CONGENITAL CARDIOLOGY TODAY

Timely News & Information for Congenital/Structural Cardiologists & Cardiothoracic Surgeons Worldwide



June 2020

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COVID-19 and Congenital Heart Disease

Kamel Shibbani, MD; Ziyad M. Hijazi, MD, MPH, FACC, MSCAI, FAHA; Damien Kenny, MD

Introduction

On April 9, 2020, *PICS-AICS* launched the first in a series of webinars revolving around Interventional Pediatric Cardiology. Due to the ongoing SARS-CoV-2 pandemic, the first webinar focused on the effect of the virus on the world of cardiology as a whole, and pediatric cardiology and cardiac surgery in particular.

The webinar was hosted by Drs. Ziyad Hijazi and Damien Kenny from Sidra Medicine in Doha and Children's Health Ireland at Crumlin in Dublin, respectively. The guests included Dr. Emile Bacha from Columbia University in New York City, Drs. Yong Peng, Jiafu Wei, and Yuan-Ning Xu from West China Hospital in Chengdu, Dr. Victor Sam Lucas from Ochsner Health Center in New Orleans, and Dr. Shyam Sathanandam from LeBonheur in Memphis.

Initially, Dr. Xu spoke about the COVID experience in China from a critical care perspective and shared valuable information about measures taken there to ensure staff safety. These included wards dedicated for COVID-19 patients or Person Under Investigation (PUI) with three specific areas: a contaminated area that serves as the isolation ward, a clean area that serves as office space/work rooms/dressing rooms, and a third area in-between that serves as the buffer zone. In addition, personnel caring for COVID-19 patients would don an impressive amount of PPE (listed from innermost to outermost): Scrubs, N95 mask and disposable cap, disposable shoe covers (first layer), disposable gown, goggles, gloves (first layer), disposable apron, gloves (second layer), disposable shoe covers (second layer) (**Figure 1 and 2**). Donning of all the PPE takes between 10-30 minutes and doffing

A Class II protection equipment(from inside to outside): Scrubs, N95 mask and disposable cap, disposable shoe cover (first layer), disposable gown, goggle, gloves (first layer), disposable apron, gloves (second layer), disposable shoe cover (second layer)



FIGURE 1

A. List of PPE as worn in order from innermost to outermost layer. B. Medical personal after donning all Class II PPE.

C. Division of COVID wards into 3 distinct zones; contaminated zone, clean zone, and buffer zone in between. Photo credit: Dr. Yuan-Ning

takes 10-20 minutes. An extra layer of protection was available in the form of a positive pressure headgear that could be donned over the class II PPE when performing procedures with high risk of viral transmission. Dr. Xu also shared invaluable lessons learned from his experience in the critical care unit that included a trend of hypercapnia noted after initiation of respiratory support, which he hypothesized could be due to inhibition of spontaneous breathing. In addition, some critically-





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COVID-19 AND CONGENITAL HEART DISEASE

ill patients had severe CO2 retention requiring extracorporeal CO2 removal, while some had severe hypoxemia requiring VV-ECMO. He also noted that coagulopathies were common in severe COVID-19 patients, necessitating the use of anticoagulation therapy unless otherwise contraindicated. Finally, Dr. Xu informed the audience that corticosteroids did not play a part in routine management of COVID patients, rather they were reserved for those with rapidly progressive deterioration of oxygenation and/or radiological evidence of excessive inflammation. When used, they were restricted to 3-5 days at doses of no more than 1-2mg/kg/day.

Next, Dr. Wei shared his experience as a cardiologist in the ICU dealing specifically with cardiac consequences of COVID-19. He shed light on the daily assessment tool used for mild/moderate cases to determine the need for (de)escalation.¹ He also noted that severe patients received daily CXR, troponin, BNP, and NT-proBNP with CT performed for any patient requiring escalation of care. Dr. Wei stressed the importance of fluid volume management, especially in the setting of corticosteroid use with mild/moderate cases being maintained at net even fluid balance and severe cases being maintained at a net negative fluid balance. Finally, Dr. Wei talked about the high incidence of pulmonary hypertension noted in COVID-19 patients that required the use of NO and milrinone.

Dr. Peng then shared the lessons he learned during this pandemic, focusing on the unusually high number of people who developed cardiac dysfunction with COVID-19. Most of these patients, Dr. Peng noted, had normal EF on echo and were labeled as HFpEF. Dr. Peng drew a parallel to the SARS epidemic that also saw a higher than expected HFpEF in patients with pneumonia. He also noted that a rise in NT-pro-BNP was more common than a rise in cardiac troponin, suggesting that cardiac dysfunction was more common than cardiac injury. The second point that Dr. Peng talked about was the importance of an intermediate care room that served as both a step-down from the ICU as well as a location to help

with overflow, especially in areas with high COVID burden such as Wuhan. Finally, Dr. Peng opined about the gaps of knowledge regarding the SARS-CoV-2 virus and the lack of effective antivirals as of yet.



FIGURE 2

Positive pressure headgear (Class III PPE) used when performing procedures with high risk of viral transmission. Photo credit: Dr. Yuan-Ning Xu

Dr. Emile Bacha then discussed how to manage the cardiac surgery service in the context of the risk to staff and the reconfiguration that happened with the adult wards in a high COVID-19 prevalent area like NYC. Dr. Bacha revealed that only one operating room was running with only one OR team available to perform surgery. Their case load had decreased to about 20-25% of their normal load. All elective surgeries had been postponed, and a central committee was created and convened daily to decide which operations could proceed. In general, only emergent pediatric cardiac surgeries were being performed like heart transplant and neonates on PGE. From the perspective of staff safety, Dr. Bacha revealed that the PPE for the OR team included N-95 masks for the entire team during all procedures. In addition, screening was carried out on all patients admitted to the hospital with surgical patients screened the day prior to the scheduled surgery. Dr. Bacha discussed the challenges around large redeployment of staff, with an emphasis on redeploying residents and fellows. Attendings have also been redeployed with the caveat that staff that are less dispensable are less readily redeployed. As expected, the children's

hospital had significantly fewer patients than the adult hospital, but the PICU was receiving young adults as overflow. In response to a question about maintaining a "clean area" in the ICU for cardiac patients, Dr. Bacha informed the audience that the high infectious rates in NYC necessitated the admission of SARS-CoV-2 (+) patients to all ICU units. Finally, Dr. Bacha revealed that a recently accepted manuscript, co-authored by several of the pediatric cardiothoracic surgeons in the USA, provides some guidance for triaging cases and would be helpful in this pandemic.²

Dr. Sathanandam next shared his experience from an interventional cardiology perspective. He informed the audience that a manuscript published on April 9, 2020, provides some guidelines for prioritizing catheterization cases based on a tier system (tiers include 1A, 1B, 2, and 3).³ The manuscript also provides examples of resource reallocation from around the country including the reassigning of interventional cardiologists to adult cardiac ICU, as well as possible conversion of some catheter labs into negative pressure isolation rooms to be used as ICU rooms. Dr. Sathanandam also revealed that a questionnaire was recently distributed to pediatric interventional cardiology centers with 56 centers responding. The questionnaire revealed some discrepancy between centers designated as "high COVID-rate" and "low COVID-rate"; for example, "low COVID-rate" centers had significantly less pre-Glenn catheterization cancellation compared to "high COVIDrate" centers. Additionally, simulation for donning/doffing of PPE was carried out in about 30% of centers, with "high COVIDrate" centers being much more likely to perform such simulations. All centers had canceled elective procedures, but were still performing PDA closure in premature infants and ductal stent placement. Finally, three responders had performed cases on COVID (+) or PUI patients - two were atrial septostomy on patients with COVID (+) parents and one was a pericardiocentesis on a 9-year-old COVID (+) child with myocarditis.

Finally, Dr. Lucas shared his experience, and similarly to Dr. Bacha, noted that their

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practice had decreased to about 20% of normal with premature PDA and other emergencies constituting the cases that were still being done. Not unlike other centers, 25% of the pediatric cardiology nursing staff had been redeployed to the adult cardiology side. In addition, all cardiology patients have been cohorted to the cardiac ICU in an attempt to separate these patients.

Presentations were followed by a Q and A session that included questions from the hosts as well as webinar participants.

Q (To Dr. Xu): Can you talk more about the PPE and the low/ non-existent rates of COVID infection among health care workers that you reported?

A (Dr. Xu): We found it extremely important to split the COVID wards into three areas (contaminated, clean, and buffer), with workstations for staff located in the clean area. Additionally, care was taken during removal of PPE, which is a very risky procedure. PPE was taken off in the buffer room and was done very carefully. After removal of PPE, a shower is required before staff can move back into the clean area. In fact, after implementation of these procedures and PPE requirements, there were zero contaminations among the approximately 50,000 health care workers from mid-January onward.

Q (To Dr. Peng): Did you have a wide testing policy in Wuhan or was it only for patients with clinical symptoms present?

A (Dr. Peng): Our experience with the RT-PCR is that there were many false negative results.

A (Dr. Bacha chimed in): We had ~20% false negative rate in New York as well.

A (Dr. Peng again): Because many people will have false negative results, but very few will have false positive, we performed repeat tests on almost all patients. Patients ready for discharge required at least two negative tests performed on separate days prior to clearing them for discharge.

Q (To Dr. Wei): Given the concern for use of ACE-I and ARB, what has your experience been regarding ACE-I and ARB during this pandemic?

A (Dr. Wei): We stopped all ARB and ACE-I and switched to other management strategies like the use of diuretics and CCB. In my experience, we used ARB only with one patient who had severe hypertension and required more than CCB and diuretics.

Q (To Dr. Hijazi): From your position of leadership, can you share some of the steps you have had to take during this pandemic?

A (Dr. Hijazi): The major problem we are facing is the limitation of the rapid testing kits. We have been selective about who to use the rapid test on, choosing only those who require surgery

or have symptoms. Otherwise, we are looking to expand testing for all patients but using the RT-PCR test.

Q (To Dr. Bacha): Is there an argument to be made to identify one hospital in a large metropolitan area to be designated as COVID (-), where regular operations in that hospital can resume as opposed to having several hospitals that all admit COVID (+) patients?

A (Dr. Bacha): That's the ideal situation. There have been some informal discussions about this and some of this has been done, but not in a formal way. This was brought up to the state of NY but at that time they were overrun, and Congenital Heart Disease surgery might not have been a priority for the state just then. As far as I know, no pediatric cardiac center has officially closed down, but in practice a lot of the smaller centers have had their ICU beds taken away by the scale of the COVID invasion. I have personally reached out to CHOP and Boston Children's to help with patients that we couldn't attend to. We offered this option to parents, and I know of a few parents who chose to do that - one family went to Boston Children's and another to Texas Children's.

Q: After we get over this COVID pandemic, do you think we will be testing for this virus routinely before any operation or do you think we will go back to life as we knew it before SARS-CoV-2?

A (Dr. Bacha): In NY, we are moving towards antibody testing next week for all patients and all healthcare workers in the hospital.

A (Dr. Xu): All patients for elective surgery are now getting a very careful epidemiological history taken, and we are also relying on CT scans in patients where we suspect COVID-19, which we feel is more sensitive than the RT-PCR. We also started the antibody testing about one month ago.

Q (from the audience): Can anyone comment on the immune response in patients who have recovered from COVID-19? Are patients getting re-infected?

A (Dr. Bacha): This has been discussed at the hospital leadership level and with our ID leadership, and it is not quite known yet whether infection and recovery confer immunity or if reinfection is possible.

Q (from the audience to our Chinese colleagues): How long are the shifts in the contaminated rooms?

A (Dr. Xu): Typically, not more than four hours, but in emergency situations shifts can go up to 6-8 hours. For example, patients requiring ECMO usually also require 6 to 8-hour shifts.

Q (from the audience): What dose of hydroxychloroquine and Azithromycin was used?

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A (Dr. Wei): We actually do not have a lot of experience with this drug. It was tried on a few patients and one of them developed bradycardia, and its use was subsequently restricted. I think that this drug, like the antiviral drugs being used, does not have enough evidence to support its use quite yet.

Q (from the audience): In relation to the myocarditis that sometimes accompanies this virus, is there any particular therapy that helps?

A (Dr. Wei): We noticed that a lot of these patients developed pulmonary hypertension with decreased return to the left ventricle and subsequent low blood pressures. In these situations, our strategy was aimed at minimizing the pulmonary edema, so we tried albumin infusion with diuretics. Norepinephrine was also used to help maintain the BP.

In general, there was very limited experience from all participants' centers in patients with Congenital Heart Disease suggesting that, to date, clinically relevant infection rates in these patients are low.

The webinar was concluded by the hosts with special thanks to the guests and Venus Medtech for sponsoring the webinar along with the PICS Foundation and Z-event for supporting the technical expertise.

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Telehealth Medicine Use in the Adult Congenital Cardiology Practice

How to Incorporate Telehealth into Your Clinical Practice During These Difficult Times

Jonathan D. Windram, BSc (Hons), MBChB, MRCP; Justin T. Tretter, MD; Ami Bhatt, MD, FACC

The COVID-19 pandemic has changed our lives in ways that we did not envisage just over a month ago. At the time of writing, over 170,000 people have lost their lives worldwide and 4.5 billion people are under quarantine to slow the pandemic.¹ In addition to the acute burden COVID-19 is placing on our emergency rooms and intensive care units, we are also having to adapt our outpatient clinical practice to delay any non-urgent in-person visits in an attempt to limit exposure to patients and providers. As health care providers we find ourselves rapidly transitioning from the normal clinical visit in person to telephone or telehealth visits when appropriate. How do we do this effectively? What tips and tricks are there to performing a telehealth visit well? And with this increasing comfort and experience with telehealth, are we recognizing there may be an increased role for telehealth which outlives this pandemic?

Dr. Windram, Editor of the Adult Congenital Heart Disease (ACHD) Learning Center, had the opportunity to pose these questions and more to Dr. Ami Bhatt, an early adopter of the use of telehealth medicine in ACHD. Dr. Bhatt is the Director of the ACHD program at Massachusetts General Hospital and has been using telemedicine as a routine part of her clinical practice for several years in addition to conducting research in the field (**Figure 1,2**).

Dr. Bhatt's presentation and the subsequent discussion was recorded as a vodcast for *Heart University* (www.heartuniversity. org) and is freely available for the reader to watch on its component site, the *ACHD Learning Center* (Figure 3). While the discussion focused on the Adult Congenital Cardiologist, it can be generalized to both the pediatric and adult cardiologist, all of whom are attempting to rapidly incorporate telehealth into their practice today.

Summary of the Highlights from Dr. Bhatt's Talk and a Portion of the Discussion that Followed

- Telemedicine, be it by phone or video conference, has become the standard of care during the COVID-19 crisis, as it keeps both physicians and patients with complex cardiac disease safe from exposure and allows for continuation of care.
- Conducting a telehealth visit with a patient in their home creates a relaxed environment. This changed dynamic fosters better patient education and aids shared decisionmaking.
- Telemedicine allows for a more patient-centric approach, improving access and overall quality of care.
 - For the physician, it reduces no shows, improves adherence to care plans and increases clinic capacity. It promotes continuous care rather than the sometimes episodic care we experience in our regular face-to-face clinics.
 - For the patient, telemedicine is convenient. It decreases the time and cost expended on clinic visits.
- Wireless and wearable technologies, such as digital heart rate and blood pressure monitoring enhance the telemedicine encounter. Further development of these technologies may aid incorporation of telehealth into routine clinical practice.
- The inpatient clinic visit remains the mainstay of patient care with its ability to provide a thorough clinical examination and detailed cardiac imaging. The incorporation of telemedicine can enhance comprehensive patient care.



FIGURE 1 Dr. Bhatt conducting a telehealth visit.



TELEHEALTH MEDICINE



FIGURE 2 Reasons for Adult Congenital Heart Disease Virtual Care in the Massachusetts General Hospital Adult Congenital Heart Disease Program.

A Portion of the Conversation Between Dr. Windram and Dr. Bhatt

Dr. Windram: Telehealth appears to put the patient's needs foremost with ease of access to the physician being perhaps the most obvious one. It also appears that the dynamics of the patient visit is different within the telehealth visit. How has integrating telehealth into your practice altered the way you conduct the traditional in-person clinic visit?

Dr. Bhatt: That's an interesting question. Certainly, I find that the telehealth visit is more relaxed, and it makes you rethink how you conduct an in-person patient visit. I think most of us in Adult Congenital Heart Disease are good at building a rapport with our patients, but this seems to be enhanced within the telehealth visit.

Dr. Windram: I can see that a telehealth visit would be easier with a patient you know well, but how would you engage with a new patient? Is your approach different in the young patient who is transitioning, and you are meeting for the first time virtually?

Dr. Bhatt: I find that it can be a great opportunity to meet someone on their

own turf, so to speak. It allows the younger patient to have more confidence in interacting with you. A virtual visit with a younger patient can also be quite helpful in the transition visits when they may be still under the care of their pediatric provider. It gives an opportunity for patient education and parents find it helpful to be able to interact with you prior to meeting with you in the adult clinic. It makes the physical transfer to the adult clinic much easier.

Dr. Windram: There is anxiety amongst physicians in how to adopt telehealth as we feel that we must be physically with the patient so that we can examine them. Do you have any tips or tricks on how we can conduct a limited examination within a telehealth visit?

Dr. Bhatt: Well, I think once we are out of this COVID-19 period, we will be able to decide based on guidelines and clinical judgement how often you need to see your patient physically. That can then guide how often you need to see them in the office. Having said that how do I assess them at this time? Well, I look carefully at their face and appearance to gauge how comfortable they are. I let them talk without interruption to see whether they can speak for 30 whole seconds without difficulty, how many times do they breathe in a minute, and are they using accessory muscles. These are signs that you may not pay much attention to in a normal visit, but become more important when it is all you have. Neck veins can be challenging to assess in some but not in others, pedal edema is easy to demonstrate and having someone press on the liver can be helpful if they report that it is tender. You can also show a patient how to feel their radial pulse and you ask them to say the word "now" out loud when they feel the pulse. I have been able to diagnose atrial fibrillation this way and you can also confirm the pulse by asking the patient's partner or relative to also measure the patient's pulse with this technique.

Join us to follow the discussion between Dr. Windram and Dr. Bhatt, and learn how to incorporate telemedicine into your practice. Watch the vodcast for free at: https://www.heartuniversity.org/

What is Heart University?

Heart University aims to be the premier resource for e-learning in congenital and pediatric acquired heart disease. It is a carefully curated open-access library of educational material for all trainees and practicing providers of care to children and adults with congenital heart disease or children with acquired heart disease.²

The website provides free content to a global audience by means of:

- A comprehensive curriculum of training modules and associated testing for trainees
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The site is managed and curated by editorial boards for the component sites (*Pediatric Cardiac Learning Center*, *Adult Congenital Heart Disease Learning Center*) comprised of a well-rounded international group of experts covering a wide range of subspecialties with endorsement from major international organizations in the fields of pediatric and adult congenital heart disease.

How Do I Access Heart University?

You can join *Heart University* for free by visiting https://www.heartuniversity.org/ and sign up on either component site.



FIGURE 3 Access the vodcast on telemedecine in Adult Congenital Cardiology featuring an interview with Dr. Bhatt by Dr. Windram on the ACHD Learning Center within Heart University.

TELEHEALTH MEDICINE

CONTEMPORARY QUESTIONS IN CHD

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Heart University Hosts Historical Event With First Webinar in Series of "Contemporary Questions in Congenital Heart Disease"

Justin T. Tretter, MD and Jonathan D. Windram, BSc (Hons), MBChB, MRCP

It is not hyperbole to state that the first free webinar for the *Heart University Contemporary Questions in Congenital Heart Disease Webinar Series* hosted on May 6th, 2020 was a huge success, and in many ways a historical event in our field of Pediatric and Adult Congenital Heart Disease. The live educational event was attended by 1,374 people from 100 countries spanning six continents. This was a historical event in that it represents the largest gathering, albeit virtual, of congenital heart disease providers for which we are aware of outside of the Quadrennial World Congress of Pediatric Cardiology and Cardiac Surgery. Every form of provider involved in the care of both children and adults was represented; from trainees, to nurses, allied health care professionals, anesthesiologists, congenital heart surgeons, to adult congenital and pediatric cardiologists.

The first webinar covered the topic of *Tetralogy of Fallot: How Can we avoid poor outcomes late after repair?* (Figure 1) To listen to the webinar in its entirety, please visit www.heartuniversity.org or go directly to the listing of each lecture here.

Webinar Moderators

Justin T. Tretter, MD, Cincinnati Children's Hospital Medical Center Jonathan D. Windram, MBChB, University of Alberta Hospital

A poll was conducted at the beginning of the survey asking the following question:

Which cutoff values do you mostly commonly use at your institution to help guide timing for pulmonary valve replacement guidelines in patients with repaired Tetralogy of Fallot?

A. RVEDVi >170 mL/m2, \geq moderate RV systolic dysfunction, RV systolic pressure \geq 2/3 systemic pressure, free pulmonary regurgitation

B. RVEDVi >160 mL/m2, progressive RV systolic dysfunction, severe RVOT obstruction, free pulmonary regurgitation
C. RVEDVi >150 mL/m2, RVESVi >80 mL/m2, RV ejection fraction <47%, RV systolic pressure ≥2/3 systemic pressure, free pulmonary regurgitation
D. Other cutoffs not listed

Of the 446 participants who answered the question, 65 (15%) answered "A" which are the cutoffs proposed by Canadian Cardiovascular Society, 1). 92 (21%) answered "B" which are the

CONTEMPORARY QUESTIONS IN CHD



Contemporary questions in Tetralogy of Fallot: How can we avoid poor outcomes late after repair?

Contemporary Questions in Congenital Heart Disease



FIGURE 1 Tetralogy of Fallot: How can we avoid poor outcomes late after repair?

cutoffs proposed by European Society for Cardiology, 2). 210 (47%) answered "C" which are the cutoffs proposed by Tal Geva, 3). 10 (2%) answered that their institution uses other cutoffs which are not listed, and 69 (15%) were unsure of what cutoffs are used at their institution. So clearly there remains wide variation in the cutoffs used to guide timing of pulmonary valve replacement.

The highlight of the webinar was the contemporary and somewhat contentious questions forming the basis for the six presentations, along with the clear expertise and excellent insight provided by the six panelists.

Presentation Topics and Presenters

"Is annulus-sparing worth the effort?" – Glenn Van Arsdell, MD, University of California – Los Angeles, Mattel Children's Hospital

"Have the guidelines for PVR got it all wrong?" – Andrew Redington, MD, Cincinnati Children's Hospital Medical Center

"Endocarditis: should we abandon the Melody valve?" - Doff B. McElhinney, MD, Lucile Packard Children's Hospital at Stanford

"Why do we do echo's anymore?" – Luc Mertens, MD, PhD, The Hospital for Sick Children in Toronto

"Who should get an EP study/ICD?" – Nico Blom, MD, Center for Congenital Heart Disease Amsterdam-Leiden

"What if I can't afford an MRI machine?" – Krishna Kumar, MD, DM, FAHA, Amrita Institute of Medical Sciences and Research Centre

While those attending the lecture were surely updated on the contemporary understanding of best practice in the management of patients with tetralogy of Fallot, the discussions also set the

framework for future research focus in this population. As the presentations progressed from discussing what may be the best initial complete repair, to the flawed nature of current guidelines for timing of pulmonary valve replacement, towards interpreting the limited data on risk for endocarditis following transcatheter pulmonary valve replacement, the crucial role of echocardiography as the primary imaging modality, and a controversial "substrate tailored approach" to individualized risk stratification of patients with repaired tetralogy of Fallot, it was the last presentation which seemed to resonate most with the global audience. Dr. Krishna Kumar discussed the additional challenges faced when managing patients with tetralogy of Fallot in a limited resource setting, where amongst other facets, the clinician and patient must put deeper thought into the lack of demonstrated survival benefit following pulmonary valve replacement despite suggested thresholds to guide timing. This presentation not only benefited those practicing in resource limited settings, but also raised thought provoking questions to those practicing in settings where limitation of resources is not as much of a barrier.

We thank the panelists and live audience for making this first *Heart University* webinar a success and look forward to continuing along this exciting *Heart University* webinar series.





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The Congenital Heart Collaborative Nationwide Children's Hospital

University Hospitals Rainbow Babies & Children's





Division Chief of Pediatric Cardiology at UH Rainbow Babies and Children's Hospital

The Department of Pediatrics at University Hospitals Rainbow Babies & Children's Hospital (RBCH) in Cleveland, Ohio seeks a nationally recognized leader to be Division Chief of Pediatric Cardiology. Candidates should be at the Associate or full Professor rank. The ideal candidate must have the vision, skills, and experience to oversee the division's missions of clinical excellence, education, and academic advancement. RBCH Heart Center team is comprised of a of physicians (11 cardiologists, three anesthesiologists, four cardiac intensivists, one congenital heart surgeon), nurses and nurse practitioners, and trainees dedicated to serve the patients of Northeast Ohio. Services provided include comprehensive surgical program for children and adults with congenital heart disease, state-of-the-art interventional and EP therapeutics, an adult congenital heart team, dedicated cardiac imaging, cardiac anesthesia, and cardiac intensive care. The Heart Center has a dedicated cardiac step-down unit, a new hybrid catheterization and surgical suite within a long-established children's hospital along with a network of community and regionally based outpatient services. There is a robust pediatric cardiology fellowship program. The successful candidate will be well-supported at a world-class children's hospital with over 60 years of experience in the care of pediatric and adult congenital heart disease patients; an outstanding educational and research enterprise at Case Western Reserve University School of Medicine and an internationally recognized program partner with the Nationwide Children's Hospital Heart Center.

The RBCH Heart Center is partnered with Nationwide Children's Hospital Heart Center in Columbus, Ohio through The Congenital Heart Collaborative (TCHC). This partnership combines resources to provide the most comprehensive highest quality care on both campuses. TCHC is a dedicated service line with a common executive administration and functions as one program on two campuses with the commitment to expand access to high-quality comprehensive cardiac care regardless of patient age to the communities we serve while equally embracing a scholarly and educational mission. TCHC provide excellent cardiothoracic surgical, cardiac interventional, electrophysiologic, and non-invasive services. An example of the success of our partnership is our fetal cardiac interventional service comprised of members from both campuses and based at RBCH.

Interested candidates are encouraged to submit their curriculum vitae to:

Marlene Miller, MD

Pediatrician in Chief and Chair of Pediatrics UH Rainbow Babies and Children's Hospital marlene.miller@uhhospitals.org

Alicia Trybus

Director of The Congenital Heart Collaborative alicia.trybus@uhhospitals.org

Pandemic & Practice: Considerations in Resuming Cardiovascular Activities

Ellen Dillavou, MD; Gustavo Oderich, MD; Athar Qureshi, MD; Darren Schneider, MD

W. L. Gore & Associates has launched a **free four-part series** on lessons learned by physicians amid COVID-19. Pandemic and Practice: A Gore Webinar Series for Medical Professionals, features physicians discussing how they are applying these lessons to improve care protocols, patient communications and teamwork within cardiovascular practices.

In the first session, Considerations in Resuming Cardiovascular Procedures, three panelists joined moderator Darren Schneider, MD, to discuss how they and their facilities are approaching reopening to elective procedures.

The conversation below has been condensed and edited. Full recordings and future sessions will be listed at www.PandemicAndPractice.com.

April 29, 2020 Panelists:

- Ellen Dillavou, MD, Vascular Surgeon, Durham, North Carolina
- Gustavo Oderich, MD, Vascular Surgeon, Rochester, Minnesota
- Athar Qureshi, MD, Adult and Pediatric Interventional Cardiologist, Houston, Texas
- Darren Schneider, MD, Vascular Surgeon, New York, New York (Moderator)

Darren Schneider, MD: Things are getting better in New York, and we're actually having meetings about how to plan our recovery and be able to return to treating patients. What are your key considerations when laying out your timeline and phasing your return to elective procedures?

Ellen Dillavou, MD: We were lucky. We did not have nearly the impact of the COVID-19 pandemic in Durham. It feels like the peak has passed, and so we are now just starting to roll out plans to resume full operations within the next few weeks.

Gustavo Oderich, MD: We have also been blessed with not such a high number of cases. We are now trying to return to more elective practices. We have increased over the last couple of weeks our semi-urgent practice. We still have the direction to not do elective procedures at the present time.

Athar Qureshi, MD: I think we're somewhere in between. We've seen some, a fair degree, of COVID here in Houston in the adult facilities, and only a small number in pediatric facilities. We are now in the process of opening up and in our sort of "ramp-up" phase. As of the end of last week, we can resume elective procedures.

Q (Dr. Schneider): How are you deciding to bring patients back in and dealing with the risk/benefit equation?

A (Dr. Qureshi): It's very easy to decide which cases are urgent, and the elective cases are easy to discern as well. But it is really that middle group, the gray area, or your group where they are semielective.

So we did come up with some guidelines because there was some angst amongst the physicians in terms of which cases should go and which should not. If there was any doubt or any gray areas, we would have conferences amongst the physicians.

A (Dr. Oderich): Our strategy is basically going to be to prioritize in terms of indication and for how long the patient has been waiting. Every case that we are doing that is semi-urgent is reviewed by the Department of Surgery.



A (Dr. Dillavou): We're trying to avoid surgeries that would involve intubations, trying to avoid ICU stays, and trying to do urgent things on an ambulatory basis. Every case is still being carefully considered before it's done in the O.R. All of our patients will have to have a COVID test within 72 hours.

Q (Dr. Schneider): Are you finding that even though you're starting to take patients, that the patients don't feel safe or want to come in because of risks?

A (Dr. Qureshi): Both. We have found patients who've been waiting for a while and are coming, but we are definitely finding patients who are hesitant. What we have started to do is have the physicians call the patients and families themselves and reassure them. Often what we are finding is that they are responsive to that.

A (Dr. Dillavou): We can reassure them and explain how they are safer coming in and getting their disease taken care of, that other patients are being tested, and COVID positive patients are being quarantined away from where they will be. Although we've had a few people refuse, by and large it seems as though most people who are offered procedures are ready to have them. A (Dr. Oderich): Testing has been the key for us - then admitting them if they have negative testing. And we also have established the protocol very well-- how to protect the patient, family, and the staff.

Q (Dr. Schneider): I do think the implementation of telehealth and telemedicine is actually going to be beneficial moving forward. What role is that playing in your practice?

A (Dr. Dillavou): We're being asked to go through and sort out which visits can be safely done by telehealth. I hope that that's part of our future. I think we're all finding new ways to do things remotely, and I'm very hopeful that we continue to do that.

A (Dr. Oderich): One of the areas where telehealth is going to be very helpful is for surveillance [of chronic disease]. This is an area that is going to really come out of all this as maybe a positive thing.

A (Dr. Qureshi): I would agree with you and the other panelists. And I think that this is going to change the way we practice medicine. And in many ways, it will probably make us more efficient.

PANDEMIC & PRACTICE

Each speaker contributed to this panel in a personal capacity based on individual experiences and observations. The views expressed are the speakers' individual opinions and do not necessarily represent the views of the speakers' employers or those of W. L. Gore & Associates, Inc. Please be sure to consult appropriate government, medical and healthcare sources for COVID-19 related guidance applicable to your own medical practice and hospital system.





ELLEN DILLAVOU, MD

Vascular Surgeon Durham, NC, USA



GUSTAVO ODERICH, MD

Vascular Surgeon Rochester, MN, USA



ATHAR QURESHI, MD

Adult and Pediatric Interventional Cardiologist Houston, TX, USA



DARREN SCHNEIDER, MD

Vascular Surgeon New York, NY, USA

CAREER OPPORTUNITIES



Rocky Mountain Hospital for Children's robust **Congenital Heart Program** is celebrating its **11**th **year** in existence. RMHC is home to the largest level IV neonatal unit in the region with 84 beds. Our patients come from a seven-state region to receive care from our board-certified pediatric subspecialists. Rocky Mountain Hospital for Children at Presbyterian St. Luke's Medical is also an ACOG designated Level IV Maternal Care Center and the only facility able to care for Mom and Baby under one roof.

Program Highlights:

- Two star STS program
- Comprised of a collaborative surgical team supported by six pediatric cardiologists, two of whom are board certified in Adult with Congenital Heart
- 20 bed PICU, staffed 24/7 with Board Certified Intensivists
- Multifaceted collaborative team includes perfussionists, advanced practitioners, respiratory therapists and subspecialty physicians

Candidate Qualifications:

- Board Certified in Cardiothoracic Surgery and Fellowship Trained in Congenital Heart Surgery
- Vast firsthand experience with neonatal surgery required
- Accomplished leader with experience in program growth
- Excellent communicator
- Quality Driven

This employed position offers a competitive salary and excellent benefits package with an immediate patient and referral base.

To learn more about our program, please visit: https://rockymountainkidshearts.com/ services/

https://rockymountainhospitalforchildren. com/specialties/cardiology

If you are interested in applying, please send your CV and Cover Letter to: Sandy Barrett VP Physician Recruitment, HCA HealthONE sandy.barrett@hcahealthcare.com





- Written by doctors and their team
- Case studies, articles, research findings
- Submit on your schedule
- Print and electronic
- Published within 3 months of submission
- No fees

- In print and electronic monthly issue
- On our website
- In our monthly email blast
- No cost for CCT to create the ad
- Multiple sizes available



www.CongenitalCardiologyToday.com

BOOK REVIEW

The Journey of an Indian-American Pediatric Cardiologist A Memoir - With Emphasis on Scientific Contributions to the Medical Literature

John W. Moore, MD, MPH

Dr. P. Syamasundar Rao, known as "Syam" by his colleagues, retired recently as, a practicing pediatric cardiologist. On the eve of retirement, he occupied the position of Chief of Pediatric Cardiology at the UT Health McGovern Medical School in Houston and held the rank of Professor of Pediatrics & Medicine. Dr. Rao had a long and distinguished career in Pediatric Cardiology beginning in the 1960's. He was one of the early interventional pioneers and played major roles in developing and studying valvuloplasty and angioplasty, as well as occlusion procedures. He published prolifically about these procedures and about other topics in general cardiology, and he also gave numerous lectures and presentations at professional gatherings. During his career, Dr. Rao held leadership positions in the pediatric cardiology programs in Augusta, Georgia; Riyadh, Saudi Arabia; Madison, Wisconsin; Saint Louis, Missouri; as well as in Houston, Texas. He received numerous awards and recognitions including the Dr. K.C. Chaudhuri Lifetime Achievement Award from the India Institute of Medical Sciences in New Delhi, His childhood and early medical education were in India, and so his life story was eventful well before his career began in the United States.

The Journey of an Indian-American Pediatric Cardiologist more than anything else is an autobiography. Dr. Rao outlines in some detail the path of his life and of his career. He includes a large number of family and personal pictures, as well as professional pictures showing colleagues, trainees, awards and even media coverage he had received. In addition, he devotes much of this book to describing and summarizing some of his most important case reports, editorials, reviews, book chapters and books. Rao includes extensive references in these pages and, in some cases, images of journal indexes in which his publications appeared.

This is a very personal story of a proud and accomplished pediatric cardiologist whose career spanned almost the entire history of our young specialty. Like a number of others in his generation of early practitioners and pioneers, he made significant contributions. Many of these now seem fairly mundane as they have been incorporated into ordinary clinical practice. In addition, Dr. Rao's memoir chronicles his life journey from his early days in India to the United States, a new country with a different culture. Fortunately, his new home embraced him and allowed him to thrive.

A final note: This Memoir was published in January 2020 and is available on Amazon.com, Barnes and Noble, and BookBaby websites: BookShop is offering 25% discount for the first 50 books; Coupon Code: **Y4D77F.** You may search under "The Journey of an Indian".

P. Syamasundar Rao



THE JOURNEY OF AN INDIAN-AMERICAN PEDIATRIC CARDIOLOGIST

With Emphasis on Scientific Contributions to the Medical Literature

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The Journey of an Indian-American Pediatric Cardiologist - A Memoir -With Emphasis on Scientific Contributions to the Medical Literature by P. Syamasundar Rao, MD, BookBaby Publishing, Pennsauken, NJ, 2020





JOHN W. MOORE, MD, MPH

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Medical Leaders of ACHA Initiate Worldwide COVID-19 Study in Adults with CHD

This research study of 70+ ACHD Centers across the globe has been endorsed by the International Society for Adult Congenital Heart Disease.

After seeing that there were no clear and concise data regarding patients with CHD and COVID-19 available across the world, *ACHA's* medical leadership led the way in the creation of a dedicated database that medical providers will be using in the United States and abroad. Thus far, the database includes the following ACHD centers:

- 39 in the United States
- 6 in Canada
- 34 throughout Central and South American, Europe, Asia and Australia

The number of sites participating continues to increase rapidly. All sites either have received or are in the process of receiving IRB Approval, which means that the ethics review committee of the hospital or university has decided that the research study meets all institutional and federal standards and policies.

At each site, data will be entered for adults with CHD who have tested positive for COVID-19 or are presumed positive based on common presenting signs and symptoms associated with COVID-19. Data summaries will be shared with ACHD providers around the world on a regular basis to ensure that providers can all learn from one another's experiences.

ACHA has worked closely with the study investigators, Drs. Jamil Aboulhosn, Adrienne Kovacs and Craig Broberg, to initiate this study. We are very proud to play a key role in this global collaboration of nearly 80 centers worldwide participating in this research study. We are grateful for the speed and focus of the CHD medical community around this global issue.

For more on the impact of COVID-19 on adults with CHD, including all of *ACHA*'s resources, visit **www.achaheart.org/COVID19**. We will be also be providing updates on the database in the future.

Edwards Pauses Enrollments in Pivotal Transcatheter Mitral and Tricuspid Trials in Response to Hospitals' Focus on COVID-19

PRNewswire - Edwards Lifesciences Corporation (NYSE: EW), the global leader in patient-focused innovations for structural heart disease and critical care monitoring, announced it will temporarily pause new enrollments in its active pivotal clinical trials of transcatheter mitral and tricuspid therapies, in response to the urgent COVID-19 response around the globe.

Edwards is coordinating closely with the trials' clinical investigators, and the decision to resume enrollments in the trials will be made in consultation with each investigator and hospital at the time when their clinicians' and patients' needs can be better served. The company continues to pursue its vision of transforming care for patients with mitral and tricuspid valvular disease by developing a portfolio of innovative therapies supported by a growing body of clinical evidence.



Neonatology Today is interested in publishing manuscripts from Neonatologists, Fellows, NNPs and those involved in caring for neonates on case studies, research results, hospital news, meeting announcements, and other pertinent topics.

Please submit your manuscript to: LomaLindaPublishingCompany@gmail.com

CHD and COVID-19

Help us learn more.

Congenital heart disease (CHD) patients and families want to know how for Corona Virus (COVID-19) could affect their child or themselves. Right now, we don't know.

But you can help.

In response to COVID-19, Conquering CHD is committed to learning more about how this virus specifically impacts those with CHD. We are collecting information directly from people with CHD and are asking you to share your experience.

This study is unique.

It collects information directly from people with CHD, of all ages and all types of CHD. Other research that looks at hospital records only identifies those who have become so ill they seek medical treatment as a result of COVID-19. With your help, we can reach adults and children with CHD from across the country with mild, moderate and severe responses to COVID-19, to provide a more complete picture of the impact of COVID-19 on people with CHD.

The information from this survey will not answer everyone's questions about CHD and COVID-19. But it will help us begin to gather, analyze and disseminate information specific to the congenital heart community, both now and in the future.



If you or your child have CHD and have or had symptoms or tested positive for COVID-19, we are asking you to complete a short survey. If you or your child have not tested positive for COVID-19, you may still complete the survey.

- The survey takes roughly 5-7 minutes.
- The person completing the survey must be 18 years of age. Parents or legal guardian can complete the survey on behalf of children under the age of 18.
- The survey does ask for personal health information. We have partnered with data collection and storage leaders ArborMetrix to ensure the safety and security of you or your child's personal information.
- We have partnered with Boston Children's Hospital to assure the excellence of our survey methodology.
- The survey is voluntary, you do not have to participate and can opt out at any time.
- While there is no direct benefit to you for completing the survey at this time, you will be helping us learn more about COVID-19 and CHD so we can provide critical education to medical experts and the congenital heart community.
- The information collected by this survey will be part of a larger longitudinal (long-term) database helping to inform future research. For this reason, if you or your child have not tested positive for COVID-19, you may still complete the survey.



Complete this brief survey today!

A PROGRAM OF Conquering CHD

conqueringchd.org/informchd

MEDICAL NEWS

St. Luke's University Health Network One of the First in the World to Pilot Masimo SafetyNet[™], a Remote Patient Management Solution, to Aid Hospitalized COVID-19 Patients

Masimo (NASDAQ: MASI) announced that St. Luke's University Health Network (SLUHN) is one of the first institutions worldwide to use Masimo SafetyNet[™] to monitor in-hospital patients, as the network seeks innovative solutions to care for the surge of patients infected by COVID-19. Masimo SafetyNet[™] is an innovative, economically-scalable cloudbased patient management platform designed to help clinicians care for patients remotely in hospital settings and in non-traditional settings and circumstances.

The telehealth solution uses a tetherless, wearable single-patient-use sensor to monitor patients with clinically proven Masimo SET[®] pulse oximetry, and is designed to help manage the surge in COVID-19 patients while maintaining the safety of other patients and providers, allowing hospitals to expand patient remote monitoring into alternative care spaces, including overflow locations, emergency recovery facilities, and home care settings.

Aldo Carmona, MD, St. Luke's Senior Vice President of Clinical Innovation and Chairman of the Department of Anesthesia and Critical Care, said, "This technology is game-changing in light of the crush of demand on our hospitals during this COVID-19 pandemic. With this wearable device, we can create temporary, pop-up respiratory monitoring units as needed to meet the changing patient volumes and track employees' health in their homes if they have been exposed to COVID-19, the flu, or any other serious illness."

Designed to track the blood oxygen saturation and respiration rate of patients who are hospitalized or quarantined at home, Masimo SafetyNet combines tetherless SET[®] pulse oximetry with a proprietary remote data capture and surveillance platform accessible from a patient's Android or iOS smartphone or smart device. Monitoring key physiological data can help provide clinicians with an accurate snapshot of a patient's systemic health and facilitates awareness of the need for rapid execution of treatment decisions that can be lifesaving.

Patients are provided with a multi-day supply of single-patient-use sensors and access to the Masimo SafetyNet[™] mobile app. With clinical feedback from St. Luke's led by Dr. Carmona and from University Hospitals led by Dr. Peter Pronovost, Masimo SafetyNet™ has been designed for easy, intuitive use to provide customized, interactive CarePrograms that align with expert guidance on COVID-19. Monitoring data collected by the sensor is shared with the patient's smartphone using a secure Bluetooth[®] connection. Twice daily, or as directed, the CareProgram can be configured to actively notify patients to answer questions such as, "Are you having trouble breathing?" and "What is your temperature?" and pushes these responses along with the monitoring data to clinicians for evaluation. CarePrograms are fully customizable to accommodate each institution's protocols, each patient's needs, and any changes in COVID-19 guidance - and can be updated through the cloud by providers even after being deployed, for maximum flexibility as situations evolve.

In addition to COVID-19 CarePrograms, Masimo SafetyNet[™] can be configured for more than 150 other CarePrograms for use with COPD, heart failure, oncology, and other patients.

On March 30, patients at St. Luke's University Health Network Bethlehem diagnosed with COVID-19 were outfitted with Masimo SafetyNet[™]. Non-COVID-19 patients are also being monitored with this system in general medical-surgical units.

St. Luke's plans to use the Masimo SafetyNet[™] tetherless sensor and cloud-based surveillance system to monitor upwards of 2,000 hospitalized patients and lower acuity cases in the home. These may also include staff and patients who are quarantined at home with the virus.

"Our patients at St. Luke's have the most sophisticated and reliable respiratory monitoring available anywhere," Dr. Carmona says. "We know that continuous physiologic monitoring with Masimo's Patient SafetyNet™ improves outcomes and saves lives. The ability to extend that capability to patients in non-traditional settings and at home during this crisis with Masimo SafetyNet™ is transformative. Only through our relationship with Masimo could this have been possible."

Joe Kiani, Founder and CEO of Masimo, said, "Masimo is proud to be able to work with St. Luke's to help protect the health and safety of medical professionals and the patients they serve during this global pandemic."

For more information, visit: https://www.masimo.com/products/ hospital-automation/surveillance/ safetynet/





Cardiologs Announces Clinical Study to Monitor Cardiac Safety of COVID-19 Patients Via Smartwatches

Trial will Evaluate Use of Cardiologs' AI Platform for QT Interval Analysis of ECG Data from Smartwatches in Patients Receiving Hydroxychloroquine Treatment

PRNewswire - Cardiologs, a global leader in artificial intelligence (AI) for cardiac diagnostics, today announced the launch of a clinical study using the company's ground-breaking AI-based solution to remotely monitor the cardiac safety of COVID-19 patients during hydroxychloroquine treatment via analysis of electrocardiogram (ECG) data gathered from smartwatches. Hydroxychloroquine therapy is associated with the risk of QT prolongation, a specific sign found on ECGs, which can lead to severe cardiac arrhythmias.

The trial will study patients with COVID-19 at the University Hospital of Marseille in France who are being treated with hydroxychloroquine and azithromycin, a drug combination currently being evaluated as a therapy for the coronavirus (SARS-CoV-2). These drugs can cause QT prolongation as a side effect, especially when used together, raising concerns about the risk of arrhythmic death.

"A significant QT prolongation can lead to ventricular arrhythmia and potentially deadly consequences," explained Laurent Fiorina, a cardiologist at the Institut Cardiovasculaire Paris Sud (ICPS) and a medical expert at Cardiologs who initiated the project. "It is thus important to closely monitor the QT interval during this treatment." ECG assessment to monitor the QT interval is the current standard of care to ensure cardiac safety in clinical settings. With COVID-19, monitoring is especially challenging to implement because of the risk of contamination. It is also highly unlikely that it could be applied as a standard to a large population within a short period of time because of the strain on hospital resources.

"The objective of our study is to evaluate a new method for QT measurement using Cardiologs' AI-based solution and ECG data collected via smartwatches," added Professor Jean-Claude Deharo, head of the Cardiac Arrhythmia Department at the University Hospital of Marseille and the principal investigator of the study. "Smartwatches are already used in the clinical setting, but do not have validated QT analysis available. Combining these technologies will enable clinicians to overcome the practical limitations in the context of COVID-19 of the standard cardiac safety strategy that requires heavy patient interaction."

Cardiologs

Al serving cardiology

Each patient in the study will receive a Withings Move ECG Watch linked to Cardiologs' AI platform, which is already CE marked and FDA cleared for QT interval analysis and arrhythmia diagnostics. Throughout the 10-day course of treatment, daily ECG readings will be sent directly from the smartwatch to Cardiologs' AI platform, where the data will be compared to the gold standard ECG measure and analyzed to assess drug-induced cardiotoxic risk as well as arrhythmic events.

"This study has implications for risk management of druginduced cardiotoxicity, even beyond the current COVID-19 and hydroxychloroquine context," said Professor Jag Singh, a cardiologist at Massachusetts General Hospital (MGH), Professor of Medicine at Harvard Medical School, and a scientific advisor to Cardiologs. "Personal ECG sensors could potentially find a role in the management of these patients, but also add value in other routine clinical care, since over 300 commonly used drugs may have similar QT-prolongation risks as hydroxychloroquine."

Cardiologs is exploring the possibility of additional studies involving different wearable ECG monitors with partners in the United States.



CHIP NETWORK

CONGENITAL HEART INTERNATIONAL PROFESSIONALS

The congenital heart professionals network exists to facilitate communications between congenital heart professionals locally, regionally, and globally.

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Funded by Cincinnati Children's Heart Institute

Adult Congenital Heart Association Announces Newest Medical Advisory Board Members

This Group of Top Physicians in the Congenital Heart Disease Field Provides Expert Input and Oversight for the Organization's Activities

The Adult Congenital Heart Association (ACHA) has announced the newest additions to the organization's Medical Advisory Board (MAB), joining dozens of other medical providers specializing in the field of Adult Congenital Heart Disease (ACHD) care. ACHA MAB members play a crucial role in offering expert opinions on research and medical developments in ACHD and the needs of the ACHD population (approximately 1.4 million Americans) to assure that organizational policies meet the highest standards of scientific need and accuracy.

"We are incredibly excited for the addition of this group to the *ACHA* Medical Advisory Board and look forward to the expert input and oversight they will provide," said *ACHA* President/CEO Mark Roeder. "The remarkable contributions they have brought to the field of adult congenital disease are a tremendous asset to our organization."

ACHA's MAB members are physicians, physician assistants, nurses, nurse practitioners and psychologists who all specialize in ACHD, bringing their unique expertise and perspectives by participating with the ACHA Board of Directors and staff. They offer critical information to assist with unique questions from ACHA members, provide crucial education through our webinars and conferences, and consistently share the positive information about the services provided by ACHA.

About the Adult Congenital Heart Association (ACHA)

The mission of the *Adult Congenital Heart Association (ACHA)* is to improve and extend the lives of the millions born with heart defects through education, advocacy and the promotion of research. Founded in 1998, *ACHA* is an organization begun by and dedicated to supporting individuals and families living with Congenital Heart Disease and advancing the care and treatment available to the community.

For more information, contact **888.921.ACHA** or visit **www.achaheart.org**. Follow us on social media:

Facebook www.facebook.com/AdultCongenitalHeartAssociation/ Twitter https://twitter.com/acha_heart Instagram https://www.instagram.com/acha_heart/



New Members

ARI M. CEDARS, MD

Director of the Johns Hopkins Adult Congenital Heart Disease Center at Johns Hopkins University Hospital in Baltimore, MD, USA



PETER ERMIS, MD, FACC

Medical Director of the Adult Congenital Heart Disease Program at Texas Children's Hospital and Baylor College of Medicine in Houston, TX, USA



JONATHAN N. MENACHEM, MD

Director of Advanced Congenital Cardiac Therapies (ACCT), Heart Failure and Transplantation Section, at Vanderbilt University Medical Center in Nashville, TN, USA



JEREMY NICOLARSEN, MD, FACC

Director of the Providence Adult and Teen Congenital Heart Program (PATCH), Providence Center for Congenital Heart Disease, Providence Sacred Heart Medical Center and Children's Hospital in Spokane, WA, USA



FRED M. WU, MD

Assistant Professor of Pediatrics, Harvard Medical School, and Attending Cardiologist, Boston Adult Congenital Heart and Pulmonary Hypertension Service, Boston Children's Hospital/Brigham & Women's Hospital in Boston, MA, USA

MEETING CALENDAR

JULY

14-15

Plenareno Heart Congress 2020 Dubai, United Arab Emirates https://heart.plenareno.com/

24-26

24th World Congress on Heart Disease International Academy of Cardiology

Boston, MA, USA https://cardiologyonline.com/wchd2020/index.html

AUGUST

21-22

2nd Annual Catheter and Surgical Therapies for Atrial Fibrillation (CAST-AF)

Chicago, IL, USA https://northwestern.cloud-cme.com/default.aspx?P=0&EID=78731

23-28

Pediatric and Adult Congenital Cardiology Review Course 2020

Dana Point, CA, USA https://ce.mayo.edu/internal-medicine/content/pediatric-and-adultcongenital-cardiology-review-course-2020

27-29

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