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Using RVUs to Track Physician Productivity in Congenital Cardiac Catheterization: A Recipe for Failure

Sergio Bartakian, MD

Recently, a growing number of children's hospitals have started moving towards a system of tracking the relative value units (RVUs) as a means of assessing the productivity of their physicians. Although this may be somewhat accurate for general outpatient or inpatient care, it fails totally for the almost exclusively procedural specialty of congenital interventional cardiology (formerly referred to as pediatric interventional cardiology). Hospital administrators must understand this fundamental fact; your coding departments (including outsourced coding firms) and the payers, are not the experts in understanding how to code for these complex procedures. The reason is simply that they do not understand these procedures or how vastly different they are from what they are accustomed to in the non-congenital catheterization (formerly referred to as adult cardiac catheterization) world. Additionally, due to the massive volume of coding errors, there are no accurate benchmarks of RVUs for the congenital catheterization labs.

In 2015, having recognized the near complete absence of CPT® codes for congenital cardiac catheterization, we set about to create an entirely new and complete set of codes to capture the work congenital interventionalists perform. It is fair to say that prior to these new codes being created, over half of all the work performed daily was not being recognized or reimbursed. Since 2016, nearly 30 new CPT® codes have been created or revised specifically in this specialty by the Congenital Interventional Cardiology Coding Workgroup (CICCW) at the Society of Cardiovascular Angiography and Interventions (SCAI). Although this work continues, unfortunately today the problem

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of under-reporting or mis-reporting these procedures remains extensive, to say the least. In a recent discussion on this topic with Dr. Zielske from Z-Health Consulting, he confirmed the institutional error rate among their audits of children's congenital catheterization programs was 100%. And among all of the cases audited, they found at least one major error in roughly 80% of cases reviewed. In addition to all of the new codes created and released, we also wrote an entirely new section of introductory language guidelines for the congenital cardiac code set in the CPT® code book. Unfortunately, as clear and distinct as we set out to make these instructions, they are either not well understood, or simply ignored. Common sources of error are shown in **Figure 1**.

Figure 1: Common Sources of Coding Errors
• Improper / incomplete documentation by the provider
• Incorrect codes submitted by the provider
• Correct codes used by the provider, but deleted by coder prior to submission
• Correct codes used by the provider, but changed to the wrong code by coder
• Persistent use of old (deleted) codes
• Lack of knowledge of newly released codes
• Lack of applying proper and commonly used modifiers (62, 63, 80, 81, 82)
• Not resubmitting and appealing all denials
• Reliance on 3rd party coding firms rather than confirming with specialty society experts

Figure 2: Recommendations for congenital catheterization lab medical directors
• Insist your institution provide you with a new copy of the CPT® book each year
• Develop templates for reporting catheterization procedures and have a list of the CPT® codes near the top of the report for your coders to verify against
• Use the actual code descriptor (title) from the CPT® book in your reports when referencing what you did
• Insist on a report from your coding department each quarter (with 1 quarter lag time) showing the codes you reported vs what they submitted vs what was collected
• Ensure the codes you submitted match those submitted, and all denials were appealed
• Have a quarterly (at least) meeting to discuss any discrepancies, and provide ongoing education to your coders on what you do and how to use the congenital codes
• Periodically, have a formal audit performed

It is vital for providers in this specialty to understand they are the experts and to take responsibility for proper documentation and coding. For decades, pediatric trained physicians were taught nothing in the course of their medical education and training regarding how to code for their work. Shockingly, this continues throughout the healthcare industry. Much of this is because of the false belief programs have regarding their coding departments being the experts; therefore, the physician did not need to understand the system. Furthermore, as the vast majority of all congenital interventional cardiologists are salaried employees, the physician had no stake in making sure the proper codes were reported and collected. For decades, hospitals have used the excuse that the congenital catheterization lab simply did not bring in enough revenue to justify purchase of new, vital equipment or hiring of new dedicated staff or faculty, despite the fact the case load far exceeded what would be considered safe and acceptable for the existing number of staff and/or faculty employed. Previously, in the absence of having the proper CPT® codes to benefit from the hard work being performed by these individuals, this was perhaps understandable. But no longer can this excuse be acceptable. And likewise, neither can it be acceptable for institutions to force productivity measures using RVUs if they fail to understand these complex issues and continue in failing to properly report and collect for the work the providers perform.

In order to truly understand how to properly code for the many different procedures in the congenital catheterization lab, it is imperative the individual have some clinical knowledge of the work performed. This work is vastly different than that performed in the non-congenital catheterization lab. In fact, the only thing shared between the two specialties is the name of the procedure, catheterization. But the actual work performed in a catheterization for congenital vs non-congenital indications is entirely dissimilar. For this reason, when in doubt, providers and coders should rely on the specialty society staff and physicians at SCAI and the American College of Cardiology (ACC), who are the experts, to provide further explanation and guidance. To ensure programs are properly capturing and reporting the work performed, the recommendations in **Figure 2** are strongly advised.

One final point; not only is the work of providing care in the catheterization lab completely different for the congenital interventionalist as compared to the non-congenital counterpart, so is the work before and after the procedure. Every CPT® code is designed to capture three elements: pre-procedure, intra-procedure, and post-procedure care. Most administrators tend to focus on the time the physician is in the lab performing a procedure as the measure of their productivity. They fail to recognize the immense burden these procedures place on the provider in communicating with families of patients with severe congenital heart defects. The work of the pre- and post-procedure segments is another source of error in tracking RVUs. Although this work is ideally captured by the CPT® code, the system is quite rigid and not ideal for the highly variable work in this population. The existing times allotted for these segments with respect to case preparation, consent, reporting, communication of results, etc. fall very short. In fact, a congenital interventionalist performing an average of two cases, four days per week, should be considered as being similar to a busy

adult program performing a full day of coronary, structural, or peripheral interventions. The number of hours worked by the two providers are the same, though the RVUs will never reflect as such.

In time, perhaps the RVU system can be used for this purpose in this specialty. For the time being, institutions need to work with their physician expert to better understand the issues, the extent of work performed, and come up with a better means to acknowledge the great value they bring to the institution.

The work of improving this system for our providers has been long and arduous. I thank all of my co-members on the CICCW, as well as SCAI and ACC staff, for all of their hard work and efforts. I also thank all of my CPT and RUC colleagues for their understanding of the importance of helping to improve a previously ignored specialty.

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Matters of The Heart and Mind: "You're Trying to Kill My Baby"

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Those were the exact words Jenna shouted at me one afternoon on the Oxford Chidren's Hospital ICU at the cot-side of her seven-month-old daughter, Kayleigh, about twenty years ago. Seconds later, just as I was thinking about how to refute such an allegation, Jenna stormed out of the room and out of the ICU. My colleagues, attendant nurses and I were probably best described as stunned into silence. I'd better give some context… I had 'inherited' Kayleigh as my responsibility when I replaced her previous consultant (attending) who had left Oxford to a key academic appointment elsewhere.

The story reads… before I arrived in Oxford, Kayleigh had been born in Oxford with Down Syndrome and, cardiologically, an unbalanced atrioventricular septal defect (AVSD). Say canal if you like, but I do not like that description. Big right heart. Is the left heart hypoplastic or merely dwarfed by the enlarged right? Usual question / dilemma. Don't ask me the Z scores, but in good faith and with well documented opinions of valued colleagues elsewhere it was deemed she should undergo reparative surgery. Almost 6kg. Saturations in the low to mid 90%. Catheter not performed. You could be critical but let's face it, she is less than six-months-old, you are not going to write her off as having inoperably high pulmonary vascular resistance and though Z scores were on the limits, surely go for the repair? Mum had been counselled appropriately about the risks and consented, so off to the operating room Kayleigh went.

The repair was performed by a surgeon and team with a stellar reputation for AVSD repair surgery. The story was a bit of a struggle coming off bypass, hypotension requiring inotropic support, the usual. Low output, oliguria, large toe core gap, concern++. Echo had shown (surprise, surprise) mixed mitral valve stenosis and regurgitation. The next three weeks saw ongoing peritoneal dialysis, pulmonary vasodilators and as much systemic vasodilation they dared. Had they made the right decision? Wilson comes on the scene… and no, I did not make some miraculous transformation. Kayleigh remained extremely sick and the conversations around the clinicians on ICU revolved around viability, reoperation? Which operation? Palliative care? Far from saving the day, my first chats with Kayleigh's mum were pretty much focused on the negative, "We have done our best, but we are defeated by the small left pumping chamber which is now voting with its feet to tell us the heart is not viable." Jenna's body language with me carried overtones of 'She was doing OK until you appeared.' I personally did not think further reparative surgery on the mitral valve was viable. The surgeon was not keen, but to give him credit he left a door open with "If you think I can get a valve in there I am willing to have a go." I suggested catheter for haemodynamics and transoesophageal echo though my heart was not really in it. I thought it would be a statement that at least we had looked under every stone and not just given up.

Haemodynamics? Guess what? No surprises. PA pressures high of course (are you surprised?), but wedge 17-18 mmHg. LVEDP 8. PVR in 100%, oxygen 6.7. The echo team were measuring left, right, and centre, each time edging up the mitral ring diameter by 0.1-0.2mm. Kayleigh was safely back in the ICU. I return to the lab flicking through the data and the TOE loops when from behind me the surgeon breaks the silence and says, "Well?" "Not sure, Steve." It is another case of 'definitely maybe.' My colleagues Nick and Satish join in. "What have we got to lose going for an MVR?" "The baby," I quip. About ten minutes of toing and froing. Steve says, "I'll do it on Friday." I think it was Wednesday. "OK Steve, I'll go and speak to mum."

We are now back to where the story started. It seems the ICU team in the cath lab had picked up on my vibes of 'hopeless situation' and this had found its way to the cot-side as "Dr. Wilson thinks we perhaps would be better just making Kayleigh comfortable," as in opt for comfort care. Not exactly true but not far from the truth. The staff were not yet aware of the huddle that had taken place in the cath lab and the offer of a surgical valve replacement. When I appear in ICU now some 30 – 40 minutes post catheter Mum is there and thinks I am going to pile in with "Bad news we are giving up." Tearful she looks up from the cot, eyes me, and yells the "You're trying to kill my baby," line followed by her very rapid dash from the room and ICU. When the silence breaks, I explain to the team around the cot our proposal to do a mitral valve replacement. More silence. The senior anaesthetist, I can tell, thinks it is somewhere in the range, futile-to-pointless, but understands the logic of trying. I get it. The ICU attending staff feel much the same. But what does mum Jenna think? And perhaps we could get her back and have a sit down and full and frank discussion, as the line goes. Jenna is nowhere to be seen: not in the parents 'discussion room,' not in the Ronald McDonald parent accommodation, not in the secret no smoking/smoking area. The cardiac liaison nurse even goes out into the car park. Jenna's car is there but empty. I go back to my office. I'm barely in the door when my pager goes. "We've found her." "OK I'll come right down." "No don't come now, she's locked herself in the staff lavatory and won't come out."

About two hours later I get a call to say that Jenna has just returned to ICU. At the cot-side is Jenna and another woman of a similar age. It turns out she is one of Jenna's best friends and during the attempts to encourage Jenna to come out of the lavatory she had insisted that she would not come out until we called her friend Sheila. Apparently, Jenna has told Sheila: "Dr. Wilson's going to tell me they're going to switch her off."

As I approach the two women Jenna gets in the attack, "You're not switching her off, I know that's what you want to do." Sheila quickly comes in "Jenna, behave yourself, let Dr. Wilson explain." So I did explain.

Two days later Kayleigh had her mitral valve replacement. Steve and the OR and ICU teams are heroes. Steve squeezes in the smallest prosthetic valve known to man. I was wrong. Kayleigh did better than anyone could have predicted / hoped. Sure, she is on the ventilator for another two weeks, but home a couple of weeks after that. Through the medium of outpatient clinics in the presence of medical students, Jenna relaxes and comes out of her shell, she is a cabaret of parent behaviour and great fun, we are on good terms with excellent rapport.

Kayleigh has grown up, having had another MVR on the way. She is quite cheeky with her mum (I wonder where she got that from?!). Mum checks her INR at home with a 'CoaguCheck' device. She comes up to the hospital as a subject for student exams and everyone knows the story of how I was once accused of 'Trying to kill a baby' and the mother who spent two and a half hours hiding in the staff lavatory. By the way, she is not the only mother of one of my patients to have done that. But that is another story, for another time… Is it me?

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World's First Partial Heart Transplant Proves Successful in First Year

Novel Procedure Demonstrated Valve Growth & Functionality in Newly Published Study Results

DURHAM, N.C. – The world's first partial heart transplant, https://corporate.dukehealth.org/news/duke-health-performs-worlds-first-partial-heart-transplant, has achieved what researchers have spent more than a year hoping for, functioning valves and arteries that grow along with the young patient, as hypothesized by the pioneering team behind the procedure at Duke Health.

The procedure was performed in the spring of 2022, in an infant who needed heart valve replacement. The previous standard of care, using valves that were non-living, would not grow along with the child, requiring frequent replacement, entailing surgical procedures that carry a 50% mortality rate.

A study led by Duke Health physicians, appeared online January 2nd, 2024 in the Journal of the American Medical Association, found that the new manner of valve procurement used during the partial heart transplant led to two well-functioning valves and arteries that are growing in concert with the child as if they were native vessels.

"This publication is proof that this technology works, this idea works, and can be used to help other children," said Joseph W. Turek, M.D., Ph.D., first author of the study and Duke's chief of pediatric cardiac surgery, who led the landmark procedure.

The study also found the procedure requires about a quarter of the amount of immunosuppressant medication than a full heart transplant, potentially saving patients from detrimental side effects that might compound over decades.

Turek said the innovation has paved the way for a domino heart transplant, where one heart is able to save two lives, https://pediatrics.duke.edu/news/domino-heart-transplant-offers-new-opportunities-children-congenital-heart-disease. During a domino heart transplant, a patient who has healthy valves but is in need of stronger heart muscle receives a full heart transplant; their healthy valves are then donated to another patient in need, creating a domino effect.

"You could potentially double the number of hearts that are used for the benefit of children with heart disease," Turek said. "Of all the hearts that are donated, roughly half meet the criteria to go on to be used for full transplant, but we believe there's an equal number of hearts that could be used for valves."

"If you introduce the donated hearts that weren't being put to use into the supply chain and add the valves from domino heart transplants, that can create a substantial change," Turek said.

The partial heart transplant procedure has been performed 13 times at four centers around the world, including nine at Duke, several of which have been domino heart transplants.

Turek said bringing this innovation to a clinical trial would be the next step to achieving the volume in procedures that would change the availability of hearts by a large amount.

"This innovation adds a lot to the whole donation community," Turek said, "because it's treating more kids, while also honoring the wishes of selfless donor parents who've given the ultimate gift. It allows them to offer hope to another child in the process."

Preclinical data was supported by the Brett Boyer Foundation.

In addition to Turek, study authors include Lillian Kang, Douglas Overbey, Michael P. Carboni, and Taufiek K. Rajab.

ASE Publishes Two Guidelines Recognizing Advances in Pediatric and Neonatal Echocardiography

The American Society of Echocardiography (ASE) published two new guidelines offering updated recommendations on pediatric and neonatal echocardiography, replacing earlier guidelines published by the Society.

Guidelines for Performing a Comprehensive Pediatric Transthoracic Echocardiogram: Recommendations From the American Society of Echocardiography, https://www.asecho.org/guideline/guidelines-for-performing-a-comprehensive-pediatric-transthoracic-echocardiogram-recommendations-from-the-american-society-of-echocardiography/, provides a comprehensive set of pediatric transthoracic echocardiography (TTE) guidelines to replace documents originally published by ASE in 2006 and 2010. The updated guideline establishes an organizational structure and a common language that can be utilized by any practice or institution providing echocardiographic services to children with suspected, congenital, or acquired heart disease.

"In the past decade, the care of children with heart disease has evolved due to improvements in scientific knowledge and technology. Echocardiography has played a major role in this evolution, due to its increasing ability to provide more accurate information related to cardiac anatomy, hemodynamics, and function," says Leo Lopez, MD, FASE, chair of the guideline writing group. "The guideline helps organize the capabilities of echocardiography so that it can be used in a rational and logical way when caring for pediatric patients."

One of the guideline's writing group Co-Chairs, Carolyn Altman, MD, FASE, adds, "The document is designed to be an easy and convenient reference tool for busy clinicians and sonographers, and includes tables that succinctly summarize standard protocols and methods of quality improvement."

The second guideline, titled Guidelines and Recommendations for Targeted Neonatal Echocardiography and Cardiac Point-of-Care Ultrasound in the Neonatal Intensive Care Unit: An Update from the American Society of Echocardiography, provides clarification on the scope of targeted neonatal echocardiography (TNE) versus cardiac point-of-care ultrasound (cPOCUS) to ensure that practitioners use these skills in accordance with approved indications. The guideline replaces the document originally published by ASE in 2011 and has been expanded to provide recommendations for cPOCUS, including:

1. Guidance on the purpose and rationale for TNE and cPOCUS.
2. Disease and/or clinical scenario-based indications for TNE.
3. Training and competency-based evaluative requirements for TNE and cPOCUS.
4. Components of quality assurance.

Chair of the guideline writing group, Patrick McNamara, MD, FASE, says that he anticipates the updated guideline will enable more institutions to establish TNE or cPOCUS programs, generate new research, and continue to encourage collaborations between neonatologists and pediatric cardiologists.

"Close collaboration with pediatric echocardiography laboratories and the support of thought leaders in the field have resulted in the success of TNE and the establishment of neonatal hemodynamics programs. We must also acknowledge the pivotal role of Luc Mertens, MD, PhD, FASE, who chaired the original guideline writing group on this topic 13 years ago, for prompting the growth and evolution of the field of neonatal hemodynamics," he adds.

Both guideline documents are published in the February 2024 issue of the Journal of the American Society of Echocardiography. All guidelines published by ASE are available at ASEcho.org/Guidelines.

About American Society of Echocardiography

The American Society of Echocardiography (ASE) is the Society for Cardiovascular Ultrasound Professionals™. ASE is the largest global organization for cardiovascular ultrasound imaging serving physicians, sonographers, nurses, veterinarians, and scientists and as such is the leader and advocate, setting practice standards and guidelines for the field. Both the pediatric and neonatal echocardiography specialized areas are represented in ASE's Pediatric and Congenital Heart Disease Council and the Neonatal Hemodynamics TnECHO Specialty Interest Group. The Society is committed to advancing cardiovascular ultrasound to improve lives. For more information, visit the ASE website ASEcho.org or social media pages on Facebook, X, LinkedIn, or Instagram.

iRhythm Technologies Receives European Union's CE Marking Under Medical Device Regulation (EU MDR) for its Zio® monitor and ZEUS System

CE Mark Reinforces the Zio Monitor System as a Leading Innovation in Ambulatory Cardiac Monitoring and Highlights the Company's Commitment to Providing the Highest Quality Product and Services Globally

GLOBE NEWSWIRE -- iRhythm Technologies, Inc. (NASDAQ:IRTC), a leading digital health care company focused on creating trusted solutions that detect, predict, and prevent disease, announced today that its next generation long-term ambulatory cardiac monitor – the Zio monitor ECG System – has received CE mark certification under the European Union's Medical Device Regulation 2017/745 ("EU MDR") from its Notified Body, the BSI Group. The Zio monitor ECG System secured its CE mark based on compliance to EU MDR standards of performance, quality, safety, and efficacy, along with the body of clinical evidence supporting Zio in detecting potential cardiac arrhythmias.

Zio monitor builds on the high performance of Zio XT that, together with its enhanced long-term continuous cardiac monitoring service, provides an elevated end-to-end experience to patients with potential arrhythmias and demonstrates 99% patient compliance with prescribed wear times.[1] The new Zio monitor is thinner, lighter, and smaller compared to Zio XT to provide a more inconspicuous wear experience.[2-4] Early clinical and patient experience in the United States has shown that Zio monitor has even better wear times and analyzable ECG.[2] Furthermore, the certification incorporates CE mark for the ZEUS (Zio ECG Utilization Software) System, iRhythm's advanced deep-learned AI algorithm which supports the capture and analysis of ECG data recorded by Zio monitor.

"The EU MDR is arguably one of the most stringent regulatory frameworks for product approvals globally that ensures medical devices meet the rigorous standards for healthcare technologies," said Quentin Blackford, iRhythm President and Chief Executive Officer. "Receiving this CE mark certification for our Zio monitor and ZEUS system reflects our team's commitment to delivering the highest quality services as we seek to drive better health outcomes and more equitable access for patients around the globe. Our teams did an excellent job to effectively convey the significant body of clinical study evidence underlying our Zio services and our deep-learned AI algorithm[5] as key differentiators. With improved clinical accuracy compared to existing traditional Holter monitoring,[6,7] we look forward to introducing our innovative technology to many more patients in Europe."

In Europe, there remains significant unmet clinical need for improved arrhythmia detection in many countries as the prevalence of arrhythmias and stroke continues to rise.[8] With the EU MDR CE mark for the Zio monitor and ZEUS systems in hand, iRhythm plans to continue its market expansion strategy in prioritized countries across Europe where there are approximately 1.8 million ambulatory cardiac monitoring tests performed annually.

About iRhythm Technologies, Inc.

iRhythm is a leading digital health care company that creates trusted solutions that detect, predict, and prevent disease. Combining wearable biosensors and cloud-based data analytics with powerful proprietary algorithms, iRhythm distills data from millions of heartbeats into clinically actionable information. Through a relentless focus on patient care, iRhythm's vision is to deliver better data, better insights, and better health for all. To learn more about iRhythm, including its portfolio of Zio products and services, please visit **irhythmtech.com**.

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*Referenced clinical studies and data are based on U.S. subject population.

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Mount Sinai Researchers to Develop and Study AI-Powered Models That Identify Risk for Cardiovascular Disease and Treatment Response in Patients With Obstructive Sleep Apnea

Team Studying Predictive Models for Serious Sleep Condition Awarded $3 Million NIH Grant

Mount Sinai researchers are developing and studying models powered by artificial intelligence (AI) to identify the risk of cardiovascular disease events in patients with obstructive sleep apnea. The prediction models, using machine-learning techniques, will also help classify patients who may benefit from the most common treatment option for the disorder.

The researchers said their personalized tools will provide a novel approach to enhancing management of obstructive sleep apnea by optimizing the best decisions for treatment plans and improving cardiovascular outcomes. The study is supported by a four-year, $3 million grant from the National Heart, Lung, and Blood Institute of the National Institutes of Health (NIH).

Obstructive sleep apnea is a serious and chronic condition in which the upper airway becomes blocked, leading to brief pauses in breathing during sleep. It affects more than 1 billion people worldwide. The most common treatment for obstructive sleep apnea is use of a breathing device called a continuous positive airway pressure (CPAP) machine, which provides air pressure throughout the upper airway to keep it open and help with breathing while asleep. Previous studies have established the prevalence of obstructive sleep apnea and its association to cardiovascular disease. However, little research has demonstrated the benefits of continuous CPAP use on the rate of cardiovascular events.

In response to the NIH Sleep Research Plan's call for further research in critical and high-priority areas, Mount Sinai experts will use machine-learning techniques on comprehensive multi-modal datasets to identify patients at enhanced risk for atherosclerosis progression, or buildup of fats and cholesterol in the artery walls, and heightened risk for cardiovascular events such as heart attack and stroke. Researchers said the approach will also predict cardiovascular treatment effectiveness of CPAP therapy for patients with the sleep disorder who scored as "non-sleepy" on a standard clinical test, helping to identify patients who would benefit most from using CPAP as well as patients who should avoid CPAP use.

The foundation of this work is the team's recently published study which revealed the potential harm of CPAP therapy to non-sleepy patients with obstructive sleep apnea and acute coronary syndrome, such as an increased risk of stroke, heart attack, and cardiovascular death. Those findings underscored the importance of identifying apnea patients who could benefit from CPAP and steered the team towards more personalized treatment strategies, said primary Principal Investigator Neomi Shah, MD, MPH, MSc, Associate Dean for Faculty Career Advancement, Vice Chair for Faculty Affairs in the Mount Sinai Health System Department of Medicine, and Professor of Medicine (Pulmonary, Critical Care and Sleep Medicine) at the Icahn School of Medicine at Mount Sinai.

"Supported by a transformative grant, I'm thrilled to lead a project that stands at the intersection of cutting-edge artificial intelligence and sleep medicine," Dr. Shah said. "Our work will epitomize the wealth of expertise and collaborative effort across the Mount Sinai Health System to both enrich our understanding of the condition and improve patient care, impacting millions in the United States. We are committed to validating our AI tools within Mount Sinai's clinical dataset to translate our research into real-world practice, thereby, effectively bridging the research to practice gap."

The research will use data from two cohorts: the Multi-Ethnic Study of Atherosclerosis (MESA) cohort of more than 6,000 ethnically diverse, generally healthy non-sleepy participants, and the Sleep Apnea Cardiovascular Endpoints (SAVE) randomized clinical trial of more than 2,500 non-sleepy participants with moderate to severe obstructive sleep apnea and established cardiovascular disease. They will use these datasets to identify key variables that predict atherosclerosis progression and cardiovascular events such as heart attack and stroke, and to identify subgroups with differential treatment effects with CPAP for cardiovascular events based on demographics or risk characteristics, as well as validation of the models within the Mount Sinai Health System using clinical data from the electronic health record.

"We are inspired by the transformative potential of machine learning techniques in health care, particularly in analyzing vast amounts of complex data to personalize treatment strategies," said a Principal Investigator of the project, Girish Nadkarni, MD, MPH, Irene and Dr. Arthur M. Fishberg Professor of Medicine, Director of The Charles Bronfman Institute of Personalized Medicine, and System Chief of Data-Driven and Digital Medicine at Icahn Mount Sinai. "Our study has the potential to revolutionize the management of obstructive sleep apnea by offering decision support tools that optimize treatment plans, improve patient outcomes, and reduce the burden of sleep apnea-related cardiovascular disease events on both individuals and health care systems."

"Through precision medicine, we are prioritizing rigorous intervention to enhance cardiovascular disease risk reduction," said Mayte Suarez-Farinas, PhD, Associate Director of the Center for Biostatistics, Professor of Population Health Science and Policy, and Genetics and Genomic Sciences, at Icahn Mount Sinai, and a Principal Investigator of the project. "Health care providers will be equipped with innovative tools to identify patients at heightened risk for heart attack or stroke and be able to predict treatment outcomes of CPAP therapy in sleep apnea patients. This personalized approach will enable clinicians to tailor treatment strategies to individual patient needs, optimizing CPAP adherence and efficacy."

Researchers from the University of California-San Diego, Lundquist Institute for Biomedical Innovation at Harbor-UCLA Medical Center, University of Washington, and Columbia University will contribute to the study. The grant number is 1R01HL168897-01A1.

About the Icahn School of Medicine at Mount Sinai

The Icahn School of Medicine at Mount Sinai is internationally renowned for its outstanding research, educational, and clinical care programs. It is the sole academic partner for the eight- member hospitals* of the Mount Sinai Health System, one of the largest academic health systems in the United States, providing care to a large and diverse patient population.

Ranked 13th nationwide in National Institutes of Health (NIH) funding and among the 99th percentile in research dollars per investigator according to the Association of American Medical Colleges, Icahn Mount Sinai has a talented, productive, and successful faculty. More than 3,000 full-time scientists, educators, and clinicians work within and across 44 academic departments and 36 multidisciplinary institutes, a structure that facilitates tremendous collaboration and synergy. Our emphasis on translational research and therapeutics is evident in such diverse areas as genomics/big data, virology, neuroscience, cardiology, geriatrics, as well as gastrointestinal and liver diseases.

Icahn Mount Sinai offers highly competitive MD, PhD, and Master's degree programs, with current enrollment of approximately 1,300 students. It has the largest graduate medical education program in the country, with more than 2,000 clinical residents and fellows training throughout the Health System. In addition, more than 550 postdoctoral research fellows are in training within the Health System.

A culture of innovation and discovery permeates every Icahn Mount Sinai program. Mount Sinai's technology transfer office, one of the largest in the country, partners with faculty and trainees to pursue optimal commercialization of intellectual property to ensure that Mount Sinai discoveries and innovations translate into healthcare products and services that benefit the public.

Icahn Mount Sinai's commitment to breakthrough science and clinical care is enhanced by academic affiliations that supplement and complement the School's programs.

Through Mount Sinai Innovation Partners (MSIP), the Health System facilitates the real-world application and commercialization of medical breakthroughs made at Mount Sinai. Additionally, MSIP develops research partnerships with industry leaders such as Merck & Co., AstraZeneca, Novo Nordisk, and others.

The Icahn School of Medicine at Mount Sinai is located in New York City on the border between the Upper East Side and East Harlem, and classroom teaching takes place on a campus facing Central Park. Icahn Mount Sinai's location offers many opportunities to interact with and care for diverse communities. Learning extends well beyond the borders of our physical campus, to the eight hospitals of the Mount Sinai Health System, our academic affiliates, and globally.

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1st World Summit for Pediatric and Congenital Heart Surgery
Bologna, Italy
https://www.worldsummitpchs2024.org/

19TH-22ND

CSI Frankfurt 2024
Frankfurt, Germany
https://www.csi-congress.org/conferences-courses/conferences/csi-frankfurt

JULY

18TH-21ST

2024 CardioPREP Course
Virtual
https://www.aap.org/en/catalog/categories/primary-care/2024-cardioprep-an-intensive-review-and-update-of-pediatric-cardiology---virtual/

26TH-27TH

CICT 2024
Pasadena, California, USA
https://cictsymposium.com/

AUGUST

18TH-23RD

2024 Pediatric and Adult Congenital Cardiology Review Course
Huntington Beach, California, USA
https://ce.mayo.edu/cardiovascular-diseases/content/2024-pediatric-and-adult-congenital-cardiology-review-course

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