


## MEETING HIGHLIGHTS

# American Heart Association EPI|Lifestyle Scientific Sessions: 2020 Meeting Highlights

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The annual American Heart Association (AHA) EPI|Lifestyle Scientific Sessions took place March 3 to 6, 2020, in Phoenix, Arizona. The 2020 AHA EPI|Lifestyle Scientific Sessions were combined meetings of the Council on Epidemiology and Prevention and the Council on Lifestyle and Cardiometabolic Health. This year the conference theme was “Promoting Cardiovascular Health Across the Lifespan: How Do We Live Healthier, Longer?”<sup>1</sup> and highlighted research examining cardiovascular health across the life course. Results from both observational studies and randomized controlled trials were presented at the meeting, including research on omics, nutrition, social determinants of health, physical activity, and real-world data (Box 1). A total of 769 participants, including clinicians, public health professionals, and trainees, attended the 2020 meeting, which hosted 385 poster presentations, 78 moderated posters, and 57 oral presentations.

### CONFERENCE THEME: “PROMOTING CARDIOVASCULAR HEALTH ACROSS THE LIFESPAN: HOW DO WE LIVE HEALTHIER, LONGER?”

The opening session of the meeting featured welcoming remarks from Dr Robert Harrington, cardiologist at

Stanford University and president of the AHA, who presented updated statistics on the cardiovascular health of the US population, along with the new AHA 2030 US Goal to “Equitably Increase Healthy Life Expectancy by 2 Years by 2030.”<sup>2</sup> Dr Harrington emphasized the need to increase healthy life expectancy by reducing disparities across the United States while concentrating on 5 risk factors for atherosclerotic cardiovascular disease (ASCVD), including high body mass index (BMI), tobacco use, poor diet, hyperglycemia, and hypertension.

The session focused on health across the life span and featured Dr Matthew Gillman and Dr Rebecca Gottesman, who addressed the promotion of cardiovascular health in early life and older age, respectively. Dr Gillman, the Environmental Influences on Child Health Outcomes (ECHO) program director at the National Institutes of Health, discussed the importance of early-life exposures for cardiovascular health, including in the prenatal period. He addressed the importance of focusing on youth lifestyle habits to maintain a trajectory of ideal health through adulthood and how we need to focus on interrupting the intergenerational cycle of obesity.<sup>3</sup> Dr Gillman also presented the ECHO program, including its objectives and research areas.<sup>4</sup>

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### Box 1 Learning Objectives for the AHA EPI|Lifestyle 2020 Scientific Sessions.

Recognize opportunities to address identifiable and modifiable risk factors for ASCVD and implement the recommendations from recent guidelines on primary ASCVD prevention and tobacco use
Analyze the causes and health consequences of continuing disparities in ASCVD risk factors among certain racial/ethnic, sex, and socioeconomic groups
Describe the relationship between psychological stress and cardiovascular health and evaluate current evidence on psychological interventions to reduce ASCVD risk
Describe the impact of the built environment on the cardiovascular health of populations and identify research and preventive opportunities to improve such environments
Discuss current evidence and research needs related to primordial and primary ASCVD prevention in children and adolescents
Introduce the biological concept of healthy brain aging and assess the current research on the prevention of cognitive decline and dementia in older aged adults
Explain the concepts of big data and precision medicine and identify research opportunities and their applications to ASCVD prevention and treatment
Identify innovative areas and new skill sets for research in cardiovascular disease epidemiology for early-career scientists and the existing scientific workforce

Source: AHA EPI|Lifestyle Programming Page, Final Program.

AHA indicates American Heart Association; and ASCVD, atherosclerotic cardiovascular disease.

Dr Gottesman, associate professor of neurology at Johns Hopkins University School of Medicine, discussed the importance of a life-course approach for vascular and brain health. Among the many studies presented, Dr Gottesman specifically described how ASCVD risk factor burden in middle age predicts late-life cognitive decline and dementia<sup>5</sup>; thus, brain health promotion and prevention should begin in midlife and probably much earlier. She also discussed how early interventions for vascular health may contribute to healthier brain aging throughout adulthood.<sup>6</sup> Oral abstract presentations followed, with Dr Jennifer Deal, assistant professor of epidemiology at Johns Hopkins Bloomberg School of Public Health, presenting findings from the ARIC (Atherosclerosis Risk in Communities) study on retinal signs related to arteriolar damage and their relationship with lower white matter microvascular integrity.<sup>7</sup> Dr Zakaria Almuwaqqat, internist at Emory University, continued with findings from the Mental Stress Ischemia Prognosis Study, showing that brain areas involved in the regulation of stress response were associated with accelerated cellular aging.<sup>8</sup> Finally, Alexander Razavi, MD and PhD student at Tulane University, showed that a single-nucleotide variant genetic risk score of 2 million for low-density lipoprotein cholesterol predicted hyperlipidemia and lipid trajectory across the life span in the Bogalusa Heart Study.<sup>9</sup>

## MEMORIAL LECTURES, SPECIAL SESSIONS, AND FEATURED RESEARCH

Keynote and memorial lectures were followed by a diverse array of featured research related to each respective conference special session and topic area.

### Academia and Industry: Real-World Data Collaborations

Dr Elizabeth Selvin, associate professor of epidemiology at Johns Hopkins Bloomberg School of Public Health, and Dr Michael Grandner, assistant professor of psychiatry at University of Arizona, moderated the session on research collaborations between industry and academia. The session shed light on how these collaborations have improved medication development, adherence assessment, postapproval monitoring, and the overall use of technology in health care.

Dr Paul Muntner, associate dean of research at the University of Alabama School of Public Health, provided an overview of the academia–industry relationship and presented findings from his team’s work conducted in collaboration with industry partners. As an example given in response to concerns about potential adverse effects of PCSK9 (proprotein convertase subtilisin/kexin type 9) inhibitors on cognitive function, he presented findings showing no evidence of an association between PCSK9 loss-of-function variants and neurocognitive decline in black participants of the REGARDS (Reasons for Geographic and Racial Disparities in Stroke) study.<sup>10</sup> Similarly, Dr Muntner also discussed analyses that leveraged both Quest diagnostics cholesterol laboratory data and the MarketScan database.<sup>11</sup> Results from these analyses demonstrated that adults with a history of ASCVD who met the criteria for very high risk according to the 2018 AHA and American College of Cardiology cholesterol guidelines<sup>12</sup> had a 3-fold greater risk of ASCVD events compared with those who did not meet these criteria. Notably, only 21% of people meeting the definition of very high ASCVD risk were taking a high-intensity statin.

Dr Robert Califf of Alphabet Inc., cardiologist at Duke University School of Medicine and former US Food and Drug Administration commissioner, presented on the benefits of using digital technology to improve individual- and population-level health care. He stressed the importance of expanding digital access, particularly telemedicine and medication optimization in hard-to-reach populations, and the need to work with community health workers for these efforts. He also advocated for the gamification of digital technologies to create engaging interactions with individuals,

regulating digital research, and finding best practices for digital privacy. Dr Califf discussed the potential for real-world data to enhance the external validity of clinical trial results due to their use of authentic patient experiences and ability to integrate easily within electronic healthcare systems. These real-world clinical data and trials may thus afford a more generalizable and cost-effective approach to the traditional clinical trial. Furthermore, Dr Califf emphasized the challenges that accompany partnerships between academia and industry and discussed the importance of cultivating uniform standards and guidelines for the utilization of real-world evidence.

### **Epidemiologic Consortia: How to Maximize Impact?**

As cardiovascular epidemiology moves toward understanding health across the life span, multicohort consortia—partnerships among researchers across studies with the aim of answering common objectives—are gaining prominence. The special session “Epidemiologic Consortia: How to Maximize Impact?” featured talks from leaders of several prominent consortia and oral abstracts leveraging such data. Dr Norrina Allen, associate professor of preventive medicine at Northwestern University, gave advice and guidance on starting a consortium, citing her current and previous experience working with the Lifetime Risk Pooling Project,<sup>13</sup> Cross-Cohort Collaboration,<sup>14</sup> and the Dementia Risk Prediction Pooling Project. Key areas emphasized included choosing the right study question, identifying the right collaborators, and leveraging the best methods. Dr James Meigs, internist and associate professor of medicine at Harvard Medical School, discussed the pros and cons of consortia research and gave advice on how to navigate the potential challenges associated with such interdisciplinary research. Finally, Dr Josef Coresh, associate professor of epidemiology at Johns Hopkins Bloomberg School of Public Health and leaders of the Chronic Kidney Disease Prognosis Consortium,<sup>15</sup> gave advice on how to use consortium research to affect policy. His talk included guidance on formulating questions that are both important and answerable, using built-in translation and dissemination of clinical guidelines, and listening to regulators and policy makers to identify pertinent research needs.

Oral abstracts in this session followed with Dr Nathan Tintle, associate professor of statistics at Dordt University, who found strong evidence of inverse associations between  $\omega$ -3 fatty acid levels and mortality using the Fatty Acids and Outcomes Research Consortium.<sup>16</sup> Dr Tian Hu, research fellow at the University of Minnesota School of Public Health,

presented research from the International Childhood Cardiovascular Cohort Consortium on the childhood predictors of adult type 2 diabetes. She found that childhood BMI and glucose levels were predictive of adult diabetes mellitus at levels below those that are currently considered abnormal.<sup>17</sup> Dr Orna Reges, senior epidemiologist at Clalit Research Institute, presented findings from the Lifetime Pooling Project that demonstrated a cumulative effect of systolic blood pressure on ASCVD risk, underscoring the importance of early treatment.<sup>18</sup> Last, Dr Tanika Kelly, associate professor of epidemiology at Tulane University, presented findings that identified novel genomic signals for blood pressure and hypertension using whole-genome sequencing studies in participants from the Trans-Omics for Precision Medicine, Centers for Common Disease Genomics, UK Biobank, and Million Veterans Program.<sup>19</sup>

### **David Kritchevsky Memorial Lecture**

This lecture was established in 2007 to honor Dr David Kritchevsky, who made fundamental contributions to the understanding of the role of diet in the development of atherosclerosis.<sup>20</sup> This year's honoree was Dr Christopher Gardner, associate professor of medicine at Stanford University. Dr Gardner began his lecture by acknowledging Dr Kritchevsky's contribution to the field of nutrition research and his talents as a poet and musician who enjoyed writing amusing verses about science. In his talk entitled, “Better Nutrition Studies,” Dr Gardner discussed how nutrition studies are uniquely complex and how there is general agreement about the basics of a fundamental diet, in which more vegetables and whole foods would be included and less added sugars, refined grains, and processed foods. He discussed how we should embrace variability and the potential for a personalized diet and maximize rigor and generalizability in nutrition studies, and he stressed the importance of context when assessing comparisons in nutrition research. Dr Gardner concluded with his aspirational diet, which would consider health and nutrition, social justice, environmental sustainability, and palatability.

### **William B. Kannel, MD, Memorial Lectureship in Preventive Cardiology**

The William B. Kannel Memorial Lecture was established in 2013 in honor of Dr Kannel's contribution to the field of cardiovascular epidemiology.<sup>21</sup> This lecture was delivered by Dr Donald Lloyd-Jones, cardiologist and chair of preventive medicine at Northwestern University, who authored the highly cited publication defining the AHA's *2020 Impact Goals*, including the definition of ideal cardiovascular health known as

*Life's Simple 7*.<sup>22</sup> Dr Lloyd-Jones presented on the life-course approach, focusing on strategies to maintain cardiovascular health through middle age and the importance of lifestyle factors as key components of primordial prevention.

Following Dr Lloyd-Jones's lecture, researchers presented oral abstracts that focused on a wide array of clinical and population health research in diverse settings. Dr Wayne Rosamond, associate professor of epidemiology at the University of North Carolina Gillings School of Public Health, presented findings regarding the feasibility of using automated external defibrillators carried by autonomous drones to deal efficiently with out-of-hospital cardiac arrests.<sup>23</sup> Dr Ahmed Hassoon, research associate at Johns Hopkins Bloomberg School of Public Health, showed that voice-assisted artificial intelligence coaching could be a practical way to increase physical activity in sedentary cancer survivors.<sup>24</sup> Dr Jiang He, chair of epidemiology at Tulane University, presented his research on the role of sodium sensitivity and sodium resistance in hypertension, showing that individuals with either high sodium sensitivity or sodium resistance are at an increased risk of developing hypertension.<sup>25</sup> Next, Dr Rhonda Cooper-Dehoff, associate professor of translational research at the University of Florida, presented early findings from a national blood pressure surveillance system and emphasized that targeted surveillance could provide major opportunities for improving blood pressure control in the real world.<sup>26</sup> Finally, Dr Douglas Levy, assistant professor of medicine at Harvard Medical School, discussed the social disparities of vulnerable populations in the setting of tobacco cessation and provided several strategies for closing this gap, such as delivering culturally tailored care for minority groups.<sup>27</sup>

### **American Society of Preventive Cardiology Annual Debate**

The annual American Society of Preventive Cardiology debate was focused on "The Polypill in the US: Is it Time to Promote Pragmatism Over Personalization?" Dr Thomas Wang, cardiologist and chair of internal medicine at the University of Texas (UT) Southwestern Medical Center, argued for the promotion of the polypill, whereas Dr Ann Marie Navar, cardiologist and associate professor of medicine at Duke University School of Medicine, took the side of personalization. This session was moderated by Dr Pamela Lutsey, associate professor of epidemiology and community health at the University of Minnesota School of Public Health, and Dr Amit Khera, cardiologist and director of preventive cardiology at UT Southwestern Medical Center. A "polypill" refers to a fixed-dose combination pill, which,

in the setting of cardiovascular prevention, commonly includes a statin and 2 low-dose antihypertensive agents. With 2 large trials this past year focused on the polypill in resource-limited settings,<sup>28,29</sup> there has been renewed interest in broader implementation of this approach. Dr Wang began the debate by highlighting the "illusion of 'precision'" in ASCVD risk prediction and presented the polypill as a population-based approach to risk reduction. By combining multiple therapies at lower doses, he argued that the polypill may reduce the risk of side effects and improve medication adherence. Dr Navar responded that personalized medicine is "already the standard of care" in cardiovascular guidelines<sup>30</sup> and cautioned against the potential 2-tier health system that may result from using a polypill approach in resource-limited settings and an individualized approach in other settings. Instead, she advocated for the need to "remove the system-level barriers to care" and stated that "there is no single polypill that can replace care for patients." Drs Wang and Navar, along with moderators Drs Lustey and Khera, ultimately found common ground, agreeing that polypill therapies may be advantageous in terms of compliance but that different polypill formulations are needed to address specific patient needs and responsiveness to treatment. This middle ground included an approach that combined concepts of both the polypill and precision medicine.

### **Richard D. Remington Methodology Lecture and Research Methodology**

The Richard D Remington Methodology Lecture, "The Exposome: Challenges and Opportunities," was delivered by Dr Paul Elliott, chair of epidemiology at Imperial College London. Dr Elliott outlined a systems approach to integrating data from the molecular to the population level. The exposome was defined as the totality of environmental exposures from conception onward and encompasses both the internal exposome (eg, genomics, epigenetics) and the external exposome (eg, microbiome, stress, pollution).<sup>31</sup> Research into metabolomic biomarkers of exposure, for example, can help identify and further clarify causal pathways and mechanisms for the role of environmental exposures in human disease.

Oral abstracts in this session used a wide range of methodological approaches. Dr Kara Whitaker, assistant professor of health and human physiology at the University of Iowa, discussed the use of isotemporal substitution analysis while assessing the association between physical activity and cognitive function in the CARDIA (Coronary Artery Risk Development in Young Adults) study.<sup>32</sup> Isotemporal substitution analysis is a methodological approach to assess the time-substitution effects when one form of physical activity

is replaced for another.<sup>33</sup> Estimates from an isothermal substitution analysis showed that replacing sedentary behavior or low-intensity physical activity with moderate to vigorous physical activity was associated with higher cognitive performance in men, but not women, over 10 years.<sup>32</sup>

Two researchers presented abstracts that used a mediation analysis framework. First, Dr Karine Suissa, research fellow at Brigham and Women's Hospital, compared conventional and causal mediation approaches to assess whether adiposity mediates the effect of dietary glycemic load on lipid profiles in children.<sup>34</sup> Her study concluded that adiposity contributes to the associations between glycemic and blood lipids, although results varied according to the statistical method used. Also leveraging a causal mediation analysis approach, Dr Nicole Brunton, research fellow at the University of Manitoba, presented, "The Effect of Maternal Weight on Offspring Blood Pressure at 18 Years of Age: A Causal Natural-Effects Mediation Analysis."<sup>35</sup> Study results showed that offspring BMI mediates ≈46% of the effect of maternal BMI on offspring blood pressure.

The session continued with abstracts emphasizing research methodology in the development of risk-prediction models. Dr Paul Ndunda, internist and assistant professor of medicine at the University of Kansas Medical Center, presented on the development and validation of a new risk prediction score for stroke within 1 year after transcatheter aortic valve replacement.<sup>36</sup> Dr Sridharan Raghavan, internist and assistant professor of medicine at Rocky Mountain Veterans Affairs Medical Center, introduced a new hypoglycemia prediction model for individuals with type 2 diabetes mellitus, using electronic health record data.<sup>37</sup> Both presentations emphasized the importance of careful covariable selection in the development of risk predictions models.

## DIABETES MELLITUS AND CARDIOMETABOLIC HEALTH

Several presentations focused on the role of type 2 diabetes mellitus in cardiometabolic and cardiovascular health. Dr Ambarish Pandey, cardiologist and assistant professor of medicine at UT Southwestern Medical Center, presented on the association of baseline and longitudinal changes in fitness with risk of heart failure in individuals with type 2 diabetes mellitus in an ancillary study from the Look Ahead Trial.<sup>38</sup> This study showed an inverse association between baseline fitness level and heart failure risk, independent of traditional risk factors. In addition, a greater decline in fitness over time and an increase in BMI were associated with a higher risk of heart failure.

Dr Jiang He presented findings from the Diabetes Complication Control in Community Clinics Cluster Trial on the effectiveness of implementation strategies for ASCVD risk factor control among nearly 11 000 patients with uncontrolled diabetes mellitus.<sup>39</sup> The implementation of a team-based care model at community health centers in Xiamen, China, resulted in a significant reduction of ASCVD risk factors after an 18-month period, and a further reduction was observed with the addition of a clinical decision-support system to the team-based care model.

Using data from the Hispanic Community Health Survey/Study of Latinos, Dr Daniel Wang, research fellow at Harvard T.H. Chan School of Public Health, examined whether gut microbiota modify the protective effect of a Mediterranean dietary pattern against type 2 diabetes mellitus.<sup>40</sup> An association was found between the Mediterranean diet and phylogenetically diverse gut microbes, as well as many diet-related bacterial functions. Gut microbiota significantly modified the inverse association between a Mediterranean dietary pattern and type 2 diabetes mellitus.

Dr Duygu Islek, research fellow at Emory University Rollins School of Public Health, estimated the cost-effectiveness of a stepwise diabetes mellitus prevention approach in the Diabetes Community Lifestyle Improvement Program Study in Chennai, India.<sup>41</sup> Overall, a stepwise approach was found to likely be cost-effective over a 3-year period, even if screening costs were added. In the long term, the intervention was projected to save more healthcare dollars as incidence of diabetes mellitus increased.

## DISPARITIES AND SOCIAL DETERMINANTS OF CARDIOMETABOLIC HEALTH

This year's conference hosted a main session on health disparities and social determinants of health. Dr Sherry-Ann Brown, cardiologist and assistant professor of medicine at the Mayo Clinic, and Dr Mahasin Mujahid, associate professor of epidemiology at the University of California Berkeley, moderated the session with 2 additional panelists, Dr Tiffany Powell-Wiley, assistant clinical investigator at the National, Heart, Lung, and Blood Institute (NHLBI), and Dr Lenny Lopez, internist and associate professor of medicine at the University of California San Francisco. The overarching goal of the session was to consider the abstract presentations in the context of delving deeper into potential etiologies, mediators, and solutions for health disparities and social determinants of health.

The first abstract presentation was by Dr Joseph Salami, cardiologist at Baptist Health South Florida,

whose study results revealed racial and sex disparities in the secondary prevention of ASCVD.<sup>42</sup> Among statin-eligible individuals aged 40 to 75 years with clinical ASCVD, statin use was significantly lower among black Americans and women, compared with white Americans and men, respectively. The second abstract was presented by Meghan Angley, PhD student in epidemiology at Emory University Rollins School of Public Health, who illustrated that among individuals with systemic lupus erythematosus, black Americans had higher and earlier rates of ASCVD complications and recurrent hospitalizations compared with white Americans.<sup>43</sup> The third and fourth abstract presentations were delivered by Dr Jewel Scott, research fellow at Duke University School of Nursing, and Dr Nilay S. Shah, postdoctoral fellow at Northwestern University, who discussed the impact of social networks on cardiovascular health in black and South Asian populations, respectively. Stress and depression were not found to be mediators of the impact of social networks on cardiovascular health. A larger social network was associated with a greater likelihood of ideal cardiovascular health<sup>44</sup> and a lower likelihood of coronary artery calcification.<sup>45</sup>

Dr Billy Caceres, assistant professor of nursing at Columbia University, examined the association of perceived neighborhood social cohesion with ASCVD risk factors in sexual-minority adults and their heterosexual peers using data from the National Health Interview Survey.<sup>46</sup> Among sexual minorities, especially in women, greater neighborhood social cohesion was associated with a more advantageous ASCVD risk factor profile. For example, neighborhood social cohesion was associated with lower odds of physical inactivity among bisexual women.

Dr Diana Baptiste, assistant professor of nursing at Johns Hopkins University, presented research underscoring the importance of recognition and assessment of heterogeneity within the black population in America.<sup>47</sup> Her work demonstrated that the black population in America is composed of multiple subgroups and subcultures, including black Americans, African immigrants, and Afro-Caribbean people. In particular, her findings showed differences in the prevalence of ASCVD risk factors among subgroups in the black population and between black and white participants. Dr Tanjala Purnell, assistant professor of epidemiology at Johns Hopkins Bloomberg School of Public Health, completed the abstract-presentation portion with results from a community-based intervention involving 6 weekly 1-hour-long educational sessions on cardiovascular health.<sup>48</sup> Compared with a standard-of-care control, the intervention resulted in an average 5-mm Hg reduction in systolic blood pressure, higher fruit and

vegetable consumption, and increased physical activity among black individuals.

## OMICS, NOVEL EXPOSURES, AND CARDIOVASCULAR OUTCOMES

These conference sessions included research involving omics and novel biological and social exposures on ASCVD outcomes. Dr Guochong Chen, research fellow at Harvard T.H. Chan School of Public Health, presented on serum metabolomic profiles underlying the alternative Mediterranean diet, healthy eating index, and a plant-based eating index and their association with incident cardiometabolic disease.<sup>49</sup> The antioxidant metabolite module was independently associated with all 3 dietary patterns and significantly conferred a 20% and 15% lower risk of type 2 diabetes mellitus and hypertension, respectively. Dr Chuck Eaton, family physician and director of primary care and prevention at Alpert Medical School of Brown University, assessed the association between clonal hematopoiesis of indeterminate potential, or CHIP, and heart failure among postmenopausal women.<sup>50</sup> Women with Tet methylcytosine dioxygenase 2-mediated CHIP had an increased risk of heart failure with preserved ejection fraction but not heart failure with reduced ejection fraction. Dr Jonathan Unkart, physician and assistant professor of medicine at University of California San Diego, examined the relationship of abdominal muscle density and area with coronary heart disease (CHD) events.<sup>51</sup> Sex modified the association between skeletal muscle composition and CHD events. Among men, skeletal muscle density and size conferred protective and deleterious effects, respectively, on CHD events, whereas no appreciable associations were observed in women.

Leveraging the REGARDS cohort, Dr Jordan King, assistant professor of population health sciences at the University of Utah School of Medicine, assessed the cumulative effect of social vulnerabilities on incident hypertension.<sup>52</sup> A higher number of social vulnerabilities, across education, economic, and health care, associated with an increased risk of hypertension in both white and black Americans. However, black Americans were more likely to have incident hypertension compared with their white counterparts regardless of the number of social vulnerabilities. Dr Andreea Rawlings, biostatistician at Kaiser Permanente Portland, examined the relationship of cardiac biomarkers, including high-sensitivity TnT (troponin T), NT-proBNP (N-terminal prohormone of brain natriuretic peptide), and galectin-3, with cerebrovascular signs on brain magnetic resonance imaging.<sup>53</sup> Each 1-SD increase in high-sensitivity TnT, NT-proBNP, and galectin-3 was associated with at

least 30% higher odds of lobar microhemorrhages. Dr Yoshihiro Tanaka, research fellow at Northwestern University, presented on the trends in atrial fibrillation-related ASCVD mortality rates using the Centers for Disease Control and Prevention Wide-Ranging Online Data for Epidemiologic Research (CDC WONDER) database.<sup>54</sup> Age-adjusted atrial fibrillation-related mortality increased by 3.5% between 2009 to 2017, universally across race and sex subgroups.

Dr Bing Yu, associate professor of epidemiology at UT Health Sciences Center, and Dr Tanika Kelly moderated the “Hot Topics in Omics Research” session featuring the 6 presentations listed in Box 2.<sup>55–60</sup>

## HOT OFF THE PRESS

The “Hot off the Press” session featured recent publications in *Annals of Internal Medicine*, *Nature Medicine*, *JAMA Internal Medicine*, *JAMA Cardiology*, and *Diabetes Care*.

Dr Molly Conroy, chair of internal medicine at the University of Utah School of Medicine, began the session presenting results from a randomized controlled trial that evaluated the effects of electronic health record-based coaching on weight loss maintenance.<sup>61</sup> This trial randomized 194 overweight adult outpatients who had intentional weight loss of at least 5% in the past 2 years to either electronic health record tools (tracking group) or electronic health record tools plus coaching that included personalized coaching and scheduled contacts (coaching group). Over the course of 24 months, participants in the coaching group regained less weight and were more likely to have maintained weight loss of at least 5% compared with the tracking group.

Dr Scott Damrauer, assistant professor of surgery at the University of Pennsylvania Perelman School of Medicine, presented a 2-phased genome-wide association study of peripheral artery disease (PAD) in the Million Veteran Program.<sup>62</sup> For the discovery phase, the authors tested 32 million DNA sequence variants with PAD (31 307 cases and 211 753 controls) across veterans of European, African, and Hispanic ancestry. In the replication phase, the authors used an independent sample of 5117 cases and 389 291 controls from the UK Biobank. Nineteen genomic loci were identified for PAD, and among these, 18 were novel. Eleven PAD risk variants showed significant associations with disease in 3 vascular beds (coronary, cerebral, peripheral), and 4 were uniquely associated with PAD.

Dr Rob Walker, research fellow at the University of Minnesota School of Public Health, presented findings on the association of short-term testosterone therapy exposure with risk of venous thromboembolism

## Box 2. Oral Presentations in the Session “Hot Topics in Omics Research”

Mohamed Elhadad	Deciphering the Plasma Proteome of Type 2 Diabetes <sup>55</sup>
Dr Yun Zhu	Novel Plasma Lipids Predict Risk of Diabetes: A Longitudinal Lipidomics Study in American Indians <sup>56</sup>
Dr Jie Hu	Sexual Dimorphism in Genetic Associations of Testosterone and Sex-Hormone Binding Globulin with Coronary Heart Disease <sup>57</sup>
Dr Arjun Sinha	Amyloidogenic V122I Transthyretin Variant Is Associated With Progression of Adverse Cardiac Mechanics in Middle-Aged African American Adults: The Coronary Artery Risk Development in Young Adults (CARDIA) Study <sup>58</sup>
Mindy Szeto	Epigenome-Wide DNA Methylation Analysis Reveals Novel Hematologic Trait Associations for African Americans in the Jackson Heart Study <sup>59</sup>
Dr Jun Li	Polygenic Risk Score for Obesity Modifies Associations of Proinflammatory Diets With Obesity, Long-Term Weight Gain, and Cardiovascular Disease Risk: The Utilization of Polygenic Prediction in Three US Prospective Cohorts <sup>60</sup>

among men with and without hypogonadism.<sup>63</sup> The authors conducted a case-crossover study in 39 622 men and followed them for 12 months. Men in the case periods (6, 3, and 1 month before the venous thromboembolism events) were matched with themselves in the control periods (equivalent periods in the 6 months before the case periods). The authors found that the use of testosterone therapy in all case periods was associated with ~2-fold higher risk of venous thromboembolism among men with and without hypogonadism.

Dr Stephen Sidney, director of research clinics at Kaiser Permanente, Northern California, evaluated the impact of the aging of the US population on CHD mortality using data from CDC WONDER.<sup>64</sup> From January 2011 to December 2017, the total number of US adults aged ≥65 years increased by 22.9%, from 41.4 million to 50.9 million. Meanwhile, the number of deaths increased by 8.5% for CHD and 38.0% for heart failure, most of which were in the group aged ≥65 years. With the number of adults aged ≥65 years projected to increase in the coming decades, new approaches are needed to prevent and treat CHD.

Olive Tang, MD and PhD student at Johns Hopkins University School of Medicine, presented findings on the short-term all-cause and ASCVD mortality risks associated with hyperglycemia in older adults.<sup>65</sup> The authors analyzed data from 5791 adults aged ≥66 years in the ARIC study. They found that long-standing diabetes mellitus (duration ≥10 years) had a substantial effect on short-term mortality, independent of other ASCVD risk factors in older adults. Those with prediabetes remained at low risk for mortality over a median 5.6 years

of follow-up. These findings suggest that duration of diabetes mellitus is an important factor to consider in identifying older adults with the highest risk of mortality.

Dr Yanjun Guo, research fellow at Harvard T.H. Chan School of Public Health, presented findings on the associations of types of low-carbohydrate and low-fat diets with mortality among US adults.<sup>66</sup> The authors used data from the 1999 to 2014 US National Health and Nutrition Examination Surveys, including 37 233 US adults aged  $\geq 20$  years with 24-hour dietary recall data. Low-carbohydrate and low-fat-diet scores were not associated with total mortality. However, a healthy low-carbohydrate diet (lower amounts of low-quality carbohydrates, higher amounts of plant protein and unsaturated fat) and a healthy low-fat diet (lower amounts of saturated fat, higher amounts of high-quality carbohydrates and plant protein) were associated with lower total mortality.

## NHLBI TRAINEE SESSION

The annual NHLBI trainee session featured both oral abstracts and moderated posters presented by trainees from 13 institutions.<sup>67–78</sup> There were numerous contributions from large National Institutes of Health–funded cohorts, including the Hispanic Community Health Study/Study of Latinos; the ARIC study; the Framingham Offspring Study; the CARDIA Study; and the Health, Aging, and Body Composition Study.

Major themes covered during the trainee session included diet, physical activity, and psychosocial risk factors across the life span. Dr Richard Pickering, research fellow at Boston University, presented data from the Framingham Offspring Study to suggest that dietary protein, from plant or animal sources, and an active lifestyle are important strategies to reduce long-term risk of type 2 diabetes mellitus.<sup>74</sup> In addition, on the topic of active lifestyles, Dr Carmen Cuthbertson, research fellow at the University of North Carolina at Chapel Hill, showed that step counts and time spent with purposeful steps ( $>40$  steps/min) were associated with a lower risk of type 2 diabetes mellitus.<sup>77</sup> In a study by Dr Shannon Donofry, research fellow at the University of Pittsburgh, depressive symptoms were seen as potential mediators of the effect of mindfulness practices on diet quality.<sup>69</sup> Overall, these early-career scientists contributed important epidemiological work that demonstrated the value of addressing risk factors across the life span.

## EARLY-CAREER EVENTS AND CONFERENCE AWARDS

### Rapid Fire Orals

This year, 4 finalists were selected to compete for the Early-Career 3-Minute Rapid Fire Oral Abstract

Competition,<sup>1</sup> featuring a 3-minute presentation and then a 7-minute question-and answer session designed to demonstrate effective academic and research communication skills (Box 3). The winner was Dr Nitin Kondamudi, cardiology fellow at UT Southwestern Medical Center. His research conducted in patients with heart failure with reduced ejection fraction showed that higher natriuretic peptide levels were associated with a greater risk of heart failure hospitalization or death, especially for nonblack individuals. Dr Jovia Nierenberg, recent PhD graduate from Tulane University, was this year's runner-up. She presented her research findings on a genetic risk score for high blood pressure among individuals with chronic kidney disease. The genetic risk score was associated with ASCVD events but not worsening kidney function. Following the competition, Dr Deepak Gupta, cardiologist and assistant professor of medicine at Vanderbilt University Medical Center, delivered a keynote speech on “Developing a Career in Academic Medicine” and highlighted a few critical factors for success, including persistence, resilience, mentorship, institutional support, and personal and professional balance.

### Connection Corners

“Connection Corners” offered presentations and networking opportunities for early-career attendees within the theme of Navigating Life During Academia. This year, 3 Connection Corners were presented. The first one, titled “Family Responsibilities,” was presented by Dr Ryan Demmer, associate professor of epidemiology at the University of Minnesota School of Public Health, and Dr Jacinthe Leclerc, research fellow at McGill University. The second, “The Tenure Process,” was presented by Dr Bertha Hidalgo, associate professor of epidemiology at the University of Alabama Birmingham School of Public Health. Finally, Dr Erin Michos, cardiologist and associate professor

#### Box 3. Early-Career 3-Minute Rapid Fire Oral Abstract Competition Presented by the Early Career Committees of the Council on Lifestyle and Cardiometabolic Health and the Council on Epidemiology and Prevention

Dr Nitin Kondamudi (winner)	Association of Race, Natriuretic Peptide Levels, and Cardiovascular Outcome in Heart Failure With Reduced Ejection Fraction
Dr Jovia L. Nierenberg (runner up)	Genetic Risk for High Blood Pressure Associates With Cardiovascular Disease but Not Worsening Kidney Disease in Patients With Kidney Disease: The Chronic Renal Insufficiency Cohort
Dr Anna Askari	Dietary Sugar in California Public High School: Are We Contributing to Lifelong Obesity?
Kathleen Andersen	The Opportunity Cost of Sticker Shock: The Real-World Use, Safety, and Effectiveness of PCSK9 Inhibitors



of medicine at Johns Hopkins University School of Medicine, discussed “Personal Wellness” in the final Connection Corner. She highlighted the need for structural and institutional change to reduce burnout in academia, and she presented tools for researchers to help boost their personal resilience, such as a healthy lifestyle, social connections, reframing, and mindfulness. Dr Michos also discussed the importance of maintaining joy in professional life and following your own internal compass to guide your academic

career, even if it leads to a different path compared with others.

## Transitions Across the Researcher Life Course

The last early-career event was an interactive session featuring a panel discussion on transitions across the researcher life course, followed by group discussions. The first panelist, Dr Laila Al-Shaar, research fellow at Harvard University, focused on the transition from

### Box 4. Council on Epidemiology and Prevention Conference Awards

Jeremiah and Rose Stamler Research Award for New Investigators	
Dr Joshua Bundy (winner)	Estimated Impact of Achieving Optimal Cardiovascular Health in the US Adult Population on Cardiovascular Disease Events <sup>79</sup>
Dr Amanda Marma Perak	Associations of Gestational Cardiovascular Health With Pregnancy Outcomes: The Hyperglycemia and Adverse Pregnancy Outcome Study <sup>80</sup>
Dr Nour Makarem	The Role of Sleep as a Cardiovascular Health Metric: Does It Improve Cardiovascular Disease Risk Prediction? Results From the Multi-Ethnic Study of Atherosclerosis <sup>81</sup>
Wendy Wang	Association of Carotid Intima–Media Thickness and Other Carotid Ultrasound Features With Incident Dementia in the Atherosclerosis Risk in Communities Neurocognitive Study (ARIC-NCS) <sup>82</sup>
Dr Zhilei Shan	Healthy Eating Patterns and Risk of Cardiovascular Disease: Results From Three Large Prospective Cohort Studies <sup>83</sup>
Sandra A. Daugherty Award for Excellence in Cardiovascular Disease or Hypertension Epidemiology	
Dr Angela Malek (winner)	Incident Heart Failure Within Five Years of Delivery Among Women With Hypertensive Disorders of Pregnancy or Pre-pregnancy Hypertension in a Diverse Population <sup>84</sup>
Dr Jennifer Stuart	Established Cardiovascular Disease Risk Factors Mediate the Relationship Between Hypertensive Disorders in First Pregnancy and Maternal Cardiovascular Disease <sup>85</sup>
Dr Paul M. Ndunda	Development and Validation of the B 2 AND 2 SV 2 ASC Score for Prediction of Stroke One Year After Transcatheter Aortic Valve Replacement <sup>86</sup>
Dr Tali Elfassy	Association of Acculturation With Six-Year Change in Systolic Blood Pressure Across Diverse Hispanic/Latino Background Groups, the Hispanic Community Health Study/Study of Latinos, 2008–2017 <sup>83</sup>
Dr Zakaria Almuwaqqat	Brain Regions Activation During Stress and Accelerated Biological Aging <sup>8</sup>
Roger R. Williams Memorial Award for Genetic Epidemiology and the Prevention and Treatment of Atherosclerosis	
Dr Tanika Kelly	Whole Genome Sequence Analysis of Blood Pressure Phenotypes in the Trans-omics for Precision Medicine and Centers for Common Disease Genomics Programs <sup>19</sup>
Trudy Bush Fellowship for ASCVD Research in Women’s Health	
Mr. Frank Qian	Healthy Lifestyle Factors and Cardiovascular Disease Risk in a Prospective Cohort of Women with a History of Gestational Diabetes Mellitus <sup>86</sup>
Dr Duke Appiah	Lactation Duration Is Associated With Lower Visceral and Pericardial Fat Volumes in Parous Women: 25-Year Follow-up in the Cardia Study <sup>87</sup>
Dr Jewel Scott	Social Networks Are Associated With Ideal Cardiovascular Health in Young Black Females: A Latent Class Analysis <sup>44</sup>
Epidemiology and Prevention Mentoring Award	
Dr Russell V. Luepker	
Early Career/Trainee Travel Award Winners	
Dr Jiun-Ruey Hu	
Dr Nilay S. Shah	
Dr Mariana Sbaraini	
Dr Qingxue Zhang	
Minority Travel Grant Winners	
Dr Liliana Aguayo	
Dr Oluremi Ajala	
Dr Yamnia Ivelisse Cortés	
Mr. Luis A. Rodríguez	
Dr Anika L. Hines	
Dr Catherina C. Martinez	

**Box 5. Council on Lifestyle and Cardiometabolic Health Conference Awards**

Award for Excellence in Research Addressing Cardiovascular Health Equity	
Dr Madison N. LeCroy	The Association of the Parent-Child Acculturation Gap With Obesity and Cardiometabolic Risk in Hispanic/Latino Youth: Results From the Hispanic Community Children's Health Study/Study of Latino Youth (SOL Youth) <sup>88</sup>
Early Investigator Travel Award	
Dr Danielle Haslam	Plasma Metabolomic Signatures of the American Heart Association Diet Score: Findings From the Boston Puerto Rican Health Study <sup>89</sup>
Dr Jie Hu	Metabolomic Response to Randomized Treatment With Estrogen and Estrogen Plus Progesterin Therapy in Postmenopausal Women <sup>90</sup>
Dr Duygu Islek	Cost-Effectiveness of the Stepwise Approach to Diabetes Prevention in India <sup>41</sup>
Dr Richard Pickering	Protein Intake Is Associated With Lower Risk of Type 2 Diabetes in the Framingham Offspring Study <sup>74</sup>
Dr Shirin Pourafshar	Urine and Plasma Metabolome of Healthy Adults Consuming the Dietary Approaches to Stop Hypertension Diet: A Pilot Study <sup>91</sup>
Mark Bieber Award	
Dr Stephen P. Juraschek	Effects of Dietary Patterns on Subclinical Cardiac Damage: Results From the DASH Trial <sup>92</sup>
Steven N. Blair Award for Excellence in Physical Activity Research	
Dr Ambarish Pandey	Association of Baseline and Longitudinal Changes in Fitness and Body Mass Index With Risk of Heart Failure in Individuals With Type 2 Diabetes Mellitus: An Analysis From the Look Ahead Trial <sup>93</sup>
Scott Grundy Fellowship for Excellence in Metabolism Research	
Dr Guochong Chen	Serum Metabolomic Signatures of Multiple Healthful Dietary Patterns and Incident Cardiometabolic Diseases in US Hispanics/Latinos <sup>49</sup>
Dr Jun Li	Interplay Between Diet and Gut Microbiota, and Circulating Levels of Trimethylamine N-Oxide: Findings From the Men's Lifestyle Validation Study <sup>93</sup>
Dr Yun Zhu	Novel Plasma Lipids Predict Risk of Diabetes: A Longitudinal Lipidomics Study in American Indians <sup>56</sup>

trainee to junior faculty. As a postdoctoral fellow, she recommended identifying the gaps in one's graduate education and establishing a clear plan for obtaining future relevant training. Entering the junior faculty role, she suggested having a clear direction for one's research and starting to write grants as early as possible. As a midcareer scientist, Dr Deepak Gupta advocated for staying on track with short- and long-term goals by identifying clear priorities at the beginning of each academic year and allocating time in a way that aligns with these priorities. Using this type of touchstone can be useful in deciding which invitations to accept and which opportunities to thoughtfully decline. Dr Mary Cushman, hematologist and associate professor of medicine at the University of Vermont Larner College of Medicine,

addressed transitions later in academic careers, opportunities for leadership in national organizations such as the AHA, and senior leadership positions on editorial boards. She also addressed decisions about administrative roles and work legacy. Ultimately, she encouraged the audience to find the joy in their work, as this is essential for maintaining a long and fulfilling career.

**Conference Awards**

Boxes 4<sup>79–87</sup> and 5<sup>88–93</sup> highlight the recipients of this year's AHA EPI|Lifestyle conference awards, according to the scientific research council.

**CONCLUSION**

The 2020 AHA EPI|Lifestyle Scientific Sessions united investigators across several disciplines and backgrounds to celebrate and showcase research involving the detection, prevention, and treatment of ASCVD. Continued efforts among the scientific and clinical community are required to further facilitate primordial ASCVD prevention and to promote ideal cardiovascular health across the life span. We look forward to next year's AHA EPI|Lifestyle Scientific Sessions, to be held in March 2021 in Chicago, Illinois.

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