesicular medicine. His present research focuses on the molecular mechanisms of cerebrovascular disorders, emphasizing the integration of clinical data with biomarker signatures to improve disease prediction, prevention, and prognosis. Currently, he is enthralled with advancing precision medicine through a translational lens, bridging the gap between bench-side molecular discovery and unmet clinical needs. Through his work in connectomics and molecular neurocardiology, he is dedicated to developing proactive, patient-centric predictive, diagnostic, therapeutic, and prognostic innovations that aim to transform vascular care.

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SGLT2 inhibitors after myocardial infarction: Beyond glycemic control to inflammasome modulation

Heart failure remains a major complication following Myocardial Infarction (MI), driven in part by sterile inflammation and adverse ventricular remodeling. While Sodium-Glucose Cotransporter-2 (SGLT2) inhibitors have demonstrated robust cardiovascular benefits independent of glycemic control, the underlying mechanisms remain incompletely defined. Emerging evidence suggests a role for inflammasome modulation, particularly the TXNIP/NLRP3 axis, in mediating these effects.

Objective: To investigate whether SGLT2 inhibition attenuates myocardial injury after MI through suppression of the TXNIP/NLRP3 inflammasome pathway.

Methods: A rat model of Left Anterior Descending (LAD) coronary artery ligation was used to induce MI. Animals were randomized to receive vehicle or dapagliflozin (5 or 10mg/kg) administered 1hour post-MI. Outcomes were assessed at 72 hours, corresponding to peak inflammatory activation. Infarct size was quantified by Triphenyltetrazolium Chloride (TTC) staining. Protein expression of TXNIP, NLRP3, and IL-1β was evaluated by Western blot. Cardiac injury markers (troponin, BNP) and hemodynamic parameters were also measured. Mechanistic validation was performed using CRISPR-mediated overexpression of TXNIP or NLRP3.

Results: Dapagliflozin significantly reduced infarct size by approximately 20% compared to MI controls. This was accompanied by marked suppression of TXNIP and NLRP3 expression, as well as decreased IL-1β levels, indicating functional attenuation of inflammasome signaling. Cardiac injury markers, including troponin and BNP, were significantly reduced. Importantly,

CRISPR-mediated activation of TXNIP or NLRP3 reversed the cardioprotective effects of dapagliflozin, restoring infarct size and inflammatory signaling toward untreated MI levels. No significant differences in blood pressure or heart rate were observed, and all experiments were conducted in non-diabetic animals, supporting a glucose-independent mechanism.

Conclusion: SGLT2 inhibition confers cardioprotection following MI through suppression of the TXNIP/NLRP3 inflammasome pathway. This effect is mechanistically required, independent of glycemic control and hemodynamic changes. These findings suggest that SGLT2 inhibitors may function as early modulators of sterile inflammation, highlighting their potential role in limiting post-MI injury and preventing progression to heart failure.

Clinical Implications: Targeting inflammasome activation early after MI may represent a novel therapeutic strategy. These data support further investigation into the timing and mechanistic application of SGLT2 inhibitors in acute coronary syndromes.

Biography

Desislava Doycheva PhD is an Assistant Professor in the Department of Cardiology at Loma Linda University and has over a decade of experience in translational neuroscience and cardiovascular research, with extensive expertise in small-animal disease models, molecular biology, and mechanistic studies of ischemic injury. Her earlier work focused on neonatal hypoxic–ischemic encephalopathy and ischemic stroke, where she contributed to multiple NIH-and AHA-funded studies investigating endoplasmic reticulum stress, inflammation, and neuroprotection. In recent years, Dr. Doycheva has expanded her research program into cardiovascular disease, leading studies in rat myocardial ischemia–reperfusion models to investigate the anti-inflammatory and cardioprotective mechanisms of sodium–glucose cotransporter-2 (SGLT2) inhibitors. Her current work examines both acute and chronic SGLT2 inhibitor treatment in diabetic and non-diabetic myocardium, with a particular focus on TXNIP/NLRP3 inflammasome signaling, oxidative stress, and post–myocardial infarction remodeling. Dr. Doycheva has authored over 50 peer-reviewed publications and is actively involved in NIH and American Heart Association grant development, mentoring, and collaborative translational research.

Faizan Butt* MD; Priyank Chokshi MD; Stephen Aben MD; Akshay Kumar MD; Marc Katz MD, FACC

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Cocaine induced Accelerated Idioventricular Rhythm (AIVR)

Introduction: Cocaine-induced cardiotoxicity is a well-recognized phenomenon associated with a broad spectrum of cardiovascular complications, including arrhythmias. We present a case of a 26-year-old male with a history of Mitral Valve Prolapse (MVP) who developed Accelerated Idioventricular Rhythm (AIVR) in the setting of recent cocaine use, stimulant exposure, and binge alcohol consumption.

Case Presentation: The patient presented with palpitations, lightheadedness, and chest discomfort. Initial evaluation revealed sinus tachycardia and a wide-complex rhythm consistent with AIVR on electrocardiogram. Laboratory workup, including electrolytes and cardiac biomarkers, was unremarkable, and imaging with transthoracic echocardiography demonstrated preserved left ventricular function with mild mitral regurgitation related to MVP. Toxicology screening was positive for cocaine. The patient was admitted for cardiac monitoring, during which intermittent episodes of AIVR were observed, occasionally associated with bradycardia. Despite these findings, he remained hemodynamically stable throughout hospitalization.

Management was primarily supportive. Beta-blockers were avoided due to the risk of unopposed alpha-adrenergic stimulation in the context of cocaine use. The arrhythmia resolved spontaneously, and the patient was discharged with plans for outpatient Holter monitoring and cardiac MRI. Follow-up imaging revealed no structural abnormalities, myocardial inflammation, or fibrosis.

Discussion: Cocaine exerts its cardiotoxic effects through multiple mechanisms, including inhibition of catecholamine reuptake, sodium channel blockade, and coronary vasoconstriction. These effects increase myocardial oxygen demand, disrupt electrical conduction, and predispose patients to a range of arrhythmias. While AIVR is typically considered a benign and transient rhythm, its occurrence in the setting of cocaine use highlights underlying myocardial irritability and necessitates careful evaluation.

This case underscores the importance of distinguishing cocaine-induced AIVR from more malignant ventricular arrhythmias such as ventricular tachycardia, as management strategies differ significantly. Recognition of this presentation can help avoid unnecessary interventions and guide appropriate supportive care. Early identification and counseling on substance use are critical to preventing recurrent cardiac events.

Biography

Faizan Butt MD is a PGY-2 Internal Medicine Resident at Rutgers Jersey City Medical Center with focused interest in cardiovascular medicine. His clinical and academic interests include advanced heart failure, mechanical circulatory support, cardiogenic shock and complex coronary interventions. He is actively engaged in quality improvement and outcomes-based research initiatives aimed at optimizing guideline-directed medical therapy and improving cardiovascular risk stratification. Faizan led and collaborated on IRB-approved projects and multidisciplinary efforts designed to enhance inpatient and transitional cardiac care. With a strong foundation in hemodynamic assessment and devise-based therapies, and is committed to integrating evidence-based medicine with innovative clinical practice. He has plans to pursue fellowship training in cardiovascular disease and aspires to contribute to academic cardiology through research, education and leadership focus on improving patient centered cardiovascular outcomes.

Franz Porzsolt

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"Joint option II": Doctors can apply Care As Usual (CAU) if scientists and nurses use Pragmatic Controlled Trials (PCTs) to analyse outcomes

Background: A team of international cardiologists has suggested replacing the complex experimental "Randomized Controlled Trials (RCTs)" with simpler concepts named "Joint Option". The idea is perfect, but the solution is rather difficult. Experiments overestimate the "Real-World Effectiveness (RWE)" by about 30%. The RWE describes outcomes that are influenced by two factors: The individual "Endpoint-Specific Risk Profiles (ESRPs)" of each patient and the "Individual Care Strategies (ICS)" of all physicians treating the greater impact on the final outcomes than our therapies. Therefore, comparing therapies only makes same patient. The ESRPs have a significantly sense within cohorts of patients with a common disease e.g. hypertension, similar ESRPs, and a sufficiently large population (i.e. Eco-Systems of about 100 million inhabitants) to capture the variance.

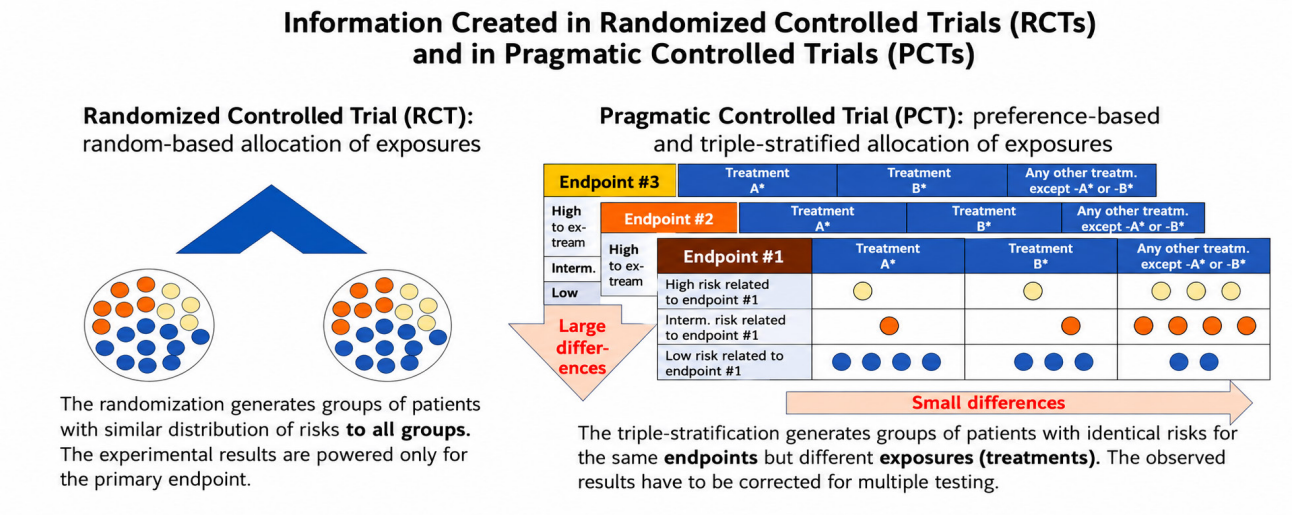
Objective: Presentation of a valid solution considering both influencing factors, the ESRPs and the ICS. This is achieved in a Pragmatic Controlled Trial (PCT), proposed as the first draft of a "Joint Option II".

Results: The numerous and precise steps for developing a PCT are described and justified. Figure 1 illustrated the differences between experimental RCTs and Pragmatic Controlled Trials (PCTs).

Discussion: There is currently no known simple solution. However, the proposal appears to be feasible through three strategic measures. 1) The tasks of care and research are assigned to cooperative teams of doctors and nursing staff based on their interest in CAU or science and

abilities. 2) Interests and abilities of nurses and doctors are different but equally important. 3) Different phases of professional career qualify employees for different tasks. The allocation of tasks based on interests and qualifications could measurably increase the efficiency of health care.

Figure 1: Formal and functional differences between RCTs and PCTs. Modified from: Porzsolt F, Weiss Ch, Weiss M, Müller AG, Becker SI, Eisemann M, Kaplan RM. Versorgungsforschung braucht dreidimensionale Standards zur Beschreibung von Gesundheitsleistungen [Health services research needs three-dimensional standards for description]. Monitor Versorgungsforschung 2019;04:53-60.



Biography

Franz Porzsolt completed his medical education in 1967 at the University of Marburg in Germany. In 1974, he became a grantee of the German Research Association and worked at the Ontario Cancer Institute in Toronto. By 1976, Franz Porzsolt was a resident in General Medicine and Hematology/Medical Oncology, and he also earned his PhD from the University of Ulm. In 1985, he advanced to the position of Senior Resident and supervisor in Hematology/Medical Oncology. In 1993, he took on the role of Managing Supervisor in Internal Medicine and served as Scientific Secretary of a Cancer Center. Two years later, in 1995, Franz Porzsolt became involved with the working group “Clinical Economics” and joined the Cochrane Collaboration. In 2005, he served as a Visiting Professor at the Mayo Clinic in Rochester, Minnesota, USA. In 2009, he worked as a reviewer for the International Atomic Energy Agency (IAEA) in Vienna and also held visiting professorships at several Brazilian universities, including UFF, USP, UNIFESP, UNILA, UNIOESTE, and Escola Bahiana de Medicine. He retired in 2011, and in 2013, he established a Private Research Institute focused on Clinical Economics.

Geeta Deswal

Guru Gobind Singh College of Pharmacy, Yamuna Nagar, Haryana, India

Herbal and natural product-based interventions in Cardiovascular Disease (CVDs) management

Cardiovascular Diseases (CVDs) remain a leading cause of global morbidity and mortality, necessitating the exploration of complementary and integrative therapeutic strategies alongside conventional pharmacotherapy. Herbal medicines and natural products have long been utilized for cardiovascular health due to their multi-targeted actions, antioxidant potential, and favorable safety profiles. This presentation highlights the role of medicinal plants and bioactive phytoconstituents in the prevention and management of cardiovascular disorders, with particular emphasis on cardiometabolic and lifestyle-related diseases. The discussion will focus on issues related to quality assurance, standardization, and safety evaluation of herbal cardiovascular formulations, addressing challenges such as variability in phytochemical composition, contamination, and regulatory concerns. Furthermore, translational perspectives bridging traditional knowledge with modern scientific validation will be explored, including phytochemical screening, analytical quality control, and evidence-based integration into contemporary cardiovascular care. The session aims to provide insights into the rational and safe incorporation of herbal interventions in cardiovascular disease management, supporting their potential role in personalized and preventive cardiology.

Keywords: Herbal Medicines, Cardiovascular Diseases, Phytochemicals, Quality Control, Translational Research, Cardiometabolic Disorders.

Biography

Dr. Geeta Deswal is a dynamic academic professional with over 12 years of extensive experience in pharmaceutical education and research. Currently serving as a Professor and Head of the Department of Pharmacognosy at Guru Gobind Singh College of Pharmacy,

Yamuna Nagar, she also coordinates the Internal Quality Assurance Cell (IQAC) and the National Board of Accreditation (NBA). Dr. Deswal holds a Ph.D. in Pharmaceutical Sciences from MM University, Mullana, with a research focus on the quality audit of marketed herbal formulations and phytochemical screening of medicinal plants. Her impressive publication record includes 40 research papers, 10 books, and 15 book chapters, along with 6 patents (2 granted), demonstrating her commitment to advancing pharmaceutical sciences. She has successfully secured several grants from DBT and MSME and has received multiple awards, including the "Best Counsellor Award" from the Youth Red Cross Society and the "Young Achiever Award" at Pharma Vision 2K25. Dr. Deswal is a life member of the Association of Pharmaceutical Teachers in India and a registered pharmacist with the Haryana State Pharmacy Council. Her dedication to continuous learning is evident through her organization of over 30 Faculty Development Programs (FDPs), conferences, seminars, and workshops.

Zhuo Chen, Guo-Wei He*

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LKB1-AMPK signaling pathway in cardiovascular diseases

The LKB1–AMPK signaling pathway is a core regulatory axis of cellular energy homeostasis and a pivotal hub in stress adaptation. As an evolutionarily conserved metabolic sensor, this pathway coordinately regulates glucose, lipid, and protein metabolism, thereby maintaining physiological functions across diverse tissues. Beyond its canonical role in energy balance, accumulating evidence indicates that dysregulation of this pathway is closely associated with a broad spectrum of pathological conditions. Importantly, pathway outputs are highly context dependent, shaped by subcellular localization, upstream kinase inputs, and the intensity and duration of stress. Although substantial mechanistic work has been performed, the disease-specific regulatory principles of the LKB1–AMPK pathway and its translational potential remain incompletely defined.

We systematically summarize the molecular basis and regulatory mechanisms of the LKB1–AMPK pathway in cardiovascular diseases, including atrial fibrillation, ventricular fibrillation, myocardial infarction, cardiac hypertrophy, heart failure, and atherosclerosis. Across these conditions, impaired LKB1–AMPK activity emerges as a fundamental driver of insufficient energy metabolism, fibrosis, oxidative stress, and arrhythmogenesis.

Emerging therapeutic strategies, exemplified by metformin, next-generation AMPK activators, and LKB1-based gene therapies, show promise. However, they also face major challenges, such as limited tissue specificity, off-target effects, and genetic heterogeneity. By integrating advances from the cardiovascular field, we highlight the dual potential of the LKB1–AMPK pathway as both a source of biomarkers and a therapeutic target, providing a theoretical framework to support precision medicine for complex diseases. Moving forward,

precise patient stratification and optimized dosing windows, guided by mechanism-linked biomarkers, will be essential to translate these approaches into clinical benefit.

Biography

Guo-Wei He MD, PhD, DSc, is a Distinguished Professor at Tianjin University and serves as an Academician (Foreign Correspondence Member) of the National Academy of Medicine, France. He is the Director of the Institute of Cardiovascular Diseases at Tianjin University and the Vice President and Senior Cardiac Surgeon at TEDA International Cardiovascular Hospital. In addition, Guo-Wei He holds the position of Clinical Professor of Surgery at Oregon Health & Science University, Portland, USA.

Hector Velasco-Perez*, Dylan Vermoortele, Piet Claus
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A fitting pipeline to reproduce the dynamic of high complexity electrophysiology models

In the last 30 years, people have devoted great efforts to generate models that reproduce the electrophysiological complexity of patient hearts. These models are referred to as digital twins and require a large number of parameters to be calibrated through experimental data and careful analysis. The choice of observables to perform the fit is crucial in determining if the model will provide useful information. In the literature, it is common to find articles in which the cardiac Action Potential (AP) morphology or a single restitution curve serves as the only data source for the fit. This problem leads to a situation in which the model reproduces a limited set of features and is susceptible to overfitting, which means that there is no way to ensure that the model behaves appropriately in a physiological and dynamical way. In this work, we present a new fitting pipeline that incorporates AP duration, conduction velocity, and activation time restitution features in single-cell and tissue. These observables are commonly measured in experimental and clinical setups and provide information at a tissue level; thus avoiding the need for slow and convoluted experiments or sampling them from other systems. Furthermore, the model we fit is a phenomenological model with a low number of parameters; hence, we are able to create a one-to-one map between the observables and most of the parameters. Our results show that the pipeline is able to reproduce the restitution and dynamical complexity of realistic human models in single-cell and tissue while increasing the computational speed of the simulations and avoiding redundant parameter fits. Moreover, we show that our method can be applied to ventricle and atria systems, corroborating the universality of our new fitting paradigm. Finally, we discuss the clinical applicability of the pipeline and suggest optimizations to it.

Biography

Hector Velasco-Perez is a postdoc researcher. He did his bachelor in plasma physics. Next, he joined a PhD program in cardiac electrophysiology mathematical modelling at Georgia Tech, USA. Hector Velasco-Perez did his thesis in developing data-driven model reduction methods. After finishing his PhD, he joined a company called Maxwell Biomedical where he worked on the activation detection algorithms of a low-energy cardiac defibrillator. After working there for two years he found a postdoc position in KU Leuven, Belgium, where he has been working for one year. Hector Velasco-Perez is currently interested in cardiac electrophysiology digital twin models.

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Gender differences in cardiac structure between older men and women

Background: Gender differences in cardiac structure may reflect body size and comorbidity patterns and have implications for diagnosis and risk stratification in older adults. The aim is to compare Left Ventricular Wall Thickness (LVWT) and Left Atrial (LA) size between older men and women.

Methods: Cross-sectional analysis of echocardiographic and clinical data from 978 adults aged ≥65 (men 509, women 469). Echocardiographic measures (using Philips Affiniti 70 scanner) included LVWT (mm), LVWT indexed to body surface area (mm/m2), LA volume (mL) and LA volume index (LAVI, mL/m2). Clinical covariates included age, Body Surface Area (BSA), hypertension, BMI and Left Ventricular Ejection Fraction (LVEF). Between-gender comparisons used t-tests/chi-square tests; multivariable linear regression estimated the adjusted effect of male gender on each outcome.

Results: Mean age was 72.6±5.7 years. Men had larger BSA than women (1.95±0.15 vs 1.71±0.13 m2, p<0.001). Unadjusted comparisons showed greater absolute LVWT in men (11.8±2.6 vs 10.6±2.5 mm; mean difference 1.2mm, 95% CI 0.9–1.5, p<0.001) and larger LA volume (48.0±14.2 vs 42.5±13.6 mL; mean difference 5.5mL, 95% CI 3.8–7.2, p<0.001). After multivariable adjustment (age, BSA, hypertension, BMI, LVEF), male gender remained associated with a modestly greater absolute LVWT (β=+0.48 mm, 95% CI 0.18–0.78, p=0.002) but not with LVWT indexed (β=−0.05 mm/m2, 95% CI−0.28–0.18, p=0.66), LA volume (β=+1.2 mL, 95% CI−0.9–3.3, p=0.27), or LAVI (β=−0.42 mL/m2, 95% CI−1.24–0.40, p=0.31).

Conclusions: In this cohort of older adults, men had larger absolute LV wall thickness and LA volume than women but indexing for body size and adjustment for clinical covariates attenuated these differences.

Biography of A:

Leva Malinauskaitė has been working as an MSK radiology resident at Lucerne Hospital since 2024. Prior to this, she served as a radiologist at Emmental Hospital from 2022 to 2023. Her earlier clinical training includes a radiology residency from 2016 to 2021 and an internal medicine residency from 2015 to 2016. Leva Malinauskaitė completed her medical studies at the Faculty of Medicine, University of Geneva between 2012 and 2015, and previously studied at the Faculty of Medicine, Lithuanian University of Health Sciences from 2008 to 2012. During her training, she also undertook a radiology internship at Oxford University Hospital from 2008 to 2014, with an additional placement from August to September 2014. In terms of qualifications, Leva Malinauskaitė obtained her FMH Diploma in Radiology in 2024, earned her Doctor of Medicine degree from the Faculty of Medicine, University of Geneva in 2018, and received her Diploma in Human Medicine from the same institution in 2015.

Biography of B:

Mindaugas Malinauskas. Professional Experience: From 2024-09-02 – Cardiologist at Klaipėda City Polyclinic. 2020-08 – 2024-07 – Cardiology resident at LSMUL Kaunas Clinics. 2022-10 – 2022-12 – Echocardiography, cardiac magnetic resonance tomography (MRT), electrophysiology practice with the Erasmus+ program at Grenoble Alpes University Hospital, France. 2023-10 – 2023-12 – Cardiac MRT, angiography practice with the Erasmus+ program at Saint Denis University Hospital, France. Education: 2024-06-18 – Passed the Cardiology Exam of European Society of Cardiology. 2020-2024 – Lithuanian University of Health Sciences Cardiology Residency Studies. 2014-2020 – Faculty of Medicine, Lithuanian University of Health Sciences, medical studies. 2020 06 26 – Master's degree (with honors) and qualification as a medical doctor.

Dr. Iris-Panagiota Efthymiou FHEA
Regent College London, United Kingdom

Beyond data: Behavioural economics and AI in cardiovascular care

Cardiovascular disease accounts for approximately 18 million deaths annually, yet up to 80% of premature cardiac events are preventable, and medication adherence in chronic cardiovascular conditions remains at just 50–60%. This gap is not a knowledge deficit; it is a behavioural one. Drawing on behavioural economics, this presentation examines how present bias leads patients to discount future cardiac risk, how optimism bias undermines engagement with preventive protocols, and how clinicians operating under time pressure rely on heuristics that produce systematic distortions, manifesting in the overuse of stents in stable angina and the underuse of statins in high-risk populations. Artificial intelligence is increasingly deployed across cardiovascular care, from predictive modelling for heart failure readmissions to AI-assisted imaging showing detection accuracy improvements of 10–20% in selected studies; however, AI models trained on historical clinical data inherit the inequities and cognitive errors embedded in past decisions, and through self-reinforcing feedback loops, these patterns become automated, scaled, and institutionalised. The real opportunity lies not in deploying AI alone, but in combining it with behavioural insight: Embedding nudges at point-of-care interfaces to counter anchoring and availability bias, deploying personalised adherence interventions using patient-specific timing and framing, and designing real-time risk communication tools that meaningfully reduce optimism bias—approaches shown to shift clinical prescribing behaviour by 5–15%, consistently outperforming complex educational interventions. AI will not fix decision-making in cardiology. It will expose it. The central question is not whether we are building smarter tools, but whether we are building tools that produce better decisions, or merely faster ones, at scale, and with the veneer of objectivity.

Biography

Dr. Iris-Panagiota Efthymiou FHEA is a Senior Lecturer and Behavioural Economist holding academic positions at Regent College London (in partnership with the University of Greater Manchester), FuturLearn (Brunel University London, the University of Roehampton), and the Institute for Study Abroad (IFSA), London. She holds a PhD in Behavioural Health Economics (Magna cum laude), an MSc in Health Economics and Management (First Class), and a BSc in Business, Politics and Law from the National Kapodistrian University of Athens. A Fellow of the Higher Education Academy and Chief Editor of the Journal of Politics and Ethics in New Technologies and AI, Dr. Efthymiou has authored 22 books and over 70 peer-reviewed publications with Springer, IGI Global, Nova Science, and Bentham Books. Her AI publications include AI, Ethics and the Future of Work, Human Wellbeing in the Age of Artificial Intelligence, co-edited volumes on Legal and Regulatory Impacts on AI Development and Ethical, Regulatory, and Intellectual Property Impacts on AI Development (2026), and chapters on AI governance, behavioural law, national security, and human-machine interaction. Dr. Efthymiou has delivered over 400 keynotes across 30 countries, including at the United Nations, and advises at the highest levels of policy and governance. She is a Member of the UK's All-Party Parliamentary Group on Artificial Intelligence and sits on the Advisory Council of the Harvard Business Review. She is also a member of AISB (The Society for the Study of Artificial Intelligence and Simulation of Behaviour) and of the Global Association of Applied Behavioural Scientists (GAABS) and a partisan expert for CLAIRE AI in France. In 2020, she was awarded the title Exceptional Woman of Excellence by the Women Economic Forum.

Dr. Jeyatheepan Jeyaretnam
SPITAL, Switzerland

Advancing patient care: Impact of multidisciplinary heart team collaboration and technology-driven decision-making in modern cardiology

Introduction: Modern cardiovascular care is rapidly evolving toward integrated, multidisciplinary management supported by advanced diagnostic and monitoring technologies. The “Heart Team” model, endorsed by the European Society of Cardiology, promotes collaborative decision-making in patients with complex coronary artery disease and heart failure. Despite its growing adoption, real-world data evaluating the combined impact of team-based care and digital technologies on clinical outcomes remain limited.

Objectives: This study aimed to assess whether a multidisciplinary Heart Team approach combined with technology-guided management improves clinical outcomes compared with standard care pathways.

Methods: We conducted a prospective cohort study including 250 patients treated at a Swiss tertiary care center between 2023 and 2024. Patients with complex coronary artery disease or heart failure were managed either through an integrated Heart Team model or conventional care. The multidisciplinary approach involved cardiologists, cardiac surgeons, imaging specialists, and heart failure experts. Technological integration included Fractional Flow Reserve Computed Tomography (FFR-CT), Intravascular Ultrasound (IVUS), and structured telemonitoring systems for continuous patient assessment.

The primary endpoint was Major Adverse Cardiovascular Events (MACE) at 12 months. Secondary endpoints included hospital readmissions and early detection of complications.

Results: Compared to standard care, the integrated Heart Team and technology-driven approach demonstrated a 15% reduction in MACE (HR 0.85; p=0.032), a 22% reduction in hospital readmissions (p=0.01), and significantly earlier detection of complications (p<0.001).

Conclusion: Multidisciplinary collaboration combined with advanced imaging and telemonitoring is associated with improved cardiovascular outcomes. These findings support broader implementation of integrated care models, particularly in high-risk and complex patient populations. Further randomized studies are warranted to validate these results and guide clinical practice.

Biography

Jeyatheepan Jeyaretnam is a physician based in Switzerland with a focus on cardiovascular medicine and innovation in clinical care delivery. His work centers on integrating multidisciplinary collaboration with advanced diagnostic technologies to improve patient outcomes in complex cardiac conditions. He is particularly interested in digital health, imaging-guided decision-making, and heart team models in modern cardiology. Jeyaretnam actively contributes to clinical research aimed at optimizing evidence-based, patient-centered cardiovascular care.

Dr. Jeyatheepan Jeyaretnam
SPITAL, Switzerland

Scalable solutions for global health: Bridging cardiovascular innovation and tropical medicine in underserved regions

Cardiovascular disease and tropical infections constitute a major and increasingly interconnected dual burden in underserved regions, particularly within low- and middle-income countries where healthcare systems remain fragmented and resource-constrained. This poster proposes a scalable and integrated healthcare framework that combines advances in cardiovascular medicine with tropical disease control strategies. By leveraging digital health technologies, community-based care models, and preventive public health interventions, the proposed approach aims to improve early detection, enhance treatment efficiency, and strengthen health system resilience. Ultimately, this framework seeks to reduce health disparities and improve long-term population health outcomes.

Background: Low- and middle-income regions are undergoing a rapid epidemiological transition characterized by a rising prevalence of cardiovascular diseases alongside persistent endemic tropical infections. These overlapping burdens place substantial pressure on already fragile healthcare systems. Fragmentation of services, limited diagnostic capacity, and weak integration between chronic and infectious disease programs contribute to delayed diagnosis, disrupted continuity of care, and suboptimal patient outcomes. Addressing these challenges requires a shift toward integrated, systems-based healthcare delivery models.

Objective: To develop and propose a scalable, cost-effective, and integrated healthcare model that bridges cardiovascular innovation with tropical medicine, with the aim of improving early detection, optimizing treatment pathways, and strengthening preventive care in resource-limited settings.

Key Themes:

Integrated Care Models: Development of unified screening and management pathways that combine cardiovascular risk assessment with infectious disease surveillance, enabling earlier diagnosis and coordinated treatment.

Digital Health Innovations: Application of telemedicine platforms, artificial intelligence–assisted diagnostic tools, and mobile health applications to expand access to care, improve clinical decision-making, and support remote patient monitoring.

Task-Shifting and Community Engagement: Strengthening the capacity of community health workers to deliver frontline screening, health education, and basic disease management, thereby extending healthcare access to underserved populations.

Preventive Health Strategies: Integration of cardiovascular risk reduction initiatives with established tropical disease prevention programs, emphasizing lifestyle modification, vaccination, and health education.

Health System Strengthening: Enhancement of primary healthcare infrastructure to support integrated service delivery, improve referral pathways, and increase system resilience against dual disease burdens.

Discussion: The integration of cardiovascular innovation with tropical medicine represents a significant opportunity to address persistent health inequities in underserved populations. Aligning chronic disease management with infectious disease control enables improved efficiency, earlier intervention, and more effective use of limited resources. Furthermore, the incorporation of digital health technologies and community-based delivery models enhances scalability and sustainability. However, successful implementation requires strong interdisciplinary collaboration among clinicians, public health practitioners, and health system policymakers.

Conclusion: A unified, scalable, and technology-enabled healthcare framework that integrates cardiovascular and tropical disease management offers a practical pathway to improving global health outcomes in resource-limited settings. This approach enhances clinical efficiency, promotes early diagnosis, and strengthens overall health system resilience. Future implementation and evaluation of such integrated models are essential to translate this framework into measurable and sustainable public health impact.

Biography

Jeyatheepan Jeyaretnam is a physician based in Switzerland with a focus on cardiovascular medicine and innovation in clinical care delivery. His work centers on integrating multidisciplinary collaboration with advanced diagnostic technologies to improve patient outcomes in complex cardiac conditions. He is particularly interested in digital health, imaging-guided decision-making, and heart team models in modern cardiology. Jeyaretnam actively contributes to clinical research aimed at optimizing evidence-based, patient-centered cardiovascular care.

João Rafael de Oliveira Rocha da Silva[1*], Mariana de Oliveira Rocha da Silva[2]

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Rehabilitation of patients with chronic pain and cardiovascular dysfunction

Chronic pain is associated with the leading cause of disability in the world, just as cardiovascular diseases represent the highest incidence of death in the world.

Both pathologies generate a high demand for health services and represent a high global population risk.

In previous studies, it was possible to observe a high incidence of the development of cardiovascular diseases in individuals with chronic pain, which was also correlated with the high incidence of the development of chronic pain in individuals with cardiovascular dysfunctions.

In order to better approach these patients, it is necessary to understand these pathologies better. For this reason, recent studies have observed pathophysiological changes and changes in motor control in individuals with chronic pain that must be evaluated and taken into account when developing rehabilitation protocols.

Knowledge of possible limitations and adaptations is necessary in individuals with heart disease, using treatment methods such as the practice of therapeutic exercises, which optimize functional capacity and improve the cardiovascular system, with the aim of optimizing the health and quality of life of these individuals, so that they have the physical capacities necessary to change habits and include the practice of physical activities.

We will discuss important aspects in the rehabilitation of individuals with chronic pain and cardiovascular dysfunction, in a multimodal manner, in an outpatient phase, highlighting the importance of prevention and treatment, presenting the main current scientific references.

Biography

Pt. João Rafael de Oliveira Rocha da Silva has been a clinical physiotherapist for over 15 years, with a postgraduate degree in rehabilitation applied to sport from the Department of Orthopedics and Traumatology at the Escola Paulista de Medicina CETE-UNIFESP, also having a postgraduate degree in Improvement in assessment and interdisciplinary treatment in Pain at the Hospital das Clínicas of the Faculty of Medicine of the University of São Paulo HC-FMUSP. He recently published five studies related to the treatment of Pain, which were presented at more than five international conferences and congresses. He also serves as a scientific reviewer for international journals.

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The exploration of lived experiences and the associated relationship with physical activity and exercise for individuals with ANOCA

Background: Angina with No Obstructive Coronary Artery disease (ANOCA) is an umbrella term encompassing multiple underlying pathologies. Unlike traditional Coronary Artery Disease (CAD), it is a complex condition, stemming from multifactorial structural and functional abnormalities within the coronary vasculature. There is a paucity of research exploring the lived experiences of those with ANOCA and the associated relationship with physical activity and exercise.

Aim: To investigate the lived experiences of individuals with ANOCA and the associated relationship with physical activity and exercise.

Methods: Semi-structured, online, individual phenomenological interviews were conducted with ANOCA patients, focusing on their lived experiences and subsequent relationship with physical activity and exercise. Prior Public Involvement in Research (PiR) work was completed to develop one-to-one interviews, aligning research with patient priorities. An inductive, approach was employed to capture the detailed narratives of the functional impact of ANOCA on patients' lives. Reflexive Thematic Analysis will be conducted to identity and explore themes. Findings will be validated via member checking and triangulation of data to enhance analytical rigour. Inclusion criteria were specified as adults (≥18 years), who had medically confirmed diagnosis under the umbrella term of ANOCA.

Results: 25 participants completed 1:1 interviews (M=3; 54.7±4 years, F=22; 58.1±8.6 years) from the UK, USA, Canada, Australia and Belgium. Initial findings suggest that patients self-report high fitness levels, holding very active lifestyles at the onset of condition symptoms. Patients report exertional symptoms triggered at specific heart rates, ranging from 100 to 140 bpm, which limits their exercise capacity and prevents the continuation of physical activity and exercise. Patients self-report clinical dismissal due to a perceived lack of provider knowledge, awareness and empathy regarding ANOCA. Patients report heightened anxiety and diminished trust in healthcare systems and medical personnel. Further analysis is planned.

Conclusion: This research may provide valuable insight into the relationship of those with ANOCA and physical activity, increase awareness of ANOCA, and support clinical decision making. This research will look to inform the co-design of physical activity and exercise programmes for ANOCA patients, considering symptom triggers, manageability and accessibility.

Biography

Kayleigh Jarrett is a presenting author at the 4th Edition of the International Heart Congress, Barcelona. Holding a First-Class degree in Applied Sport and Exercise Science from Robert Gordon University (RGU), Kayleigh is currently pursuing a Master's by Research at the same institution, funded by Digital Health and Care Innovation Centre, Scotland. Their work focuses on qualitative research exploring the lived experiences of individuals with ANOCA (Angina with No Obstructive Coronary Artery disease). Specifically, this research investigates the complex relationship between ANOCA, physical activity, and exercise, aiming to deepen the understanding of patient realities and support better cardiovascular well-being.

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Deciphering the cardioprotective mechanism of a natural compound in post-infarct mice: An integrative approach combining network pharmacology, *In vitro,* and *In vivo* validation

Herbs have long served as foundational sources of medicinal agents and continue to play a pivotal role in both traditional and modern pharmaceutical practices. Among these, several naturally derived compounds exhibit promising therapeutic potential against cardiovascular diseases. This study investigates the cardioprotective effects of a natural compound against Acute Myocardial Infarction (AMI), elucidating its molecular mechanisms through a comprehensive integrative approach combining insilico, in vitro, and in vivo analyses. Cardioprotective role of a natural compound in AMI by identifying its key targets and signaling pathways using a network pharmacology framework supported by experimental validation. A network pharmacology-based analysis was conducted using public databases such as PubChem, IMPPAT, SwissADME, SwissTargetPrediction, GeneCards, DisGeNET, and PubMed to identify bioactive compounds, predict biological targets, and associate them with cardiovascular diseases. Visualization and integration of compound-target-disease networks were performed using Cytoscape. Functional annotation through Gene Ontology (GO) and KEGG pathway enrichment analyses was done using the david database. Protein–Protein Interaction (PPI) networks were constructed via string, and key targets were selected for molecular docking using AutoDock 4.2.6. Molecular dynamics simulations over 100 ns were performed to validate the stability of ligand-target interactions.

In vitro assays using H9c2 cardiomyoblast cells included MTT assay for cytotoxicity, ROS assay for oxidative stress, JC-1 dye for Mitochondrial Membrane Potential (MMP), Annexin V/PI staining for apoptosis, and untargeted metabolomic analysis via LC-MS to identify metabolic alterations under treatment.

In vivo validation was carried out using a mouse model of isoproterenol-induced myocardial infarction. Cardioprotective effects were evaluated by echocardiography to assess cardiac function, histopathological examination to assess tissue architecture, Immunohistochemistry (IHC) for localization of key proteins, and Western blotting to quantify expression of signaling proteins involved in apoptosis and MAPK pathways (e.g., p-ERK, p-JNK, p-P38, caspase-3,). The network pharmacology analysis revealed 328 potential targets associated with the natural compound. Key proteins included TNF, AKT1, EGFR, ERK, JNK, HIF1A, and P38 MAPK. Molecular docking confirmed strong binding affinities with these targets, and molecular dynamics simulations verified the stability of interactions. In vitro results showed that the compound significantly improved cell viability, reduced ROS generation, maintained mitochondrial integrity, and decreased apoptotic cell populations. Metabolomic profiling indicated modulation of metabolic pathways related to energy metabolism and oxidative stress. In vivo findings demonstrated improved cardiac function via echocardiography and reduced tissue injury and fibrosis. Western blot and IHC analyses confirmed regulation of signaling pathways involved in inflammation, apoptosis, and cell survival. This integrative study demonstrates the cardioprotective efficacy of a natural compound through modulation of multiple molecular pathways associated with myocardial infarction. The synergistic use of computational modeling, in vitro cell-based assays, and in vivo animal studies provides robust evidence supporting its potential as a therapeutic agent for cardiovascular diseases.

Biography

Ms. Krishna Priya Jha is a Ph.D. research scholar in the Department of Pharmacology and Toxicology at NIPER-Hajipur. Her ongoing research focuses on investigating the cardioprotective effects of a natural product in myocardial infarction, including the development and evaluation of a novel formulation. She has hands-on experience in in silico, in vitro, and in vivo methodologies. She has published a review article and has one research manuscript under communication. Ms. Jha completed her Master's degree in Pharmacology from Babasaheb Bhimrao Ambedkar University, Lucknow. Her research interests include natural product pharmacology, cardiovascular therapeutics, and formulation development.

Maria Antonette B. Gelindon[1*] M.D, Vianney Berwyn F. Flores[2] M.D, Edwin S. Tucay[2] M.D, Romeo J. Santos[2] M.D, Emmet VI Ladlad–Pua[2] M.D, Maria Christie Mendoza–Reyes[2] M.D, Eleonor A. Lopez[7] M.D

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Determination of significant change in right ventricular strain among patients with rheumatic mitral stenosis after percutaneous transvenous mitral commissurotomy

Introduction: Application of strain echocardiography in Rheumatic Mitral Stenosis (MS) allows new insight in evaluation of cardiac function. The aim of this paper is to describe the significant change in Right Ventricular (RV) strain among patients with Rheumatic MS after Percutaneous Transvenous Mitral Commissurotomy (PTMC).

Methods: This prospective cohort study was conducted between July 2023 to November 2024 in a tertiary hospital. Participants are adult Filipinos aged 19 years old and above with Severe Rheumatic MS who underwent PTMC from July 2023 to November 2023. Participants were followed up one year after PTMC. Applications of RV strain were done on 2D Transthoracic Echocardiogram before PTMC, one day post-PTMC and one year post-PTMC thru 2D speckle tracking using Siemens echocardiography machine. The RV strain and echocardiographic parameters were reviewed by an echocardiographer level III consultant blinded with clinical data and results. Paired Sample T-test, Wilcoxon Sign rank test, and McNemar test were used to determine differences between outcomes pre-and post-procedurally.

Results: A total of 18 adult Filipino female patients were analyzed. Based on NYHA classification, majority (88.89%, n=16/18) were classified as class II, with the remainder (11.11%, n=2/18) in class I. The global longitudinal RV strain improved from-13.99±3.04% pre-PTMC to-16.36±3.35% on day one post–PTMC (p<0.001) and-18.79±4.56% at one year post-PTMC (p<0.001). Free wall strain showed improvement one year post–PTMC (-22.27±6.19%, p=0.001). Segmental RV strain analysis also showed significant improvement at one year post-PTMC in the lateral apex (-21.43±10. 01%, p=0.008), lateral mid (-21.51+8.80 %, p=0.004) and septal base (-17.78± 4.82 %, p=0.019).

Conclusion: Right ventricular strain analysis revealed significant enhancements following PTMC. Significant improvements in global and segmental RV strain showed right ventricular functional recovery. These findings advocate the applications of RV strain as an additional parameter for right ventricular assessment of patient with rheumatic MS before and after PTMC.

Keywords: Severe Mitral Stenosis, Percutaneous Transvenous Mitral Commissurotomy, Right Ventricular Longitudinal Strain.

Biography

Maria Antonette B. Gelindon is a graduate of Doctor of Medicine from Our Lady of Fatima University in the Philippines. She Passed the Physician Licensure examination in the Philippines in 2007, Maria Antonette worked in a district hospital in Oriental Mindoro, Philippines with utmost dedication and commitment in patient care. After eight years of medical government service, Maria Antonette trained and completed her 3-year residency training program in Internal Medicine at Jose R. Reyes Memorial Medical Center, Manila, Philippines in 2018. She also completed her 3-year Adult Cardiology fellowship training in April 2023 and a 1-year Non-invasive Adult Cardiology subspecialty fellowship in October 2024, at the Philippine Heart Center, Quezon City, Philippines. During her clinical research fellowship in non-invasive adult cardiology training, Maria Antonette acquired hands-on skills and knowledge in different non-invasive and invasive cardiac diagnostics which have significant contribution in managing adult cardiovascular diseases.

Maria Teresa Carvallo Marin
University of Chile, Chile

Perception of cardiovascular risk in women after a rehabilitation program

Introduction: After suffering a serious Cardiovascular event (CV), cardiac rehabilitation is a process in which the patient establishes a close through a post-CV rehabilitation process. Stress was mentioned as the main CV risk factor (57%). Only 29% of responders subsequently carried out acti-relationship with the medical team, providing an opportunity to learn about psychosocial factors that influence cardiac outcome and eventual learnings from the experience. The objective of this study was to learn about women's perception of their own health after participating in a cardiac rehabilitation program.

Method: 35 women from 35 to 75 years of age with varying educational level, household income and employment status were invited to participate. Data was collected through semi-structured face-to-face interviews.

Results: Women mentioned breast cancer as the vities aimed at their management and control. The most common motivations for making changes in habits, were family care (29%), living longer (26%) and a desire to feel better (23%).

Conclusion: These results suggest the need for a more comprehensive education in women during rehabilitation, promoting not only healthier habits from a physical but also from a psychological points of view. The introduction of stress management into CV prevention and rehabilitation programs is suggested.

Keywords: Cardiovascular Health, Cardiac Rehabilitation, Stress, Risk Factors, Women Cause of Death (60%) Despite Having Gone.

Biography

Maria Teresa Carvallo is a physical therapist who graduated from the University of Chile in 1983. In 2013, she earned a Master's degree in Humanities and Scientific Thought. In 1990, Maria joined the Clínica Alemana in Santiago de Chile (CAS), where she worked as a kinesiologist, head of the Rehabilitation Program, and taught undergraduate and graduate students in the Cardiovascular, Pulmonary, and Metabolic Rehabilitation Program, both at CAS and the Universidad del Desarrollo (UDD). Maria has conducted research in the field of women's cardiovascular health and has participated in numerous national and international conferences. Since 2020, she has been practicing independently, offering specialized online kinesiology care.

Faezeh Mobasheri-Shiri[1], Zahra Azizi[2], Maryam Mobasheri-Shiri[2*], Zeinab Karimimoghadam[3,4], Navid Alinejad[4], Sepehr Ramezanipour[2], Abdulhakeem Alkamel[5], Mahdi Ravankhah[6], Sina Kardeh[7], Reza Tabrizi[4]

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Associations between exposure to air pollutants and QT interval change: A comprehensive systematic review

Statement of the Problem: Air pollutants can affect the human cardiovascular system, but their impact on cardiac conduction remains unclear. We have undertaken a systematic review to compile the existing evidence.

Methodology & Theoretical Orientation: We conducted a comprehensive search across the MEDLINE/PubMed, Embase, Scopus, Cochrane Library, and Web of Science databases to identify all pertinent studies published before January 2025, that quantitatively assessed the effect of air pollutants including particulate matter with diameter ≤1, 2.5 or 10μm (PM1, PM2.5 or PM10), Ozone (O3), Nitrogen Dioxide (NO2), Sulfur Dioxide (SO2), Carbon Monoxide (CO), Elemental Carbon (EC), Organic Carbon (OC), and Black Carbon (BC) on QT interval.

Conclusion & Significance: A total of 24 articles, involving 174,526 participants, met the inclusion criteria. The majority of studies demonstrated that exposure to various air pollutants was associated with an increased risk of QT prolongation. In contrast, some studies reported a reverse association for pollutants such as PM2.5, PM10, EC, and NO2. Existing evidence highlights the relationship between exposure to air pollutants and adverse effects on the QT duration. Individuals at risk of cardiac diseases should take measures to reduce their exposure to air pollutants.

Biography

Maryam Mobasheri Shiri is a medical doctor and as a physician, she is first handed in cardiovascular diseases. Beside clinical experience, Maryam tends to do research in the cardiometabolic field. Nowadays, air pollution is a global matter that affects cardiac system. She wants to explore more about this relationship, so she did a systematic review research on the association between air pollution and QT interval, to comprehensively investigate this association. This article has been published a couple of months ago.

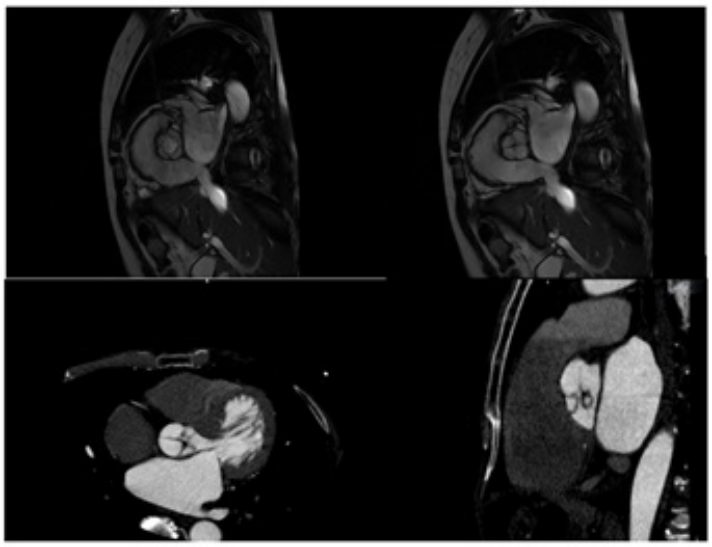
Muhammet Vasfi Gökay*, Şule Gülseven Çiftçi, Yetkin Korkmaz
Sultan Abdülhamid Han Training and Research Hospital, Turkey

Incidental detection of Quadricuspid Aortic Valve (QAV) on coronary CT angiography: A multimodality imaging case

Introduction: Quadricuspid Aortic Valve (QAV) is an exceedingly rare congenital cardiac malformation, with an estimated incidence of 0.008% to 0.043%. It is primarily characterized by the presence of four functional cusps, which often leads to progressive Aortic Regurgitation (AR) due to incomplete leaflet coaptation. While often asymptomatic during early life, it frequently manifests in the fifth or sixth decade with symptoms related to hemodynamic dysfunction.

Case Presentation: A 62-year-old female with a long-standing history of hypertension presented with recurrent palpitations and exercise intolerance. Initial cardiovascular assessment via Transthoracic Echocardiography (TTE) iniki separate clinical centers revealed mild-to-moderate aortic regurgitation and a dilated ascending aorta (39-40mm); however, the valve's structural morphology was reported as unremarkable. Due to the patient's symptoms and the need to exclude coronary artery disease, coronary CT Angiography (CTA) was performed. CTA successfully identified a quadricuspid aortic valve with four equal-sized leaflets (Hurwitz & Roberts Type A), forming a characteristic "X" shaped coaptation during diastole. To further quantify the valvular dysfunction, Cardiac Magnetic Resonance (CMR) imaging was utilized. CMR confirmed the quadricuspid structure and, through phase-contrast sequences, accurately measured a regurgitant fraction of 15%, correlating with moderate AR. Furthermore, CMR provided a definitive assessment of the non-aneurysmal yet dilated ascending aorta. Following these advanced imaging findings, a targeted echocardiographic re-evaluation by a senior consultant confirmed the QAV diagnosis, which had been overlooked in initial screening.

Conclusion: This case underscores the diagnostic challenges of QAV, particularly when symmetric leaflet morphology leads to false-negative results on routine TTE. It highlights the indispensable role of Coronary CTA not only for coronary evaluation but also for comprehensive valvular assessment. Multimodal imaging, combining the anatomical precision of CT with the quantitative functional gold standard of CMR, is crucial for the accurate diagnosis and long-term management of rare congenital valvular anomalies.



Biography

Dr. Muhammet Vasfi Gökay is a Radiologist currently practicing at Mus State Hospital, Turkey. Gökay completed his radiology residency at Sultan Abdülhamid Han Training and Research Hospital in Istanbul. Gökay's professional interests are focused on cardiovascular imaging and the clinical applications of Cardiac CT and MRI. Gökay is particularly interested in the role of multimodal imaging in the diagnosis of congenital cardiac anomalies and valvular heart diseases.

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Almazov National Medical Research Center, Russian Federation

Strategy for reducing cardiovascular risk in patients with obesity through personalized physical training

Relevance: Obesity is a leading modifiable risk factor for Cardiovascular Diseases (CVD). Despite the recognized role of Physical Activity (PA) in the treatment of obesity, existing recommendations are general in nature, which reduces their effectiveness and safety. Determining an optimal, individually tolerable and effective regimen of aerobic training is a key element of a personalized strategy for reducing cardiometabolic risk.

Aim: To evaluate the effectiveness of a strategy for reducing cardiovascular risk based on a personalized selection of an aerobic training regimen in patients with obesity.

Materials and Methods: A single-center open-label randomized study involving 37 patients (average age 25 years) with alimentary obesity (BMI>30kg/m^2) and without significant cardiovascular pathology. Based on Cardiopulmonary Exercise Testing (CPET) with determination of peak oxygen consumption (VO_2peak) and Lactate Threshold (LT), patients allocated into 3 groups differing in walking training intensity: 1) Low intensity (25-30% of VO_2peak, n=15), 2) moderate intensity (60% of VO_2peak, n=15), 3) high intensity (75-80% of VO_2peak, n=7). Training continued for 6 months. Dynamics of cardiometabolic risk markers were assessed: Body Mass Index (BMI), Waist Circumference (WC), Exercise Tolerance (ET by VO_2peak), walking speed at LT, duration of the predominant fat oxidation phase (RER=0.70-0.75), as well as the frequency of Adverse Events (AE).

Results: Recruitment into the high-intensity group terminated early due to poor tolerance. After 6 months, group 1 (low-intensity training, 25-30% VO_2peak) showed the greatest reduction in cardiometabolic risk markers: BMI decreased by 8% ($p<0.05$), group 2-5%

(p<0.05), and group 3-3% (p>0.05); WC in group 1 decreased by 2.5% (p<0.05), in groups 2 and 3 by 1.7% (p<0.05). The maximum improvement in the functional reserve of the cardiovascular system was noted in group 1 patients: VO_2peak increased by +22% (p<0.05), in group 2 VO_2peak increased by an average of 15% (p<0.05), while no dynamics in VO_2peak were registered in group 3 patients. Walking speed at LT increased in group 1: +41% (p<0.05), in group 2: +39% (p<0.05); in group 3, patients performing high-intensity interval training showed a decrease in walking speed at LT by an average of 28% (p<0.05). A prolongation of the predominant fat oxidation phase (RER=0.7-0.75) by 5times was recorded, indicating optimization of the metabolic profile. The duration of the RER phase at the level of 0.7-0.75 increased on average from 0.4min to 2min (p<0.05) in group 1 and to 1.1min (p<0.05) in group 2. No similar dynamics were registered in group 3. Group 1 showed no serious AEs and demonstrated the best treatment adherence (100%). Training of moderate and high intensity was associated with a higher frequency of AEs (muscle pain, shortness of breath, exercise intolerance).

Conclusions: 1. Personalized training with intensity at the lactate threshold (25–30% of VO_2peak) is the cornerstone of a safe and effective strategy for obesity correction. 2. This strategy demonstrates the best safety and tolerability profile, which is important for long-term adherence; and provides comprehensive reduction of cardiovascular risk through a significant decrease in abdominal obesity, improvement in the functional state of the cardiorespiratory system, and optimization of metabolism towards predominant fat utilization.

Biography

N.K. Shelukhanov is the Head of the Department of Restorative Treatment and Medical Rehabilitation at the University Clinic of the Federal State Budgetary Institution "V.A. Almazov National Medical Research Center" of the Ministry of Health of the Russian Federation Rehabilitation Physician, Physiotherapist as well as a Member of the Expert Council of the Association for the Development of Rehabilitation, Physiotherapy and Ablitation.

Dr. Narayanan Gokarneshan

Formerly Professor, Department of Textile Chemistry, SSM College of Engineering, Komarapalayam, Tamil Nadu, India

New textile materials in cardiovascular tissue replacement and repair

In cardiovascular therapeutics, procedures such as heart transplants and coronary artery bypass graft are pivotal. However, an acute shortage of organ donors increases waiting times of patients, which is reflected in negative effects on the outcome for the patient. Post-procedural complications such as thrombotic events and atherosclerotic developments may also have grave clinical implications. To address these challenges, tissue engineering is emerging as a solution, using textile technologies to synthesize biomimetic scaffolds resembling natural tissues. This comprehensive analysis explains methodologies including electrospinning, electrostatic flocking, and advanced textile techniques developed from weaving, knitting, and braiding. These techniques are evaluated in the context of fabricating cardiac patches, vascular graft constructs, stent designs, and state-of-the-art wearable sensors. We also closely examine the interaction of distinct process parameters with the biomechanical and morphological attributes of the resultant scaffolds. The research concludes by combining current findings and recommendations for subsequent investigation.

Biography

Dr. N. Gokarneshan obtained his PhD in Textile Technology. He has more than 25 years of experience in education and over 10 years in industry. Has authored 22 books, published about 250 papers in leading journals, presented papers in many conferences, contributed book chapters to edited books. Gokarneshan is recipient of a number of awards and recognitions for noteworthy contributions in his field. He has made contributions in multidisciplinary areas of engineering and medicine. His areas of expertise include Technical textiles and nano technology in textiles.

Nawaf AM Alharbi*, Khawaja Husnain Haider PhDZ

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ECHO-VIEWER: An AI-platform for real-time echocardiography data interpretation in experimental and clinical settings

Background: Transthoracic Echocardiography (TTE) remains the mainstay non-invasive modality for cardiac assessment in clinical practice and experimental HF models, with over 7 million U.S. studies/year. However, interpretation is constrained by image quality, foreshortened or incomplete loops, suboptimal endocardial borders, and operator variability. In preclinical studies, small hearts, rapid rates, and subtle pre- and post-therapy remodeling create a diagnostic gap that conventional 2D-TTE cannot consistently resolve through real-time quality control and 3D interpretation.

Aim: To develop and externally validate ECHO-VIEWER, a quality-gated, human-in-the-loop hybrid AI platform for real-time TTE acquisition guidance, functional/structural interpretation, clinician feedback, and 3D visualization across clinical and preclinical workflows.

Methods/Approach: A CNN-based model was trained on 10,000 MIMIC-IV-ECHO/PhysioNet-derived 2D-TTE cine loops and externally validated on 1,276 Stanford echo clips. Before quantitative reporting, predefined quality and cycle-completeness criteria were applied, including LV/endocardial-border visibility, foreshortening, artifact/dropout/cropping, and ED/ES frame detectability. This adjudication identified 1,037 diagnostic-quality clips for primary analysis. Outputs included LVEF, EDV, ESV, fractional shortening, chamber quantification, septal wall-motion review, valvular-abnormality screening, and 3D reconstruction. A clinician-in-the-loop interface enabled expert accept/reject/edit decisions, with corrections archived for CNN refinement. Feasibility was explored in paired pre- and post-stem-cell murine studies (n=12) and in human cases. LVEF was compared

with the reference clinical LVEF using MAE, RMSE, Pearson r, Bland-Altman analysis, and ±5- and ±10-point agreement.

Results: In the diagnostic-quality external validation cohort, LVEF estimation achieved an MAE of 2.72 points, an RMSE of 3.24 points, and a strong correlation with the reference LVEF (r=0.958). Bland-Altman analysis demonstrated near-zero mean bias (0.05 points), with 95% limits of agreement from -6.30 to +6.39. Estimates were within ±5 LVEF points in 86.11% and within ±10 points in 100%. The platform translated 2D echocardiographic data into expert-reviewable functional, chamber, septal, valvular-screening, and 3D outputs while mitigating the effects of unreliable reporting due to inadequate or incomplete loops.

Conclusion: In external validation, ECHO-VIEWER demonstrated strong agreement for LVEF estimation and extended 2D-TTE into a quality-controlled, clinician-supervised, 3D-enabled workflow for patients and experimental models before and after stem-cell therapy interventions, with future expansion toward M-mode, Doppler hemodynamics, and 4D valve-focused analysis.

Biography

Nawaf AM Alharbi is a medical student at Sulaiman Al Rajhi University with a strong focus on cardiovascular medicine, medical AI, and translational innovation. Nawaf developed a registered AI-based echocardiography project and has been recognized for contributing independent AI educational models across internal medicine, neurology, neuroanatomy, and pharmacology. Nawaf holds First Aid Provider, BLS, and ACLS certifications, with additional continuing education from Stanford Medicine and HarvardX. Nawaf's work aims to connect clinical training, emergency-care readiness, and explainable AI into scalable tools for real-world healthcare challenges.

Niranjan Nisty, Nidhish Niranjan Nisty*, Shivaling Niranjan Nisty
Nisty Heart Centre, Kalaburagi, Karnataka, India

A study of clinical profile of raised NT-proBNP in elderly patients with good LV systolic function

Introduction: NT-proBNP (N-terminal pro-B-type Natriuretic Peptide) is a blood test used mainly to diagnose and monitor heart failure. It measures a hormone released by the heart when the heart muscle is stretched due to increased pressure or fluid overload.

Methodology: The aim of this study was mostly to assess the profile of 25 elderly patients with raised NT pro BNP in elderly patients with good LV systolic function at our centre located in Kalaburagi, India and also studied in details with the various associations.

Results: Out of 25 participants, 15 patients (60%) were females and 10 patients (40%) were males. The mean age 6 patients (24%), coronary artery disease in 2 was 69.68±9.70 years and ranging from 60–95 years. All participants presented with shortness of breath and 1 patient (4%) had cough. Hypertension was present in 7 patients (28%), diabetes mellitus in patients (8%), chronic kidney disease in 1 patient (4%) and 2 patients has malignancy (8%). Left ventricular hypertrophy was observed in 4 patients (16%), trivial mitral regurgitation in 2 patients (8%), and tricuspid regurgitation in 1 patient (4%). The mean NT-proBNP level among participants was 2384.84±2707.67pg/mL.

Conclusion: NT-proBNP is excellent diagnostic tool to diagnose the heart failure, its severity and also monitor the treatment especially in elderly individuals with good LV systolic function. It's a must in evaluation of shortness of breath. It detects diastolic dysfunction effectively especially in elderly patients.

Biography

Dr. Nidhish Nisty is consultant Physician and Administrator at Nisty Heart Centre, Kalaburagi. Studied MBBS and M.D Internal Medicine at MRMC, Kalaburagi. Dr. Nidhish has secured highest grades at college in Internal Medicine and has been awarded gold medal in MBBS. Also a co-author for many abstracts which were selected at EuroPCR at paris 2020 during his post-graduation and also at IHC Japan 2023, IHC Paris 2024 and IHC 2025, Rome. Dr. Nidhish has also various presented posters in India. He has widely travelled, about 24 countries.

Nilay Solanki*, Riddhi Patel

Department of Pharmacology, Ramanbhai Patel College of Pharmacy, Charotar University of Science and Technology, CHARUSAT Campus, Changa, Gujarat, India

Assessment of cardiovascular risk and prescribing patterns in cardiac patients attending tertiary care hospital in India

Background: Cardiovascular Diseases (CVDs) are major health problem throughout the world and common cause of premature morbidity and mortality. Today CVD accounts for approximately 30% deaths worldwide including nearly 40% in high income countries and about 28% in middle and low income countries.

Aim: Study of prescribing pattern for cardiovascular condition at multispecialty hospital.

Method: Prospective observational study was conducted in cardiovascular conditions for the period of eight months. Study related data was collected in Case record form. Data analysis was done by evaluating trends of drug usage.

Result: Two Hundred cases were registered and evaluated, out of that 126 were male and 74 were female cases. The mean age range for patients was 59.62±11.61 years. In case of Hypertension 90 cases were registered (45%) and 53(26.5%) cases for coronary artery disease, while 37(18.5%) patients were reported with Congestive Heart Failure (CHF). Patients of coronary artery disease with Congestive Heart Failure (CHF) were 23(11.5%). In our study Clopidogrel and aspirin were prescribed frequently, followed by atorvastatin (85%). Average number of drugs prescribed was 6.79 per patient. Percentage of drugs prescribed by generic name was 10.28%.

Conclusion: The present study provided valuable insight about the overall pattern of CVS drug prescribed in cardiac conditions; however rationality of prescription could add more insight for the study.

Keywords: Cardiovascular Condition, Pattern of Prescription, Clopidogrel, Atorvastatin.

Biography

Dr. Nilay Solanki is an Associate Professor at Ramanbhai Patel College of Pharmacy, CHARUSAT, India, with over 18 years of expertise in Pharmaceutical Sciences and Pharmacology. Dr. Nilay research focuses on preclinical and clinical studies related to diabetes, cancer, neurodegeneration, etc. and collaborates with multispecialty hospitals for clinical research and has published over 80 papers in high-impact journals. Dr. Solanki has received numerous awards and has served as a resource person at national and international conferences. Dr. Nilay Solanki is also an editor and reviewer for reputed journals and has completed various consultancy projects.

Dr. Prashant Sakharam Bhokardankar

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Embracing Ayurveda: A new era in heart disease care

The prevalence of Cardiovascular Diseases (CVDs) has significantly increased in recent years due to environmental changes, heavy diets, and lifestyle modifications. As a result, the term "hridroga," which refers to heart-related conditions in Ayurveda, has grown in popularity. Heart attacks, peripheral artery disease, rheumatic heart disease, congenital heart disease, heart failure, hypertension, coronary heart disease, and cerebrovascular diseases like stroke are all included in the broad category of Cardiovascular Diseases (CVDs). According to Ayurveda, imbalances in the three doshas are the main cause of heart-related illnesses, and treating CVDs involves a difficult task of reestablishing their equilibrium. Throughout history, herbal treatments have been an essential part of human healthcare, with many traditional medical systems using them to treat a wide range of illnesses. One of the oldest and most well-known traditional medical systems in the world is Ayurveda. Through interventions pertaining to diet (Ahara), lifestyle (Vihara), seasonal routines (Ritucharya), yoga, everyday routines (Dinacharya), and rejuvenation therapies (Rasayana), this review paper examines the critical role Ayurveda plays in preventing, controlling, and evaluating CVDs. The study clarifies how Ayurveda's all-encompassing method tackles the underlying causes of CVDs and provides insightful information about lifestyle changes, herbal remedies, and preventative measures. This review attempts to offer a thorough perspective on the potential of Ayurveda in addressing the growing prevalence of cardiovascular problems in contemporary society by combining traditional wisdom with current scientific understanding.

Biography

Dr. Prashant Bhokardankar is not just a leading figure in the field of Ayurveda; he is a trailblazer redefining the realms of traditional medicine. With MD in Ayurveda specializing in Rasshastra from the prestigious Govt. Ayurveda College Nanded India, Dr. Bhokardankar has dedicated his career to advancing the pharmaceutical aspects of Ayurveda since 2005. As a dynamic Professor and Head of the Department at DMAMCHRC Nagpur, he inspires the next generation of Ayurvedic practitioners while simultaneously contributing to the global discourse on traditional medicine. His impressive tenure includes impactful roles at renowned pharmaceutical companies such as Dabur and Arya Vaidya Pharmacy, where he honed his expertise in the Ayurveda pharma sector. Dr. Bhokardankar is a prolific researcher, with numerous national and international publications in indexed journals to his name. His commitment to the field extends beyond academia, as he has organized various seminars and workshops, passionately sharing the wisdom of Ayurvedic medicine. As a sought-after speaker at international conferences across Spain, France, Italy, and Dubai, Dr. Bhokardankar continues to bridge the gap between ancient wisdom and modern science, showcasing the relevance of Ayurveda on a global platform. His work as a principal investigator on multiple funded research projects further underscores his dedication to advancing Ayurvedic pharmaceutical knowledge. With his extensive experience and visionary outlook, Dr. Bhokardankar trulyembodies the spirit of innovation within the world of Ayurveda.

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Altered p53 gene expression in coronary artery disease patients with dyslipidemia: Implications for atherogenesis

Introduction: A concerning increase in Coronary Artery Disease (CAD) among younger Indians calls attention to genetic biomarkers that indicate early vascular stress. The tumor suppressor gene p53, known primarily for its oncogenic role, also modulates vascular apoptosis and inflammation. However, its link with metabolic and nitrosative stress in CAD remains underexplored.

Aim: To determine the potential of p53 as an integrated biomarker and to analyze the connection between p53 gene expression, lipid abnormalities, inflammatory (IL-6) and nitrosative (3-nitrotyrosine) markers in CAD.

Methods: In this case-control study, 90 CAD patients and 90 age-matched healthy controls (18–50 years old) participated. Enzymatic techniques were used to evaluate lipid profile parameters, RT-PCR was used to detect p53 gene expression ($2^{-\Delta\Delta Ct}$ method), and ELISA was used to quantify the levels of Interleukin-6 (IL-6) and 3-Nitrotyrosine (3-NT). Data were analyzed with t-test, Mann–Whitney U, chi-square, and Pearson correlation ($p<0.05$).

Results: CAD subjects showed higher total cholesterol, triglycerides, LDL-C, IL-6, and 3-NT, and lower HDL-C compared with controls (all $p<0.01$). p53 was up-regulated 1.6-fold in CAD and correlated positively with 3-NT ($r=0.709$, $p<0.001$) and IL-6 ($r=0.513$, $p<0.01$).

Conclusion: This is the first Indian case-control study to integrate p53 gene expression with lipid, inflammatory, and nitrosative markers in relatively young CAD patients, offering a novel molecular perspective on early atherogenesis.

Keywords: Atherosclerosis, Coronary Artery Disease, Dyslipidemia, Inflammation, Nitrosative Stress, P53 Gene.

Biography

Mrs. Reshma Gopan M is an Assistant Professor with a background in perfusion technology and a postgraduate specialization in physiology. Her research focuses on oxidative-nitrosative stress, inflammatory biomarkers, and p53 gene expression in coronary artery disease. Reshma has contributed to biomarker profiling studies for early detection and prognosis of atherosclerosis using RT-PCR and ELISA techniques. Actively involved in teaching and research, she is committed to advancing translational approaches in cardiovascular health.

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Predictors of sudden death in congenital arrhythmogenic syndromes

Genetic heart diseases are common causes of Sudden Cardiac Death (SCD) in the young and are typically divided into inherited cardiomyopathies and primary electrical heart diseases. Cardiomyopathies associated with the risk of SCD include Hypertrophic Cardiomyopathy (HCM) and Arrhythmogenic Cardiomyopathy (ACM). The latter includes Arrhythmogenic Right Ventricular Cardiomyopathy (ARVC). Primary electrical diseases more commonly seen in clinical practice include Brugada Syndrome (BrS) and Long QT Syndrome (LQTS). Risk stratification of SCD is a central component of the management of patients with these genetic heart diseases. Numerous risk factors have been identified, and risk prediction models have been developed to estimate the absolute risk of sustained arrhythmias and SCD to support clinicians and patients in decision-making regarding prophylactic Implantable Cardioverter-Defibrillators (ICDs). This lecture provides a practical review of the current literature on risk stratification in ARVC and other ACMs, HCM, BrS, and LQTS, and summarizes current recommendations for ICD use.

Biography

Samir Rafla is an Emeritus professor of cardiology, Alexandria Univ. He serves as Assessor (grader) in the National Council for Promotion of Professors in Cardiology. Samir is a Fellow of the American College of Cardiology (FACC) an Emeritus Fellow, European Society of Cardiology (FESC) and a Fellow Heart Rhythm Society (FHRS). He is a Member of the Heart Rhythm Society EHRA. Samir is a senior member of the Egyptian Society of Cardiology and he has more than 100 publications indexed on Google Scholar.

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Atypical takotsubo cardiomyopathy presenting as ST-Elevation Myocardial Infraction (STEMI)

A 64-year-old woman with a history of diverticulosis and duodenal ulcer presented with classic signs and symptoms of ST-Elevation Myocardial Infarction (STEMI), including chest pain typical of cardiac origin, ST elevations on ECG, and raised cardiac biomarkers. She was a former smoker with a family history of heart disease but lacked other common cardiovascular risk factors like hypertension, diabetes, or high cholesterol. She also reported recent emotional stress related to a friend's cancer diagnosis. Initially, her presentation was considered a routine STEMI. However, on admission (day 0), coronary angiography showed no obstructive coronary artery disease. Left ventricular angiography revealed mid-ventricular ballooning with a normal apex. An echocardiogram on day 1 showed normal left ventricular size but impaired systolic function with an Ejection Fraction (EF) around 45% and regional wall motion abnormalities.

Cardiac MRI on day 5 demonstrated normal cardiac size and function but hypokinesia in mid-to apical anteroseptal and anterior walls with a normal apex, along with mild oedema, patchy late gadolinium enhancement, and elevated T1 values. These findings suggested atypical Takotsubo Cardiomyopathy (TTC) with apical sparing or regional myocarditis. Improvement in EF from 45% to 63% over several days, absence of viral symptoms, and no pericardial effusion supported reversible ventricular dysfunction consistent with TTC.

She improved significantly in hospital, with normalization of left ventricular function. Treatment included beta-blockers, and ramipril was planned once blood pressure stabilized. She was followed locally and resumed normal activities.

This case highlights the need to consider stress-induced cardiomyopathy in acute coronary syndrome presentations with normal coronaries, recognizing that TTC can present atypically without typical apical ballooning.

Biography

Sana Tariq is a Tier 1 Resident Doctor in Cardiology at Manchester University NHS Foundation Trust. She is gaining clinical experience in cardiology with a particular interest in stress-induced cardiomyopathies. Sana has recently submitted a case report on atypical Takotsubo cardiomyopathy to Cureus Journal, a PubMed-indexed publication. The abstract she is presenting at this conference is based on the same case report. Sana is committed to furthering her clinical knowledge and contributing to academic discussions through case presentations.

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Antibodies with functionality as a new generation of translational tools designed to monitor autoimmune myocarditis at clinical and subclinical stages

Catalytic Abs (catAbs) are multivalent Immunoglobulins (Igs) with a capacity to hydrolyze the AntiGenic (Ag) substrate. In this sense, proteolytic Abs (Ab-proteases) represent Abs to provide proteolytic effects. Abs against Cardiac Myosin (CM) with proteolytic activity exhibiting targeted cleavage of CM molecule are of great value to monitor stages of autoimmune inflammation in patients with Autoimmune Myocarditis (AIM) and persons-at-risk.

Meanwhile, AIM can be defined as the autoimmune inflammatory process affecting the muscular tissues of the heart (myocardium), which is being transformed in a stepwise manner into Dilated Cardiomyopathy (DCM).

New targeted therapies for autoimmune and inflammatory diseases (including AIM) would require greater understanding of a patient or a person-at-risk to get the therapy personalized for those subsets, for specific biomarkers and the targets. In this sense, the identification and implementation of diagnostic, predictive and prognostic biomarkers remain the Holy Grail of platforms and protocols which are the crucial for Personalized & Precision Medicine (PPM).

AIM is just one of the chronic organ-specific autoimmune diseases resulting in a destruction of cardiac tissue by different tools, including highly aggressive and destructive autoAbs. A grand role in the development of autoimmunity in AIM, in particular, is the exposure of self-Ags, which are encrypted and unavailable to the immune system under physiologic conditions. Meanwhile, CM is one of the most important self-targets in AIM.

The primary damage in AIM progression is mediated by anti-CM autoAbs to trigger a release of separate and pathogenically valuable cardiac-, which, in turn, are directed against multiple Ags, some of which are strictly expressed in the associated epitopes into the bloodstream. A subset of patients with AIM and of their symptom-free relatives has circulating heart-reactive autoAbs myocardium (e.g. specific for the heart), others are expressed in heart and skeletal muscle (e.g. muscle-specific). Abs of IgG class, which are shown to be cardiac and disease-specific for AIM, can be used as reliable markers of autoimmune pathogenesis for identifying patients in whom immunosuppression and/or immunomodulation therapy may be beneficial and their relatives at risk.

Along with canonical Abs, some of the families proven to occur are Abs with catalytic (proteolytic) activity (catAbs or abzymes) and thus to belong to Abs with a feature of functionality! Such Ab-proteases have been found in a series of autoimmune disorders, including multiple sclerosis, autoimmune thyroiditis, etc.

The unique clinical case is a family of Ab-proteases detectable in AIM to cleave CM. Of great interest is the evolution of Ab-associated proteolytic activity at different stages of the disease progression. The activity of Ab-proteases was first registered at the subclinical stages 4-12 months prior to the clinical illness. And the activity of the Ab-proteases revealed significant correlation with scales of autoaggression and the disability of the patients with AIM as well. Therefore, the activity of Ab-proteases and its dynamics tested would confirm a high subclinical and predictive value of the tools as applicable for monitoring protocols.

The translational potential of this knowledge is in the rational design of new diagnostic tools and targeted therapeutics based on principles of artificial biocatalysts and biodesign. Ab-proteases can be programmed and re-programmed to suit the needs of the body metabolism. Or could be designed for the development of new catalysts with no natural counter-parts.

Ab-protease engineering would offer the ability to enhance or alter their sequence-specific activity to expand the clinical utility of those new tools. Therefore, further studies on Ab-mediated CM degradation and other targeted Ab-mediated proteolysis may provide biomarkers of newer generations to diagnose, to monitor, to control and to treat and rehabilitate AIM patients at clinical stages. Or to prevent the disorder at subclinical stages in persons-

at-risks to secure the efficacy of regenerative manipulations and for assessing the disease progression and predicting disability of the AIM patients and persons-at-risks.

Biography

Sergey Suchkov was born in the City of Astrakhan, Russia, in a family of dynasty medical doctors. In 1980, graduated from Astrakhan State Medical University and was awarded with MD. In 1985, Suchkov maintained his PhD as a PhD student of the I.M. Sechenov Moscow Medical Academy and Institute of Medical Enzymology. In 2001, Suchkov maintained his Doctor Degree at the National Institute of Immunology, Russia. From 1989 through 1995, Dr Suchkov was being a Head of the Lab of Clinical Immunology, Helmholtz Eye Research Institute in Moscow. From 1995 through 2004-a Chair of the Dept for Clinical Immunology, Moscow Clinical Research Institute (MONIKI). In 1993-1996, Dr Suchkov was a Secretary-in-Chief of the Editorial Board, Biomedical Science, an international journal published jointly by the USSR Academy of Sciences and the Royal Society of Chemistry, UK. At present Dr. Sergey Suchkov, MD, PhD, serves as the Director for Center of Biodesign at the N.D. Zelinskii Institute for Organic Chemistry of the Russian Academy of Sciences in Moscow, Russia. He is also a Senior Scientific Advisor for the China Hong Kong Innovation International Business Association in Hong Kong and holds the position of R&D Director at InMedStar in Russia. In addition to his leadership roles, he is an active member of several prominent scientific and professional organizations, including the Russian Academy of Natural Sciences (Moscow, Russia), the New York Academy of Sciences (USA), the American Chemical Society (ACS, USA), the American Heart Association (AHA, USA), the European Association for Medical Education (AMEE, Dundee, UK), the European Association for Predictive, Preventive and Personalized Medicine (EPMA, Brussels, EU), the American Association for Research in Vision and Ophthalmology (ARVO), the International Society for Eye Research (ISER), and the Personalized Medicine Coalition (PMC, Washington, DC, USA).

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Severe QT prolongation and Torsades de Pointe (TdP) in panhypopituitarism: A reversible endocrine crisis

Torsades de Pointe (TdP) is a fatal arrhythmia that is a potential sequela of a prolonged QT interval. Most cases of TdP arise from medication-induced or congenital prolonged QT. This case highlights an underrecognized association between panhypopituitarism and TdP, demonstrating that severe endocrine dysfunction can masquerade as primary cardiac disease. Early recognition and hormone replacement can transform a fatal arrhythmia into a fully preventable event.

A 27-year-old female with a history of craniopharyngioma status post resection with panhypopituitarism presented with intractable vomiting despite doubling her home hydrocortisone per sick-day protocol. At an outside hospital, she was given stress-dose hydrocortisone and IV levothyroxine. After receiving ondansetron for nausea, she developed TdP. She converted to sinus bradycardia following intravenous magnesium. A dopamine infusion was initiated for bradycardia and she was transferred to the cardiac critical care unit. Lab findings demonstrated severe central hypothyroidism, TSH 0.103 mIU/L (0.4-4.2 mIU/L) and acute adrenal crisis, ACTH 2.1 pg/ml (7.2-63.3 pg/ml) causing severe electrolyte derangements, including hypokalemia, 2.4 mEq/L (3.5-5.2 mEq/L). With prior laboratory work-up including low FSH, LH, and IGF-1, the cause of TdP was ultimately panhypopituitarism. Following electrolyte repletion and hormone replacement, symptoms resolved and QTc normalized.

Cardiovascular manifestations of panhypopituitarism include TdP and bradycardia due to secondary adrenal insufficiency and central hypothyroidism. Paired with increased occurrence of electrolyte abnormalities such as hypokalemia, hypomagnesemia, and hypocalcemia, as seen in this case, there is increased risk for further prolongation of QT

interval and progression into florid TdP. While TdP is a complication in panhypopituitarism, it is not well-quantified in medical literature and may not prompt close QT and electrolyte monitoring until a patient is symptomatic, at which point there is a heightened risk of an unstable arrhythmia. The most common association between endocrine disorders and TdP is hypothyroidism which prolongs the potassium repolarization currents in cardiac myocytes. Glucocorticoid deficiency alters calcium homeostasis within the cardiac myocytes, leading to prolonged repolarization and a higher possibility of developing TdP. As discussed in the endocrine society clinical practice guidelines, prompt glucocorticoid replacement prior to levothyroxine administration is imperative in reducing risk of adrenal crisis and earlier initiation of hormone therapy increases likelihood of reversing cardiac sequelae and preventing further arrhythmias.

There are a multitude of well-studied TdP etiologies, including drug-induced or congenital long QT and electrolyte imbalance, but panhypopituitarism is not listed by the AHA. Case reports of TdP in the context of endocrinopathies without electrolyte abnormalities provide evidence that panhypopituitarism can independently cause QT prolongation and TdP. In patients with panhypopituitarism, sudden cardiac events are often the end result of an unchecked endocrine crisis. Panhypopituitarism causing profound bradycardia, electrolyte disturbances, and altered repolarization sets the stage for QT prolongation long before TdP occurs. Despite the rarity of presentation, it is crucial that patients at risk for panhypopituitarism such as those with neurological tumors, pituitary apoplexy, autoimmune hypophysitis, and traumatic brain injury have regular electrolyte and QT monitoring with prompt steroid and thyroid hormone replacement to prevent life-threatening TdP.

Biography

Shahe Tchillingirian MD, is an Internal Medicine resident at the Icahn School of Medicine at Mount Sinai, training at Mount Sinai Morningside and Mount Sinai West. He earned his medical degree from Drexel University College of Medicine, where he developed a strong interest in cardiovascular disease and patient-centered internal medicine. Shahe has academic interests that include a broad range of cardiovascular conditions, with particular interest in complex cardiac pathology and inpatient cardiovascular care. He is actively involved in clinical research and quality improvement initiatives focused on improving diagnostic accuracy and clinical outcomes. He plans to pursue fellowship training in cardiology.

Dr. T. Rajini Samuel M.D

Professor of Biochemistry, Shri Sathya Sai Medical College and Research institute, SBV Chennai Campus, Sri Balaji Vidyapeeth, Deemed to be University, Chengalpattu District-603108, Tamil Nadu, India

Implementation of vector based approach using cardiac vector theory in mobile ECG application to improve ECG competence for junior medical professionals

Introduction: Mobile ECG applications detect the heart's electrical signals from the skin surface using the electrodes and sensors. The signals are amplified and then filtered to remove artifacts. The software identifies the various components of the ECG waves, analyze them and display the usual metrics. This can be transmitted to a healthcare professional through wireless transmission which helps in decreasing the time delay in detection of abnormal ECG findings and the earlier management of coronary artery diseases especially the myocardial infarction.

ECG is one of the most important, cost-effective, safest, non-invasive cardiac diagnostic tests done in hospital settings which requires only few minutes to complete the test and get the results yet its interpretation remains a challenging and arduous task for junior medical staffs that often requires expert opinion. Before a century Einthoven used vectors to represent the cardiac electrical activity. The complete detailed description of the Cardiac vector theory and its clinical utility for ECG interpretation was proposed and explained in detail by Rajini Samuel (current author) in the previous research articles.

Aim: To implement the vector based approach using cardiac vector theory in mobile ECG application to improve ECG competence for junior medical professionals.

Materials and Methods: The proposed cardiac vector theory was derived using the mathematical concepts of dot product of two vectors. The projection of heart vector onto the lead vector is applied. Using their relationship the cardiac vector angle and magnitude can be easily understood and calculated. Each cardiac wave (P, QRS, T, ST Segment) represented in the form of circles can be constructed utilizing MATLAB software by the already existing equations that interrelates the bipolar and unipolar limb lead voltage recordings.

Results: Cardiac vector magnitude and angle (axis) determination was clearly depicted in each of the four quadrant using graphical vector representation citied with various abnormal ECGs. The cardiac axis calculation remains an arduous and challenging task. Therefore this detailed vector based approach will serve as an important guide to the medical students to easily observe, understand and comprehend the changes in the magnitude and direction of the cardiac vector in various common clinical conditions like ischemia, injury, infarction, hypertrophy, enlargement, bundle branch block etc.

Conclusion: The cardiac vector theory forms the basic foundation for the initial teaching of ECG tracings and guide us to analyze, correlate and comprehend the observed changes in ECG waves in various leads in different cardiac conditions. The implementation of vector based approach in Mobile ECG Application by graphical cardiac vector representation using the cardiac vector theory may help in improving the ECG competence among the junior medical professionals thereby reducing the time lag between the detection and management of cardiac emergencies. This may serve as a supporting diagnostic tool for ECG interpretation for earlier screening and quicker referral to a speciality center for further management.

Keywords: Mobile Application, Supporting Diagnostic Tool, ECG Interpretation, Cardiac Vector Theory.

Biography

Dr. T. Rajini Samuel did MBBS (2004-2010) in Chengalpattu Government Medical College. He started doing research in Electrocardiogram (ECG) interpretation during his undergraduate studies. Dr. Samuel worked for two years as a duty doctor in Venkateshwara Hospitals, Nandanam, Chennai to complete the ECG project. He had proposed the cardiac vector theory, developed Novel ECG interpretation using Vector Based approach and published 7 research articles related to his novel Cardiac Vector theory that helps in the understanding and interpretation of ECG report. Coronary heart disease remains the number one killer disease of the world. The proposed cardiac vector theory has immense clinical value in the teaching and interpretation of abnormal ECG findings. Dr. Samuel currently he is involved in the process of implementing of his novel ECG research findings collaborating with Mobile ECG device manufactures. He did his post-graduation in Biochemistry and completed M.D in Biochemistry (2012-2015) in Sree Balaji Medical College and Hospitals, Chennai. After completing his post-graduation, he joined as an Assistant Professor of Biochemistry in May 2015 in Shri Sathya Sai Medical College and Research Institute, SBV Chennai Campus. He was promoted as an Associate Professor on 1st September 2020 and Professor of Biochemistry on 15th November 2023 in the same institute. Dr. Samuel started his research on Arterial Blood Gas (ABG) interpretation during his post-graduation. He had proposed a novel pH based ABG interpretation method and also developed a novel four quadrant graphical tool for ABG interpretation. He had published 23 research articles, 3 books and one book chapter related to Arterial Blood Gas (ABG) interpretation. During COVID times, he concentrated his research on ventilator. Dr. T. Rajini Samuel had derived novel equations of motion for mechanical ventilation and published 4 research articles on Ventilator Graphics Interpretation. He had developed a Mobile Application for ABG Interpretation using the innovative interpretation and graphical methods developed by him integrating it with already

existing ABG interpretation methods. The name of the Mobile App is ccareabg. Currently he is involved in the process of testing of his ccareabg Mobile APP with many hospitals for its successful launch. He received Atmanirbhar Bharath Award 2022 and Indian Achievers Award 2021 for excellence in innovation awarded by Indian Achievers Forum, High Flyers Global Achievers Award 2022-The best Medical Science Researcher, "International Best Researcher Award" by high society ISSN International Research Awards Congress (IIRAC 2024) and International Best Scientist award awarded by Honourable Education Minister of Tamil Nadu at the conference Scopus Index Conclave 2025.

Trevor Tucker PhD

President, Dynamic Vascular Resolution Inc., Canada

Doppler ultrasound measurement of central artery stiffness and elasticity in cardiovascular disease

Introduction: Central artery elasticity is a measure of the artery's response to the impulse of blood expelled from the left ventricle. The Doppler ultrasound measurement of central artery flow velocity, and its variation over a cardiac cycle, provides a measure of the artery's response and the elasticity of the artery.

Method: The application of the physics of fluid dynamics to blood flow velocity offers a new measure of arterial elasticity, that of vascular natural frequency, which has a direct relationship with arterial stiffness. The flow velocities at specific points on a Doppler ultrasound flow velocity waveform provide vascular natural frequency at the specific arterial measurement location.

Results: The elasticity determined from the Doppler ultrasound measurement of vascular natural frequency is shown to match the stiffness reported for the same arteries using the established Pulse Wave Velocity (PWV) approach, providing initial validation of this new sonographic elasticity measurement technique.

Conclusion: This new arterial elasticity measurement technique, ultrasound measurement of vascular natural frequency, offers advantages over the established pulse wave velocity measurement technique as follows:

a. Measuring elasticity of deeply set central arteries;

b. Measuring elasticity at specific arterial locations, and;

c. Offers the potential of measuring central artery elasticity in clinical settings.

Biography

Dr. Tucker serves as president of Dynamic Vascular Resolution Inc. (DVRI), an organization focused on the physics and engineering principles that underly arterial stiffness and its role in cardiovascular disease. By applying engineering- driven transmission line models to pulsatile arterial blood flow, DVRI predicts locations where pulse flow reversals, disturbed hemodynamics, and sclerotic plaque formation are most likely to occur. Such locations are measurable using pulse Doppler ultrasound. Patterns emerge at specific arterial sites and, over time, contribute to major cardiovascular conditions, including stroke myocardial infarction and other cardiovascular diseases.

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Current approaches to anti-angina drug treatment in Chronic-Stable Angina Pectoris (CSAP) in US primary care and cardiology – A cross-sectional, blinded standard-of-care survey

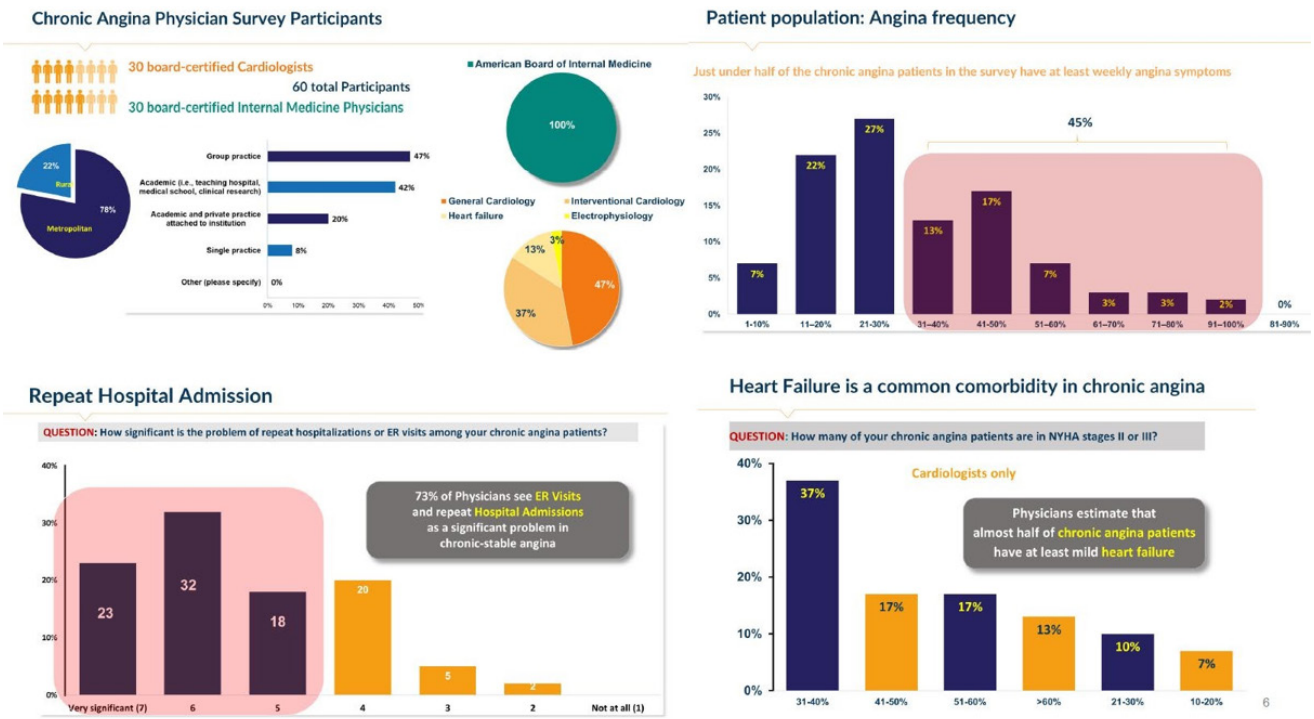
Background: Availability and use recommendations of anti-anginals in Chronic-Stable Angina Pectoris (CSAP) has changed little since the last anti-anginal was FDA approved in 2006. Recent large outcomes studies have changed consensus on management of CSAP. Guidelines again focus on drug treatment for most pts. With new anti-anginals in development it seems prudent to investigate management approaches to CSAP in primary care and cardiology.

Methods: Perceived disease burden, similarities & differences in treatment with available anti- angina drug portfolio and impact of select comorbid conditions was studied comparing 30 cardiology (CARD) vs 30 Internal Medicine (IM) participants (demographics: Fig.1). Eligible participants were board-certified, actively managing CSAP patients (caseload ≥30 and ≥25 pts.). The survey comprised 30 questions assessing demographics, patient characteristics, diagnostic approaches, and treatment initiation & maintenance patterns. Responses were anonymized and collected between Jul and Aug 2025. Evaluable information was available for all 60 physicians.

Results: Baseline patient demographic data confirms representative patient pool: 56% male, estimated age 60-70y for most (65%), and weekly angina symptoms in 45% of pts. For key survey output data see Fig. 1.

Conclusion: There is agreement between CARDs and IMs on treatment goals, utility of antianginals, assessment and core drivers of refractory angina, impact of CMD as a comorbidity and its treatment- complicating effect. Treatment initiation with 2 antianginals is common despite UIS guideline recommendations to the contrary. Differences exist between antianginal drug choices and comorbidity prevalence estimates.

Figure 1.



Biography

Dr. Tigör trained both in Germany and the US and earned his medical degree from Charité School of Medicine of Humboldt University, in Berlin, Germany. He spent several years in cardiovascular research including a research fellowship at Mount Sinai Hospital in New York. In 2019, Dr. Tigör co-founded Auxilius Pharma, a Warsaw based biotech startup focusing on developing new, innovative treatment options for cardiovascular conditions with high unmet need such as chronic-stable angina.

Vivek Vaibhav
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Multimodal deep learning for intraoperative hemodynamic instability prediction

One significant cause of perioperative morbidity and mortality is Intraoperative Hemodynamic Instability (IHI), which includes episodes of hypotension, hypertension, and arrhythmias. Current monitoring systems mainly alert clinicians when thresholds are violated, relying heavily on clinician alertness; therefore, they are reactive in nature and do not have sufficient sensitivity to detect the range of complex, multidimensional physiological trajectories that occur before IHI. This article will present a systematic review of the emerging Multimodal Deep Learning (MDL) approaches to predicting IHI intraoperatively by using different sources of data to evaluate how heterogeneous continuous physiological waveforms (e.g., arterial blood pressure, ECG, SpO2, EEG), Electronic Health Records (EHRs), Anesthesia Information Management Systems (AIMS), and imaging modalities can be fused and analyzed through early, late, or hybrid fusion architectures. We will examine neural networks, including Convolutional Neural Networks (CNNs), Long Short-Term Memory (LSTM) networks, and transformer-based models, to determine their effectiveness for capturing both spatial and temporal signal characteristics relevant to the prediction of hemodynamics. Studies of apparent groundbreaking importance such as Hypotension Prediction Index (HPI) studies and VitalDB-based studies have shown that MDL models yield Area Under the Receiver Operating Characteristic Curve (AUROC) values between 0.91 and 0.95, along with clinically relevant lead times (5-15 minutes) before hemodynamic deterioration; resulting in significant improvements over standard statistical and univariate machine-learning baselines. Clinical studies to evaluate the efficacy of the MDL approach for clinician decision support have shown that the use of MDL-based decision support will reduce time-weighted average intraoperative hypotension by up to 50% relative to control groups in randomized controlled trials. Additionally, this review provides an overview of significant barriers (i.e., data heterogeneity, model generalizability, model bias, regulatory

compliance, and ethical use) that must be overcome for successful implementation of an AI system in high-stakes operating rooms. Future directions for MDL systems include implementation of federated learning frameworks, the development of personalized adaptive predictive systems, and the utilization of explainable AI (XAI) to promote clinician confidence and enhance the equitable and safe use of MDL systems in diverse perioperative care environments.

Biography

Vivek Vaibhav is Presently working as the Head of the Department at Saraswati Institute of medical sciences at Hapur near Delhi. Previously, he has been associated with Rama Hospital, Narinder mohan hospital & the largest hospital in Asia Safdarjung hospital. With over 40 publications and 30 Post graduates under him he is one of the Senior most faculty. At International Heart congress this is his 4th visit. Vivek has been with us at Tokyo, Paris, Rome & now here at Barcelona.

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Analysis of myocardial phase separation mechanisms driven by AI and thermodynamic laws and their clinical translation

Heart failure remains a major global cause of morbidity and mortality. A significant challenge in cardiac regeneration is the inability to generate new Cardiomyocytes (CMs) through cell division, which may be linked to ribosome biogenesis dysfunction associated with Liquid–Liquid Phase Separation (LLPS). The circadian clock gene brain and muscle ARNT-like protein 1 (Bmal1) is known to confer cardiac protection, but its potential role in regulating RhoA—a key modulator of cell division—remains unclear. We aimed to investigate whether Bmal1 promotes cardiac regeneration by orchestrating the circadian-dependent formation of a Bmal1/RhoA LLPS complex.

We developed a novel iterative approach combining Artificial Intelligence (AI) with thermodynamic laws to predict the LLPS potential of Bmal1 and RhoA. CMs-specific Bmal1 knockout (CKO) mice were generated. Using animal models, cellular assays, and molecular techniques—including RNA pull-down, Fluorescence Recovery after Photobleaching (FRAP), Chromatin Isolation by RNA Purification (CHIRP), and Ribo-Halo assays—we examined Bmal1/RhoA LLPS assembly and cardiac regeneration. We identified that Bmal1 deficiency disrupted ribosomal biogenesis by downregulating the ribosomal protein RPS10, which in turn impaired the binding of RPS10 to the 3' Untranslated Region (3'UTR) of RhoA mRNA in the cytosol.

This disruption prevented RhoA 3'UTR LLPS formation, leading to defective cell division and cardiac dysfunction. Strikingly, overexpression of the RhoA 3'UTR increased Bmal1 expression, restored ribosome biogenesis, and rescued normal CM division. These findings define a

novel Bmal1/RPS10/RhoA 3'UTR axis that coordinates LLPS and drives cardiac regeneration. Moreover, we showed that targeted delivery of Bmal1 via mesenchymal stem cell–derived Extracellular Vesicles (EVs) re-established Bmal1/RPS10/RhoA 3'UTR LLPS and reinitiated cardiac regeneration in a circadian-dependent manner.

In conclusion, the core circadian transcription factor Bmal1 regulates cardiac regenearation by driving the circadian-dependent assembly of a Bmal1/RPS10/RhoA 3'UTR LLPS complex in the cytosol. Collectively, our findings reveal a promising therapeutic strategy whereby EV-mediated modulation of clock-controlled LLPS promotes cardiac regeneration.

Biography

Yangxin Li received her B.S. from the University of Science and Technology of China and her Ph.D. from the University of Florida, USA. She worked as a Scientist at the Texas Heart Institute (USA) from 2006 to 2013 and has been a full professor at Soochow University since 2013.

Yao-Hua Song[1*], Yangxin Li[2]

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Molecular mechanisms of skeletal muscle regeneration after ischemia reperfusion injury

Skeletal muscle is a dynamic tissue endowed with exceptional plasticity and robust regenerative potential, which largely depends on Satellite Cells (SCs) residing between the muscle basement membrane and sarcolemma. The biogenesis, differentiation, and self-renewal of satellite cells are primarily governed by the transcription factor Paired Box Protein 7 (Pax7). TECRL (Trans-2,3-Enoyl-CoA Reductase Like) is an endoplasmic reticulum-resident protein predominantly expressed in cardiac and skeletal muscle. Mutations causing TECRL deficiency have been linked to cardiac arrhythmias and sudden cardiac death. Nevertheless, the biological function of TECRL in skeletal muscle regeneration remains largely unknown. In this study, we observed elevated TECRL expression following skeletal muscle Ischemia–Reperfusion (IR) injury. TECRL was primarily localized in satellite cells, with distribution in both the nucleus and cytoplasm. During satellite cell differentiation, TECRL expression gradually increased and exhibited an inverse correlation with Pax7 expression. Specific deletion of TECRL in satellite cells accelerated skeletal muscle regeneration via an EGR2-dependent mechanism. At the molecular level, TECRL modulated EGR2 expression through the ERK1/2 signaling cascade, thereby negatively regulating Pax7 transcription and skeletal muscle repair. Furthermore, TECRL depletion upregulated GCN5 (General Control Nonderepressible 5), which promoted EGR2 transcription through histone acetylation. Acetylated EGR2 subsequently bound to the Pax7 promoter and augmented Pax7 expression. Collectively, these results uncover a novel regulatory axis of TECRL–GCN5–EGR2–Pax7 in myogenic differentiation and skeletal muscle regeneration, providing new insights into the molecular control of muscle repair.

Biography

Yao-Hua Song has completed his PhD at the age of 30 years from Uppsala University. He is the director of muscle regeneration lab at Fuwai Yunnan Hospital, Chinese Academy of Medical Sciences, Affiliated Cardiovascular Hospital of Kunming Medical University. Yao-Hua Song has published more than 100 papers in reputed journals and has been serving as an editorial board member of repute.

Yasser Mohammed Hassanain Elsayed
Egyptian Ministry of Health, Egypt

Yasser's electrocardiographic palpitations wave with bilobed apical floating heart syndrome in Yasser's fibrillation - A strange innovative cardiovascular and radiological discoveries - A case report

Rationale: Atrial Fibrillation (AF) is the most common arrhythmia. It is known leading cause of ischemic cerebrovascular accidents. Yasser's fibrillation (sinusoidal AF) or mixed AF is a new cardiovascular discovery. The partial sino-atrial nodal function has an essential role in the presence of sinusoidal AF (Yasser's fibrillation) or mixed AF and its interpretation. Sinusoidal AF (Yasser's fibrillation) or mixed AF may be balanced between AF and normal sinus rhythm.

Patient concerns: A 23-year-old, single male farmer Egyptian patient was presented to the physician outpatient clinic with Yasser's fibrillation (sinusoidal AF) and chest pain. The patient was referred and admitted to the Intensive Care Unit (ICU) for AF with chest pain.

Diagnosis: Yasser's electrocardiographic wave with bilobed apical floating heart syndrome in a young with Yasser's fibrillation (sinusoidal atrial fibrillations) and a strange extremely rare associated rhythms.

Interventions: Chest X rays, electrocardiography, oxygenation, IV amiodarone, and echocardiography.

Outcomes: Dramatic response and excellent outcomes were the results.

Lessons: Bilobed apex heart with floating heart syndrome is an innovative cardiovascular and radiological discovery. The bilobed apex heart with floating heart syndrome with "Yasser's Electrocardiographic Palpitations Waves" and off-phenomenon post-amiodarone IVB injection are remarkable innovative constellations. "Yasser's Electrocardiographic Palpitations Waves" was shortly described as a superficial upright wave associated with unusual palpitations. Bilobed apex heart with floating heart has no known cause. It is mostly congenital. The senses of sudden heart stoppage, generalized fatigue, vertigo, acute confusion, generalized body relaxation, a sense of separation from the environment, and a sense of no abnormality within minutes of amiodarone IVB injection are an off-phenomenon.

Biography

Dr. Yasser Mohammed Hassanain Elsayed is a scientist, critical care physician, cardiologist, and independent researcher at the Egyptian Ministry of Health. He has (154) publicized articles with (24) Innovations. They included (3) "Yasser's sign", (7) "Yasser's phenomenon", (1) "Yasser's modification", (2) "Yasser's maneuver", (1) "Yasser's method", (1) "Yasser's test", (4) "Yasser's syndrome", (1) "Yasser's fibrillation", (1) "Yasser's Procedure", (1) Yasser's ECG palpitations wave, (1) Factitious Yasser's Infarction, and (1) "Yasser's Criterion". He was an international speaker in (37) Conferences, reviewed (324) articles, was an honorable editor for (275) Journals, (13), Conferences OCM, and was an instructor in (13) official and (128) non-official training. He has (50) COVID-19 publicized articles; He was nominated for big prizes such as Breakthrough Prize, Einstein Prize, etc. He gained (more than 184) excellence certificates.

Aniruddh Srinivasan[1], Lamis El Harake[1], Edgar D. Torres Fernandez[1], John Saleeb[1], Jacob Trueb[2], James D. Flaherty[1], Ranya Sweis[1], Sanjiv Shah[1], James D. Thomas[1], Akhil Narang[1], John A. Rogers[2], Yayun Du[3]*, and Paul C. Cremer[1]

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Multimodal wearable sensing for noninvasive diagnosis and severity assessment of Aortic Stenosis (AS)

Aortic Stenosis (AS) is a common and progressive valvular heart disease, particularly in older adults, yet diagnosis and longitudinal monitoring remain highly dependent on access to echocardiography and expert interpretation. Scalable, noninvasive tools that can identify AS and assess disease severity outside conventional imaging settings could improve screening, referral, and follow-up pathways.

This presentation will describe the Wearable Sensor to diagnose and assess Severity of Aortic Stenosis (SENSE-AS), a proof-of-concept study recently published in JACC:Advances. The system uses a soft, skin-interfaced wearable platform to acquire synchronized multimodal cardiovascular signals, including electrocardiography, seismocardiography, and phonocardiography. The study evaluated whether sensor-derived features could capture physiologic signatures of AS and correlate with echocardiographic measures of disease severity.

The primary objective was to quantify the relationship between Doppler-derived aortic valve acceleration time and wearable sensor-derived acceleration time. Secondary analyses examined additional multimodal signal features relevant to cardiac timing, mechanical vibration, and acoustic murmur characteristics. By integrating electrical, mechanical, and acoustic cardiovascular information, the platform provides a noninvasive approach for assessing valve-related hemodynamic abnormalities using wearable bioelectronics.

The results support the feasibility of wearable multimodal sensing for identifying and assessing AS severity, with potential applications in outpatient screening, longitudinal monitoring, and precision cardiovascular care. Importantly, this approach may help extend cardiovascular assessment beyond episodic imaging by enabling rapid, low-burden physiological measurements in clinical or remote environments. This work suggests a pathway toward scalable cardiovascular phenotyping, particularly for older adults and populations with limited access to specialty diagnostics. More broadly, the study illustrates how synchronized wearable bioelectronics and interpretable signal analytics may complement established clinical workflows and help advance personalized cardiology.

Biography

Dr. Yayun Du is an Assistant Professor of Electrical and Computer Engineering at Vanderbilt University, with affiliations in Computer Science, Biomedical Engineering, and Mechanical Engineering. She leads the Symbio-X Lab, where her research focuses on wearable and biointegrated electronics, multimodal physiological sensing, edge AI, and human-centered health monitoring. Her wearable bioelectronic systems have been deployed across five countries in nearly 1,000 participants, spanning cardiovascular, neurological, sleep, vocal health, rehabilitation, and neonatal intensive care applications. She was named an MIT CEE Rising Star and Humboldt Scholar.

Yu Jin Chung*, Bum Sung Kim
Konkuk University Hospital, Republic of Korea

An uncommon case of pericarditis after transcatheter aortic valve replacement: The first reported case in Korea

Although Transcatheter Aortic Valve Replacement (TAVR) has become a favorable option for severe aortic stenosis in older patients, post-procedural complications still exist. Commonly known complications include paravalvular leakage, vascular injury, stroke, and conduction abnormalities. There have also been rare reports of pericarditis from Post-Cardiac Injury Syndrome (PCIS) after TAVR. PCIS is associated with cardiac surgery or trauma, and it has been speculated that certain immune complexes deposit on the pleura and pericardium inducing inflammation. Previous reports state female sex or a history of coagulopathy as possible risk factors for development of post-TAVR PCIS, but these risk factors still need to be studied.

We report a case of an 84-year-old Asian female who developed pericarditis immediately after TAVR. The patient's chief complaint was dyspnea and chest pain that developed three days after the procedure. Lab showed an increased CRP level of 10.7mg/dL, and elevated troponin of 669pg/mL with normal CK-MB levels. Initial echocardiogram showed minimal amount of pericardial effusion, but serial echocardiographic follow-up showed a significantly increased amount of pericardial effusion (Figure 1).

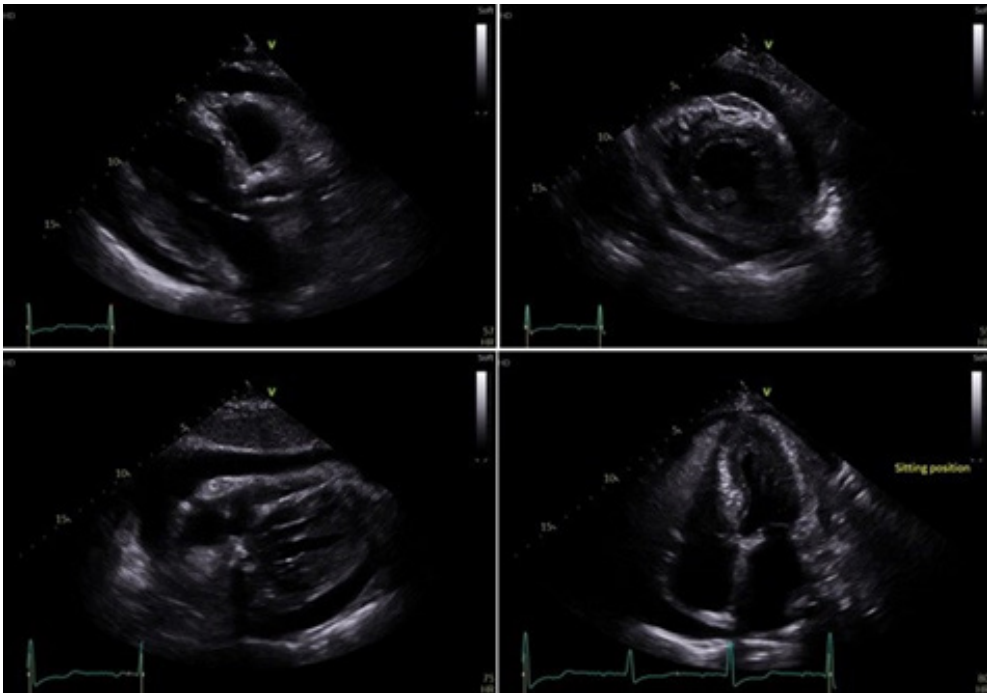

Figure 1. Echocardiogram showing moderate amount of pericardial effusion 5 days after TAVR procedure

Under the impression of pericarditis due to postcardiac injury syndrome, she was initially treated with an NSAID, ibuprofen 600mg three times a day, and colchicine 0.6mg once a day. However, due to refractory symptoms, a high dose steroid of 0.5mg/kg per day of prednisone was initiated and the patient described progressive relief of symptoms. Prednisone was slowly tapered over weeks. Five months after discharge, the patient's CRP, cardiac enzyme and NT pro BNP levels had normalized. Chest x-ray showed no pleural effusion. Echocardiogram showed resolved pericardial effusion, but remaining constrictive physiology that was to be followed up on an outpatient basis. In patients with chest pain and fever, post-TAVR PCIS should be a mandatory differential diagnosis, and detection of pericardial effusion by echocardiography may be essential in making the diagnosis.

Biography

Dr. Yu Jin Chung is a graduate of UC Berkeley. She received her medical degree at CHA University School of Medicine in South Korea. Dr. Chung completed her residency training in internal medicine and cardiology fellowship at Samsung Medical Center. She is currently a clinical assistant professor at Konkuk University Hospital. Dr. Chung specializes in echocardiography, valvular heart disease, and heart failure at the Cardiovascular Center in Konkuk University Hospital.

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Faizan Butt* MD; Priyank Chokshi MD; Marc Katz MD, FACC
Department of Cardiology, Rutgers Jersey City Medical Center, United States

Legionella pneumonia complicated by fulminant myocarditis

Background: *Legionella pneumophila* is a well-recognized cause of severe community-acquired pneumonia, particularly in patients presenting with hyponatremia and systemic inflammatory features. While pulmonary manifestations predominate, extrapulmonary involvement may occur. Cardiac complications, including myocarditis, are rare but potentially catastrophic and frequently underrecognized during the early management of Legionnaires' disease. Fulminant myocarditis associated with Legionella infection carries a high risk of malignant arrhythmias, cardiogenic shock, and death.

Case Summary: A previously healthy 52-year-old man presented with one week of fever, diarrhea, progressive dyspnea, and lethargy. On admission, he was febrile (38.5°C) and hypoxic, requiring escalation to mechanical ventilation for acute hypoxemic respiratory failure. Laboratory evaluation revealed leukocytosis (22.8×10^9/L), true hypotonic hyponatremia (serum sodium 128mmol/L), elevated inflammatory markers, and a positive Legionella urinary antigen test. High-sensitivity cardiac troponin was markedly elevated, peaking at 12,960ng/L. Electrocardiography demonstrated diffuse ST-segment depressions consistent with subendocardial injury. Transthoracic echocardiography revealed severe left ventricular systolic dysfunction with an ejection fraction of 20% and regional wall motion abnormalities. Coronary angiography excluded obstructive coronary artery disease.

Despite initiation of appropriate antimicrobial therapy and initial hemodynamic stability, the patient developed sudden ventricular fibrillation arrest on hospital day two, requiring prolonged resuscitation. Post-arrest echocardiography showed further deterioration of left ventricular function with persistent severe systolic dysfunction. He progressed to refractory cardiogenic shock necessitating escalating vasopressor support. Veno-Arterial Extracorporeal Membrane Oxygenation (VA-ECMO) was initiated for combined circulatory

and respiratory support, and an intra-aortic balloon pump was placed for left ventricular unloading. Despite maximal mechanical and pharmacologic therapy, the patient's condition continued to decline, culminating in multiorgan failure and death.

Discussion: This case illustrates the fulminant and lethal potential of Legionella-associated myocarditis. The diagnosis was supported by markedly elevated cardiac biomarkers, dynamic electrocardiographic changes, severe new-onset left ventricular dysfunction, and exclusion of ischemic disease. The pathophysiology is thought to involve direct bacterial invasion and immune-mediated myocardial injury. Although rare, cardiac involvement should be suspected in patients with severe Legionella pneumonia who demonstrate elevated troponins, arrhythmias, or hemodynamic instability. Early cardiac monitoring with serial electrocardiograms, troponins, and prompt echocardiography is essential. Rapid recognition of fulminant myocarditis may warrant early consideration of mechanical circulatory support. However, as demonstrated in this case, outcomes remain poor despite aggressive intervention, underscoring the need for heightened awareness and earlier risk stratification in this high-risk population.

Biography

Dr. Faizan Butt MD is a PGY-2 Internal Medicine Resident at Rutgers Jersey City Medical Center with focused interest in cardiovascular medicine. His clinical and academic interests include advanced heart failure, mechanical circulatory support, cardiogenic shock and complex coronary interventions. Dr. Butt is actively engaged in quality improvement and outcomes-based research initiatives aimed at optimizing guideline-directed medical therapy and improving cardiovascular risk stratification. He has led and collaborated on IRB-approved projects and multidisciplinary efforts designed to enhance inpatient and transitional cardiac care. With a strong foundation in hemodynamic assessment and devise-based therapies, he is committed to integrating evidence-based medicine with innovative clinical practice. Faizan Butt plans to pursue fellowship training in cardiovascular disease and aspires to contribute to academic cardiology through research, education and leadership focus on improving patient centered cardiovascular outcomes.

Heesun Lee[1,2*] MD, PhD; Jun-Bean Park[1,3] MD, PhD; Hyung-Kwan Kim1,[3] MD, PhD; Bongseong Kim[4] PhD; Chan Soon Park[1,3] MD, PhD; Tae-Min Rhee[1,2] MD; Soongu Kwak[1,3] MD; Kyungdo Han[4] PhD; Su-Yeon Choi[1,2] MD, PhD; Yong-Jin Kim[1,3] MD, PhD

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BMI-specific associations between Atherogenic Index of Plasma (AIP) and atherosclerotic cardiovascular disease in young adults: A nationwide cohort study

Background: The Atherogenic Index of Plasma (AIP), derived from the triglycerides/high-density lipoprotein cholesterol ratio, reflects the balance between atherogenic and protective lipoproteins. Although it has been associated with cardiovascular risk factors, such as obesity, and with Atherosclerotic Cardiovascular Disease (ASCVD), the prognostic value in young adults—particularly across the Body Mass Index (BMI) spectrum—remains poorly defined.

Methods: We analysed 6,090,721 Korean adults aged 20–39 years from the National Health Insurance Service who underwent standardized national health screening between 2009 and 2012. AIP was log-transformed and categorized into Quartiles (Q). The primary endpoint was ASCVD, defined as a composite of cardiovascular death, myocardial infarction, ischemic stroke, peripheral artery disease. Participants were followed until the occurrence of clinical event or December 31, 2023, whichever came first, after 1-year lag. Cox proportional hazards models estimated Hazard Ratios (HRs) for ASCVD according to AIP quartiles, overall and stratified by BMI.

Results: During a median follow-up of 13.6 years, 73,526 ASCVD events occurred (1.21%) in our cohort (mean age, 30.8 years; men, 59.5%; mean LDL-c levels, 104.6mg/dL). Higher AIP showed a graded association with ASCVD risk after multivariable adjustment, including LDL-c levels (adjusted HR vs. Q1:1.05 for Q2, 1.13 for Q3, 1.33 for Q4). This relationship persisted across all BMI categories, including underweight (BMI<18.5kg/m2; HR 1.47) and normal weight (18.5–22.9kg/m^2; HR 1.34), with risks comparable to obesity (≥25kg/m2, HR 1.50). Penalized spline analyses demonstrated significant non-linear associations in all BMI strata (p<0.01), with the earliest and steepest risk increase in underweight individuals. Subgroup analyses also indicated a consistent association across clinically relevant subgroups.

Conclusions: In this largest young adult cohort to date, AIP was an independent predictor of ASCVD across the BMI spectrum, even among biomarker that may refine early risk assessment and support tailored prevention strategies beyond LDL-c–based approaches.

Biography

Heesun Lee MD, PhD, is a cardiologist and professor in the Division of Cardiology at Seoul National University Hospital, Republic of Korea. Her research focuses on preventive cardiology, cardiovascular imaging, and population-based epidemiology, with particular interest in cardiometabolic risk, coronary atherosclerosis, and digital health–enabled management of cardiometabolic diseases. Heesun Lee has led multiple nationwide cohort studies using Korean National Health Insurance data and advanced imaging registries. she is actively involved in international collaborations and academic societies, aiming to improve early risk stratification and personalized prevention of atherosclerotic cardiovascular disease.

Ishan Abdullah[1*], Omar Saadi[1], Ahmed Attia[3], Mohamed Abdou[3], Mohammed Zohery[1], Abdelrhman Refaey[3], Lucas Heilbroner[1], Malik Obeidallah[1], Athanasios Naum[1], Asil Alsaad[3], Fatma Mokhtar[3], Ameer Abutaleb[3], Marco Mercader[2]

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Characterizing cardiac ECG and echocardiographic abnormalities in cirrhotic patients with and without heart failure

Background: Liver cirrhosis is associated with characteristic Electrocardiographic (ECG) and cardiac structural abnormalities, including QTc prolongation and low voltage. In those with heart disease, these changes are often encompassed under the entity of cirrhotic cardiomyopathy, a condition marked by subclinical cardiac dysfunction in the setting of chronic liver disease. However, cirrhotic cardiomyopathy may occur in the absence of overt Heart Failure (HF), and limited data exist on the additive cardiac impact of comorbid HF in patients with cirrhosis and how it manifests on ECG and echocardiogram.

Methods: We conducted a retrospective cohort study of 154 patients with cirrhosis, including 58 with clinically diagnosed HF (HFpEF: n=32; HFrEF: n=26) and 96 without HF. Electrocardiographic and echocardiographic parameters were systematically compared between groups using independent t-tests for continuous variables and chi-squared tests for categorical variables.

Results: Cirrhotic patients with HF had significantly longer QTc intervals (445.1ms vs 431.7ms, p=0.018) and were more likely to meet long QTc criteria (37.9% vs 20.2%, p=0.028). The proportion of cirrhotic patients with heart failure who met low voltage criteria in limb leads (32.8% vs 20.2%, p=0.123) and precordial leads (31.0% vs 27.7%, p=0.794) was not significantly different from those without heart failure. Atrial fibrillation was markedly more prevalent in the HF group

(53.4% vs 16.0%, p<0.001) and PR intervals were prolonged in patients with heart failure (182.1ms vs 161.0ms, p=0.0035). No significant differences were observed in the P/QRS/T axes, nor the prevalence of T-wave abnormalities and ST changes.

Left atrial enlargement was more common in the HF group (46.6% vs 28.7%, p=0.040), as was left ventricular hypertrophy (58.6% vs 30.9%, p=0.0013). Patients with HF also had lower ejection fraction (54.0% vs 61.4%, p=0.0014). Pericardial effusion (13.8% vs 3.2%, p=0.033) and pleural effusion (20.7% vs 8.3%, p=0.050) were significantly more frequent in the HF group. No significant differences were observed in the proportion of patients with ascites or peripheral edema.

Conclusion: Cirrhotic patients with concomitant HF demonstrate potentially additive electrophysiologic and structural cardiac abnormalities, including prolonged repolarization, atrial arrhythmias, AV conduction delay, and atrioventricular remodelling compared to those without HF. These results underscore the importance of enhanced cardiac monitoring in cirrhotic patients with HF, a population not well characterized in existing literature.

Biography

Ishan Abdullah is a 3rd year medical student at the George Washington University School of Medicine & Health Sciences. He is interested in pursuing a career in general cardiology and has interests in refugee healthcare and the application of artificial intelligence in medicine.

Mohammed Hashem[1*], Payam Haftbaradaran Esfahan[1], Daniel Daher[2], Anders Franco-Cereceda[3,4], Magnus Bäck[1,2]

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Impact of preoperative COVID-19 infection on myocardial injury and outcomes after aortic valve surgery in the pre-vaccination era

Background: The long-term impact of preoperative SARS-CoV-2 infection on patients undergoing Surgical Aortic Valve Replacement (SAVR) remains insufficiently defined, particularly in the pre-vaccination era. This study investigated whether previous COVID-19, determined by serology on the day of surgery, was associated with postoperative myocardial injury and long-term adverse outcomes after SAVR.

Methods: We conducted a prospective follow-up study within DAVAACA including 99 patients who underwent SAVR at Karolinska University Hospital between 1 July 2020 and 31 May 2021. Patients were classified as antibody-positive (n=15) or antibody-negative (n=84). Baseline data and outcomes were collected through structured medical-record review. The primary endpoint was a composite of major adverse cardiovascular events (myocardial infarction, stroke, or cardiovascular death) and all-cause mortality. Kaplan-Meier analysis, multivariable Cox regression, and logistic regression were performed. Postoperative Creatine Kinase Myocardial Band (CK-MB) within 24 hours was evaluated in relation to infection status, Extracorporeal Circulation (ECC) time, and Aortic Cross-Clamp (AXC) time.

Results: During a median follow-up of 3.4 years, the primary endpoint occurred in 2 of 15 antibody-positive patients (13.3%) and 4 of 84 antibody-negative patients (4.7%). The difference was not statistically significant in Kaplan-Meier analysis (log-rank p=0.51). Adjusted estimates

were numerically higher among antibody-positive patients but remained non-significant (hazard ratio 6.6, 95% confidence interval 0.3-109.4, p=0.10; odds ratio 6.6, 95% confidence interval 0.7-65.4, p=0.30). Age independently predicted the primary endpoint (hazard ratio 1.1 per year, 95% confidence interval 1.0-1.4, p=0.03). Postoperative CK-MB did not differ significantly by antibody status, but was strongly associated with ECC time (β=0.003/min, 95% confidence interval 0.002-0.004, p<0.0001) and AXC time (β=0.004/min, 95% confidence interval 0.003-0.005, p<0.0001), without significant interaction by prior infection.

Conclusion: In this pre-vaccination SAVR cohort, prior SARS-CoV-2 infection was not significantly associated with long-term adverse outcomes, although higher risk estimates warrant cautious interpretation. Postoperative CK-MB appeared more closely linked to operative ischemic burden than prior infection.

Biography

Mohammed Hashem is a Swedish physician and PhD student at Karolinska Institutet, Department of Medicine, Solna, with research focused on translational cardiovascular medicine, inflammation, aortic valve disease, and outcomes after cardiac surgery. Hashem's doctoral work uses the DAVAACA cohort to study molecular and clinical consequences of inflammatory exposure in patients undergoing aortic valve replacement. Hashem has clinical experience in cardiothoracic and vascular surgery at Karolinska University Hospital and is interested in translational research that connects surgical outcomes with cardiovascular biology.

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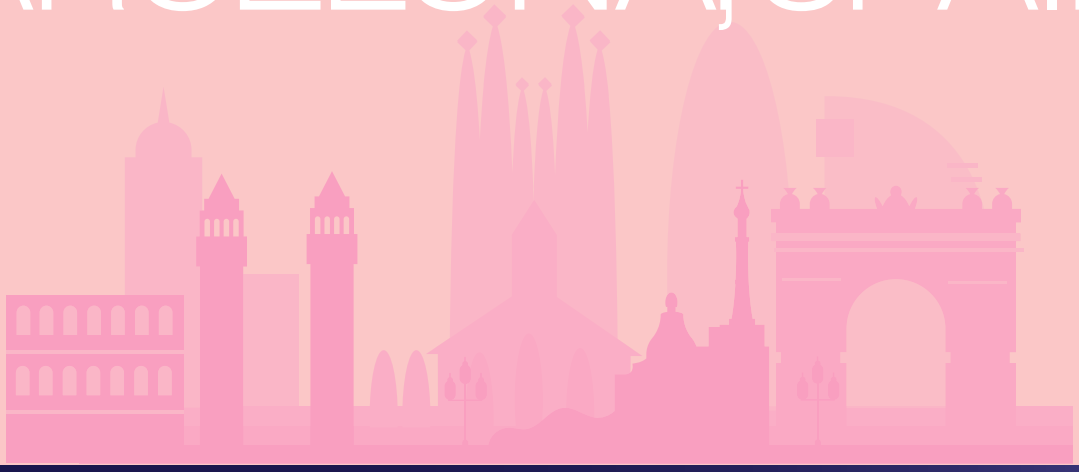

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