

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

nely News & Information for Congenital/Structural Cardiologists & Cardiothoracic Surg

North American Edition Vol. 20 - Issue 10

October 2022

Table of Contents

- 1 Rwanda: My Memories Regarding Pediatric Cardiology and More Jacek Bialkowski, MD; Małgorzata Szkutnik, MD; Emmanuel Rusingiza, MD
- 6 A Heads-Up to Our Readers: Do You Know What a Valuable Resource the Congenital Cardiology Today Program Directory Really Is? John Moore, MD
- 9 Lymphatics and So Much More Kamel Shibbani, MD
- 12 Cuffless Blood Pressure Monitoring – Remote Devices are Changing the Research Landscape Jiang Li

15 Medical News

- 3D Printed, Bioinspired Heart Valves
- US to See a Staggering Number of Cardiomyopathy Cases by 2031 According to GlobalData

18 Meeting Calendar

Career Opportunities Throughout

Rwanda: My Memories Regarding Pediatric Cardiology and More

Jacek Bialkowski, MD; Małgorzata Szkutnik, MD; Emmanuel Rusingiza, MD

My interest in the development of the field of pediatric cardiology in Rwanda has been growing since 2018, when I visited this country for the first time.¹⁻³ Rwanda is a small, beautiful, and mountainous Central African country (**Figure 1**) with a difficult and complex contemporary history and a population of 12.5 million people, with the highest concentration of inhabitants (mainly children) in this region of Africa.

The capital city of Rwanda, Kigali, which is located in the center of the country, has two cardiology centers: King Faisal Hospital (KFH), which is the national reference for cardiology interventions (cardiac surgery and catheterization), and has acquired a new catheterization laboratory (November 2020). This enables visiting humanitarian medical operators from abroad to perform surgeries. The second is Kigali University Teaching Hospital (CHUK), a major public tertiary level hospital, located in Kigali City and where the two pediatric cardiologists are based. Humanitarian missions organized by Chain of Hope Belgium Charity Foundation are still conducted in KFH twice a year, where simple Congenital Heart Diseases (CHD), like Atrial Septal Defect (ASD), Patent Ductus Arteriosus (PDA) and Pulmonary Valve Stenosis are treated percutaneously.⁴ From 2008-2017, a cardiothoracic surgery program of ten international humanitarian missions (mainly by Brigham and Woman's Hospital from Boston, USA) took place in KFH, during which 200 valves were implanted in 149 patients with Rheumatic Disease (RHD).⁵ However, although the majority of pediatric patients mostly with CHDs are treated in Rwanda during humanitarian missions, there are still a large number of patients with CHD and RHD being surgically treated outside Rwanda (in India, France, Israel and Egypt) with support of the Rwandan government and humanitarian organizations.



FIGURE 1 Sunset in Rwanda

period, we gave several lectures in KFH and CHUK on our experience in percutaneous treatment of CHD. Special attention was paid to problems of ventricular septal defects closure, both congenital and postinfarction (PIVSD). Our experience with 28 patients with device closures of PIVSD indicates that such fragile defects should be treated with device closure after at least three weeks of initial septal rupture healing, when the procedure is much more effective (publication in preparation). We also participated in the outpatient clinic activities at CHUK with Dr. Rusingiza, where we saw the real and

This time, I was invited to Rwanda along with Professor Malgorzata Szkutnik, MD, by the Director of KFH, Professor Milliard Derbew, and Dr. Emmanuel Rusingiza, Senior Lecturer at the School of Medicine and Pharmacy, University of Rwanda and Pediatric Cardiologist at CHUK. This was possible with support from the Medical University of Silesia, Poland (our workplace). During this

OCTOBER 2022

North American Edition

Vol. 20 - Issue 10

TABLE OF CONTENTS

- 1 **Rwanda: My Memories Regarding Pediatric Cardiology and More** Jacek Bialkowski, MD; Małgorzata Szkutnik, MD; Emmanuel Rusingiza, MD
- 6 A Heads-Up to Our Readers: Do You Know What a Valuable Resource the Congenital Cardiology Today Program Directory Really Is? John Moore, MD
- 9 Lymphatics and So Much More Kamel Shibbani, MD
- 12 Cuffless Blood Pressure Monitoring Remote Devices are Changing the Research Landscape Jiang Li
- 15 Medical News
 - 3D Printed, Bioinspired Heart Valves
 - US to See a Staggering Number of Cardiomyopathy Cases by 2031 According to GlobalData
- 18 Meeting Calendar

Career Opportunities Throughout







INTRODUCING THE **G-ARMOR STENT® PORTFOLIO** Part of the CP Stent[®] Family

Treat a Broader Range of Patients

The G-ARMOR Stent[®] maintains a greater than 13% longer stent length after expansion¹

Indications for Use: G-ARMOR Stent®, G-ARMOR Covered Stent™, G-ARMOR Mounted Stent™, G-ARMOR Covered Mounted Stent™

The G-Armor Stent[®] is indicated for use in the treatment of native and/or recurrent coarctation of the aorta involving a compliant aortic isthmus or first segment of the descending aorta where there is adequate size and patency of at least one femoral artery and balloon angioplasty is contraindicated or predicted to be ineffective. The G-ARMOR Covered Stent[™] is indicated for use in the treatment of native and/or recurrent coarctation of the aorta involving the aortic isthmus or first segment of the descending aorta where there is adequate size and patency of at least one femoral artery associated with one or more of the following: acute or chronic wall injury; nearly atretic descending aorta of 3 mm or less in diameter; a non-compliant stenotic aortic segment found on pre-stent balloon dilation; a genetic or congenital syndrome associated with aortic wall weakening or ascending aortic aneurysm. The G-ARMOR Covered Stent[™] is indicated for use in the treatment of right ventricle to pulmonary artery (right ventricular outflow tract) conduit disruptions that are identified during conduit pre-dilatation procedures performed in preparation for transcatheter pulmonary valve replacement.

Please see the Instructions for Use for a full prescribing information including a warnings, precautions and contraindications at www.bisusa.com/garmorifu

Distributed by: B. Braun Interventional Systems Inc. | Part of the B. Braun Group of Companies | Bethlehem, PA 18018 | USA | Tel 877-836-2228 | Fax 610-849-1334 | www.bisusa.com © 2022 B. Braun Interventional Systems Inc.



G-ARMOR and CP-STENT are registered trademarks of NuMED, Inc.

Rx Only.

¹ Data on file. B. Braun Interventional Systems (2022). CP Stent versus G-ARMOR Stent Foreshortening Data.



FIGURE 2 Pride of impala antelopes in Akagera National Park, Rwanda



FIGURE 3 King bull in Nyanza, Rwanda

enormous number of children with CHD and RHD needing proper treatment. Moreover, we were surprised by the high number of patients with genetic disorders coexisting with CHD (Downs, Noonan, Williams Syndromes, etc.). Rwanda developed quickly and is a well-organized and safe country, in which the worldwide conference of Commonwealth Heads of Government Meeting



FIGURE 4 Center for Blind Children in Kibeho, Rwanda

(CHOGM) was held in June of this year (53 countries participated in this event) in Kigali City.

During the weekend we visited several popular sites. The most impressive was a safari in Akagera National Park (Figure 2).

As Rwanda history is very interesting, we visited the King's Palace in Nyanza with famous traditional bulls with big white horns (Figure 3).

We also visited Kibeho, a pilgrimage site dedicated to Virgin Maria, where there is also a shelter for more than 150 children who are blind, some of them are albino (**Figure 4**).

The shelter, which was built by and continuously supported by the Polish government, is conducted by Catholic Franciscan Sisters. They deserve recognition as they are very well-prepared for this calling. This is a branch of a similar organization for people who are blind in Laski, Poland.

In conclusion, there is potential for development of Pediatric Cardiology in Rwanda. However, much has to be done, especially development of cardiac surgery and interventional cardiology of CHD. A call for advocacy to address the burden of pediatric heart diseases in Africa has been made for many years.⁶

References

- Bialkowski J. Mobile Cathlab for the Treatment of Congenital Heart Defects – is it a Real Idea? My Own Experience and Example of Rwanda. Congenital Cardiology Today 2018, 16, 9-13.
- Bialkowski J. Interventional Catheterization for Congenital Heart Defect: What Can We Do for Others? Project Rwanda. Adv Interv Cardiol 2019, 15 (57): 385-6.
- 3. Białkowski J, Szkutnik M, Rusingiza E. Report from the Visit in the Cardiology Centers in Kigali, Rwanda. Adv Interv Cardiol 2022 (in press).
- 4. Senga J, Rusingiza E, Mucumbitsi J et al. Catheter Interventions in Congenital Heart Diseases Without Regular Catheterization Laboratory Equipment. The



RWANDA: MY MEMORIES REGARDING PEDIATRIC CARDIOLOGY AND MORE

Chain of Hope experience in Rwanda. Ped. Cardiol. 2013, 34, 39-45.

- Swain J, Sinnott C, Breakey et al. Ten-Year Clinical Experience of Humanitarian Cardiothoracic Surgery in Rwanda: Building a Platform for Ultimate Sustainability in Resource-Limited Setting. J Thorac Cardiovasc Surg 2018, 155, 2541–2550.
- 6. Binagwaho A, Rusingiza E K, Mucumbitsi J, Wagner C M et al. Uniting to Address Paediatric Heart Disease in Africa: Advocacy from Rwanda. SAHeart 2013;10:440-446.



MAŁGORZATA SZKUTNIK, MD

Congenital Heart Diseases and Pediatric Cardiology Department Silesian Center for Heart Diseases in Zabrze Medical University of Silesia Poland



JACEK BIALKOWSKI, MD

Congenital Heart Diseases and Pediatric Cardiology Department Silesian Center for Heart Diseases in Zabrze Medical University of Silesia Poland jabi_med@poczta.onet.pl



EMMANUEL RUSINGIZA, MD

University Teaching Hospital of Kigali University of Rwanda Rwanda

> CONGENITAL CARDIOLOGY

> > TODAY

Publish

- Written by fellows, doctors and their team
- Case studies, articles, research findings, reviews and human interest
- No publication fees
- Print and electronic
- Published within 3-6 months of submission
- Fellows: turn PowerPoint decks into articles

Subscribe Electronically Free on Home Page www.CongenitalCardiologyToday.com



CAREER OPPORTUNITY



Department of Pediatrics UNIVERSITY OF WISCONSIN SCHOOL OF MEDICINE AND PUBLIC HEALTH

Pediatric Interventional Cardiologist



NOW HIRING!

CHS, CT or Tenure Track

Assistant, Associate or Full Professor



Scan or Click QR code to view position description

Scan above to Apply, or if questions:

J. Carter Ralphe, MD

Professor of Pediatrics Chief, Pediatric Cardiology University of Wisconsin School of Medicine & Public Health

(608) 262-1603 jcralphe@pediatrics.wisc.edu The Department of Pediatrics at the University of Wisconsin School of Medicine and Public Health is recruiting for a full-time **Pediatric Interventional Cardiologist** to join its Division of Pediatric Cardiology.

The Congenital Heart Program is a dynamic and growing service that is a recognized leader in the field, providing outstanding care from fetal life through adulthood. Diagnostic and interventional cardiology services are provided in a state-of-the-art hybrid lab supported by two cardiothoracic surgeons, 20 cardiologists and advanced practice providers, outstanding non-invasive imaging services, cardiac anesthesiologists, and intensivists. The program is notable for its highly collaborative and inclusive culture with a focus on team and individual excellence in the pursuit of remarkable care for our patients and their families.

The Department of Pediatrics is a vibrant academic department comprised of more than 200 faculty in 17 subspecialty divisions. The department offers a full range of pediatric inpatient and outpatient care at the UW Health Kids' American Family Children's Hospital, community hospitals, and outreach clinics statewide. The University of Wisconsin–Madison provides a highly acclaimed academic environment that actively supports research and innovation.

The successful candidate must hold an MD or equivalent and have completed a US pediatric residency, pediatric cardiology fellowship, and additional training in interventional cardiology. Interest in academic medicine, involving teaching a variety of learners, is essential. Identification and the nurturing of future clinician-scientists is a high priority. Applicants with developing academic interests will be given careful consideration. WI medical licensure; BC/BE in pediatric cardiology required.

The University of Wisconsin–Madison is known for its beautiful lakeside setting, top-rated record of federal research funding, and excellence in teaching at all levels. The city of Madison (pop. 263,332) is the state capitol and boasts a high quality of life, including excellent schools, housing, clean air, and abundant year-round recreational and cultural opportunities.

pediatrics.wisc.edu/careers

A Heads-Up to Our Readers: Do You Know What a Valuable Resource the Congenital Cardiology Today Program Directory Really Is?

John Moore, MD

Congenital Cardiology Today has published and posted a Program Directory of congenital and pediatric cardiac care providers in North America for more than a decade. We provide it to our readers without charge on Congenital Cardiology Today's website homepage, <u>CongenitalCardiologyToday.com</u>. The Directory provides current data as the Directory is updated annually in August.

This Directory lists over 130 programs including all of the major ones in the United States and Canada. For each program, the Directory provides: the address, phone number and fax; the director's name and contact information; names of affiliated pediatric cardiologists and congenital heart surgeons; as well as information about available training programs. If there is a pediatric/congenital cardiology ACGME fellowship program, the program director's name and contact information is provided. Programs in the United States are organized according to the city and state where they are located. Canadian Programs are listed alphabetically by location.

The Directory is useful for making patient referrals, locating and contacting colleagues, identifying training programs for young physicians, etc. If you know about it, you will probably print it and refer to it on a daily basis. Take a look. You'll be glad you discovered this valuable resource!



JOHN MOORE, MD

Medical Editor Congenital Cardiology Today jwmmoore1950@gmail.com



FIGURE 1 The Program Directory's Cover as it appears on the CCT website homepage, <u>CongenitalCardiologyToday.com</u>

CHIP NETWORK



Connecting Congenital Heart & Pediatric Cardiac Professionals Across the Globe

United States

Alabama

Birmingham

Children's of Alabama/

University of Alabama at Birmingham Pediatric and Congenital Heart Disease Center of Alabama 1700 6th Ave, S, Ste 9100 Birmingham, AL 35233 www.childrensal.org/heart

Division Chief of Pediatric Cardiology Yung R. Lau

P. 205.934.3460 F. 205.975.9081 E. YLau@peds.uab.edu

Pediatric Cardiologists

Waldemar F. Carlo Leslie Collins Marc Cribbs Camden L. Hebson Walter H. Johnson Austin M. Kane Yung R. Lau Mark Law William S. McMahon F. Bennett Pearce Robb Romp Khalisa Syeda Hayden Zaccagni **Congenital Heart Surgeons** Robert J. Dabal, Director of Surgery

David Cleveland Robert Sorabella Pediatric Cardiology Fellows 3 ACGME

1 CVICU

Craig Cohen

Arizona

Phoenix

Phoenix Children's Hospital Children's Heart Center 1919 E. Thomas Rd. Phoenix, AZ 85016 www.phoenixchildrens.com **Division Chief of Pediatric Cardiology** Wayne Franklin P. 602.933.3366 F. 602.933.4264 E. WFranklin@phoenixchildrens.com Fellowship Director Andrew Papez P. 602.933.3366 F. 602.933.4264 E. APapez@phoenixchildrens.com Associate Fellowship Director Byron Garn P. 602.933.3366 F. 602.933.4264 E. BGarn@phoenixchildrens.com Pediatric Cardiologists Jordan Awerbach Deepti Bhat

Damon Dixon Erik Ellsworth Wayne Franklin Byron Garn Joseph Graziano Ryan Johnson Christopher Lindblade J. Carlos Macias Erika McLaughlin Neda Mulla Todd Nowlen Andrew Papez Robert Puntel Edward Rhee Arash Sabati Bethany Wisotzkey Steven Zangwill **Congenital Heart Surgeons** Mohammad Alaeddine ?oosev∈ ⊰ryant vier G n le L niel V le.

tric (ara ole jy l ollov

9 A `GN

Tucson

University of Arizona Health Sciences Ctr. Division of Pediatric Cardiology 1501 N. Campbell Ave, PO Box 245073 Tucson, AZ 85724 **Division Chief of Pediatric Cardiology** Scott E. Klewer P. 520.626.5585 F. 520.975.6291 E. SKlewer@peds.arizona.edu Pediatric Cardiologists Brent Barber

Andrew Hoyer Scott E. Klewer Ricardo Samson Mike Seckeler **Congenital Heart Surgeon**

Kenneth Fox

Arkansas

Little Rock

Arkansas Children's Hospital 1 Children's Way Little Rock, AR 72202 www.archildrens.org **Division Chief of Pediatric Cardiology** Paul Seib P. 501.364.1479 F. 501.364.3667 E. Seibpaulm@uams.edu Fellowship Director Josh Daily E. Jadaily@uams.edu Pediatric Cardiologists Michael Angtuaco Sylvia S. Angtuaco

Lindsay Arthur Thomas H. Best Rupal Bhakta Tanmay Bhamare Elijah Bolin Renee A. Bornemeier Harrison Cobb Tyler Cunningham Joshua Dailey Srikant Das Amy Dossey Brian K. Eble Eudice E. Fontenot Elizabeth A. Frazier Xiomara Garcia Scott Gatlin Kevin Hinkle Kenneth Knecht Sam Lee Sh envierves M hele M. Moss Pa _____dhan Ar ha Qasim M kus Renno Paul M. Seib Dala Zakaria Cardiac Surgeons Lawrence Greiten Brian Reemsten Pediatric Cardiology Fellows 6 ACGME 2 CVICU 1 Advanced Imaging

California

Loma Linda

Loma Linda University Children's Hospital 11234 Anderson St, Rm 4433 Loma Linda, CA 92354 https://lluch.org/locations/loma-lindauniversity-childrens-hospital **Division Chief of Pediatric Cardiology**

Michael Kuhn P. 909.558.4711 F. 909.558.0311

E. MKuhn@llu.edu **Pediatric Cardiologists**

Erik Frandsen Upinder Jodhka **Gregory Jutze** Ahmed Kheiwa Michael Kuhn (Chief) Jesse Lee Jennifer I o Ravi Mandapati (EP Director) Shireen Mukadam Steve Nageotte Natalie Shwaish Jade Tran Sonia Voleti (Continued on p. 6)

FIGURE 2 Typical page from the Directory listing programs in Alabama, Arizona, Arkansas and California.



NEW Opportunity Chief of Pediatric Cardiac Intensive Care

Driscoll Children's Hospital – Heart Center in Corpus Christi, Texas, is recruiting an experienced leader with a commitment to excellence to serve as Chief of Pediatric Cardiac Intensive Care. The ideal candidate, MD/DO, will be dual boarded by the American Board of Pediatric Critical Care Medicine and Pediatric Cardiology and have at least five (5) years of post-fellowship experience in pediatric cardiac critical care and proven history in a leadership role with vision and strategic planning.

The Driscoll Heart Center team includes inpatient and outpatient cardiologists specializing in Echo, Fetal, CMR, Imaging, electrophysiology, interventional cardiology, congenital cardiac surgeons, cardiac anesthesiologists, and intensivists. As a result of our rapid growth and expansion the CICU will increase to 34 dedicated beds in the next eighteen months.

Successful applicants will enjoy a highly competitive compensation package, sign-on bonus, comprehensive medical benefits, disability and life insurance, retirement plans, generous paid vacation days, paid holidays, CME allowance & days off, and malpractice insurance.

About Driscoll Children's Hospital

Driscoll Children's Hospital is a 191-bed pediatric tertiary care center with pediatric specialists representing 32 medical and 13 surgical specialties offering care throughout South Texas, including Corpus Christi, the Rio Grande Valley, Victoria, and Laredo. The hospital remains the only, free-standing children's hospital in South Texas with the first emergency room created specifically for pediatrics. The hospital provides comprehensive pediatric services including NICU, PICU, and more than 40 pediatric subspecialists. Driscoll Children's Hospital maintains a teaching affiliation with Texas A&M University Health Science Center and has a pediatric residency (45 plus residents).

About Corpus Christi, Texas

Corpus Christi, Texas is a wonderful place to work, live and play! It is a dynamic coastal city that offers great schools, K- 12 (five independent school districts within the city) and higher education, Texas A&M University -Corpus Christi and Del Mar College and Coastal Bend College. The cost of living is low and there is no state income tax. Corpus Christi is currently ranked as one of the most affordable places to buy a home in the USA. The mild climate allows for year-round outdoor fun. Enjoy miles of beaches, parks, hiking/biking trails, shopping, dining, festivals, sporting events and more.

Apply Today!

Lori.smith@dchstx.org

Director of Physician Recruitment 361.694.5906 – direct line



Lymphatics and So Much More

Kamel Shibbani, MD

We recently had the pleasure of sitting down with Dr. Yoav Dori, MD, PhD, Director of the Jill and Mark Fishman Center for Lymphatic Disorders at Children's Hospital of Philadelphia. Our conversation very nicely summarized the state of the field of lymphatics at the moment. Dr. Dori highlighted the importance of lymphatics and Congenial Heart Disease, the options for lymphatic imaging at the moment, and available treatments for lymphatic disease.

KS: Dr. Dori, thank you so much for the opportunity to chat about this growing and exciting field! Can you tell us a little bit why is it important to understand lymphatics, in particular when talking about patients with Congenital Heart Disease?

YD: Until now, most cardiology trainees did not get much exposure to lymphatics. There's a reason why this was called the forgotten circulation. However, it plays a very important role in everything we do! In the past, it was difficult to image the lymphatic system and to intervene upon it, so people just ignored it. We have, however, an entire population of patients with severe lymphatic dysfunction. I got into this field because we had a patient with plastic bronchitis, a disease that was historically considered to have a 50% mortality. Early on, there were hints of lymphatic involvement in the development of plastic bronchitis, so we started looking into the possibility of using MRI to better study this system. However, traditional imaging alone was not enough.

We did animal studies at Hopkins and developed the technique called intranodal dynamic contrast MR lymphangiography. When dealing with a circulatory system, you need to define anatomy, flow, and hemodynamics - or in this case lympho-dynamics. Dynamic contrast lymphangiography allowed us to study anatomy and flow, and we had the techniques to enter the lymphatic ducts and understand hemodynamics. We were able to start developing more selective procedures to understand how the lymph system plays a part in different diseases. This allowed us to better understand its role in PLE, chylothorax, and plastic bronchitis, as well as its role in heart failure, ascites, edema, and many other diseases.

KS: Where do we stand now with disease process like plastic bronchitis with respect to prognosis?

YD: We're submitting a paper about plastic bronchitis that shows that survival for patients is now between 90-95%. In reality, we are now at a point where we expect to be able to treat almost all patients with plastic bronchitis. That is a complete paradigm shift in the disease. The same applies for chylothorax, where we can fix almost all of those as well. PLE (protein losing enteropathy) is proving to be more difficult. Though even for PLE, we are looking at close to 70-80% ability to control and even resolve it. The one disease that is a little more complicated is multi-compartment lymphatic failure. And while it is more difficult to treat than isolated lymphatic dysfunction, we have multiple treatment options that have significantly reduced mortality even in these most complicated patients.

KS: You mentioned intranodal lymphangiography as a turning point in the field of lymphatics. Can you talk to us about the role that other imaging modalities have played in the understanding of the lymphatic system? **YD:** Imaging has been integral in discovering the pathology of the lymphatic diseases in CHD. Imaging of both flow and anatomy was absolutely key in this. The main streams that are supplying the thoracic duct are the liver, lungs, and the mesentery. The liver contributes about 40% of lymphatic flow in healthy patients, though that can increase significantly in patients with heart failure. Liver lymphatics can now be visualized through intra-hepatic dynamic imaging, and that is what allowed us to understand the the etiology of PLE to a large extent. The mesenteric lymphatics, which play a big role in ascites, had historically never been imaged. We have developed a method of imaging mesenteric lymphatics through the use of intra-mesenteric lymphangiography.





Kamel Shibbani, MD

Yoav Dori, MD, PhD

"Plastic bronchitis was historically considered to have a 50% mortality [...] Survival for patients with plastic bronchitis is now between 90-95% [...] That is a complete paradigm shift in the disease process"

Yoav Dori, MD, PhD

KS: What is the prognostic value of understanding different lymphatic disorders and lymphatic anatomies in patients with CHD?

YD: As our understanding of lymphatics grew, we started classifying lymphatic disorders of the chest based on T2 imaging and dynamic contrast lymphangiography. What we found is that T2 imaging proves to be an excellent predictor of which patient will have a successful Fontan based on the location of the lymphatic abnormalities in the lungs. This is something we now use to classify patients into those at high risk of Fontan failure. As far as the dynamic imaging, we use that as a guide to understand what interventional procedures these patients would potentially benefit from after they undergo surgical palliation. We have also started categorizing the liver lymphatics as well to help guide post-surgical management.



THE PICS SOCIETY

KS: What is your screening protocol for single ventricle patients?

YD: We screen our patients twice, once before the Glenn and another time before the Fontan. At a minimum, each and every single-ventricle patient should have a screening done before the Fontan with a T2 weighted MRI scan.

KS: Is there a process in place of helping other centers perform some of the lymphatic work that your group has pioneered?

YD: We have taken the approach that our job is to make sure that this knowledge is disseminated, and we've put in a huge amount of effort to do that. Anyone who wants to come to our center is welcome, and we have made it a point to start training people from all over the world. People come for a week or two, learn the techniques, and after they go back home, we set up regular zoom conferences where we discuss the patient images and what needs to be done next. Some people have come here to train on interventional techniques, and in other cases we have travelled to centers to train people if they cannot come to us. Typically, someone can learn to do the basic imaging techniques in a few weeks.

KS: Can you talk to us about some of the interventions that can be offered to patients in whom a lymphatic disorder has been identified?

YD: This is another area where the field is evolving rapidly. In the beginning, there was only thoracic duct embolization. And while this is a simple procedure and could be helpful in some, it can be very harmful in a single-ventricle patient. This led to the development of tools to allow us to do selective procedures. Today, with the exception of placing valves, we've been able to do the same types of interventions in the lymphatic system that we do in the cardiovascular system; we've stented vessels, ballooned vessels, occluded vessels, embolized vessels, etc. We've also developed tools to decompress the lymphatic system in the cath lab, something that was originally done surgically by Dr. Hraska. So, interventions are much more focused nowadays and tailored to the problem.

In addition, there's also advancements with medical interventions. As more research is getting done and as more people get involved, we will get better at understanding the problem and at developing more targeted treatments. KS: Dr. Dori, if you would allow us to switch gears a little bit, I was wondering what advice you have for early career interventionalists who are looking to do meaningful research. This does not have to be specific to lymphatics. In general, how do young interventionalists interested in research ensure that they are doing impactful work? How do you create a niche for yourself? When you look at the scope of what your group has done in lymphatics, achieving something similar seems like an impossible task...

YD: It is absolutely not an impossible task. The only "impossible" part is that your mind is already projecting the outcome and thinking "this is impossible, how can I get there?!" If you start by allowing your mind to project the enormous task at hand, the need to develop or create an entirely new field of research, for example, you've already lost.

Marlys Witte, one of my favorite people on the planet, started the Ignorance University. What she's done in the latter part of her life is to teach students how to just ask questions, how to be comfortable with not knowing, and how to ask questions about things you do not know. And that is the single most important aspect of this whole process. And with the ability to ask questions comes humility, which is absolutely needed for this process also. If you look at the world from the correct perspective, you will see that ignorance is infinite, and knowledge is nothing in comparison. Every single thing we do is based in ignorance, it starts from a complete lack of understanding of a phenomenon.

So to create a niche, the only thing you need to do is to have humility and ask questions. Understand that you don't know everything and just start investigating. Don't take things for granted, and, maybe most important, don't fixate on a specific result. It is perfectly fine to have a vision but fixating on a result that must happen will almost never work out.

KS: This reminds me a little bit of the advice that Kary Mullis, the chemist who discovered polymerase chain reaction (PCR), gives in his book "Dancing Naked In The Mind Field". He says that instead of setting up an experiment that tries to solve the entire problem from the getgo, start by solving for a small question. Come up with any reasonable hypothesis to a simple question that relates to the problem, then try to disprove it. Make adjustments to your hypothesis and repeat the process. And keep doing that until you get to a point where you can't disprove

your hypothesis anymore. And that process might open some doors that allow you to think of the bigger problem.

YD: That will absolutely open doors. But you have to be willing to listen and to be humble. That is the beauty of some of the other practices that I do, along with other people who spend an entire lifetime trying to live in the present. It is the exact same process that you are doing with your mind.

Think of it this way, you read about someone who makes a discovery or a significant achievement. In your mind, you translate that to "I, too, need to do something that's going to be huge". And now, you have already limited yourself because if you don't get to the huge achievement you imagined, it'll be a problem. And then fear kicks in because the task is so big, and suddenly you're not willing to try.

But everything you imagined about this great achievement you're supposed to accomplish, it's all in your mind. It doesn't exist the way you think it does. All you have to do is just start moving, in any direction! Be curious, ask questions. Forget about this movie you've created in your mind about big achievements, even if you end up writing only two articles. If you do that with joy, then you've already done something good. What's interesting though is that in almost all cases, you will find that when you are genuinely curious, doors will start opening because you will be present to see the opportunities.

KS: That's sounds deceptively easy! How do you simply change the way your mind approaches these problems?

YD: There's a book that I highly recommend: it's called *Altered Traits.* It is a summary of the scientific investigation into what happens to your mind when you do certain types of practices like meditation. There are parts of the brain that have been scientifically proven to be modifiable through these practices. You can teach people to be humble, how to have values, how to be curious, how to be happy. And what's crazy is that we don't do this regularly!

KS: Even though we've moved away from our original topic of lymphatics, this is a fascinating conversation that I feel we need to spend a few more hours on!

YD: (laughing) That sounds good to me actually!

KS: (laughing) Dr. Dori, thank you so much for a wonderful conversation about lymphatics and so much more!





The Ohio State University

COLLEGE OF MEDICINE

Pediatric Cardiologist Noninvasive Cardiac Imaging

The Heart Center at Nationwide Children's Hospital (NCH) seeks a Noninvasive Cardiac Imaging specialist, at any academic rank, to join its growing and dynamic program.

Candidates should be board-certified or eligible in pediatric cardiology, with advanced training and expertise in performing and interpreting echocardiography and/or advanced cardiac imaging (MRI/CT expertise preferred) along with a strong interest in clinical/translational research. Clinical and research leadership opportunities are available, commensurate with the experience of the applicant.

The successful applicant will join our IAC-accredited NCH Noninvasive Cardiac Imaging team which currently includes 11 attending physicians and 20 sonographers, and performs more than 20,000 echocardiographic studies annually, including more than 1300 fetal, transesophageal, intracardiac, intravascular, and 3-D echocardiograms. Our growing Heart Center cardiac MRI/CT program includes 8 attending physicians from Cardiology and Radiology, and performs over 1000 annual studies. Academic productivity is an expectation as is mentoring junior faculty and fellows. The program includes a 4th year Advanced Noninvasive Cardiac Imaging fellowship to complement the core pediatric and combined pediatric-adult cardiology fellowship programs.

The Heart Center embraces a culture of patient safety and quality, transparency, value-based care, public health awareness, excellence in education and engagement in translational/outcomes research. Our program is closely partnered with the Center for Cardiovascular Research at the NCH-Research Institute which provides infrastructure to support the clinical research enterprise. Research opportunities include engaging in basic science research, clinical research, translational research, population based studies, and research-based education or quality improvement initiatives.

The Heart Center is also part of the Congenital Heart Collaborative between the University Rainbow Babies & Children's Hospital (Cleveland, OH) and Nationwide Children's Hospital heart programs which provides additional opportunity for collaborative research.

Named to the Top 10 Honor Roll on U.S. News & World Report's 2021-22 list of "Best Children's Hospitals," Nationwide Children's Hospital is one of America's largest not-for-profit free-standing pediatric health care systems providing unique expertise in pediatric population health, behavioral health, genomics and health equity as the next frontiers in pediatric medicine, leading to best outcomes for the health of the whole child. Integrated clinical and research programs, as well as prioritizing quality and safety, are part of what allows Nationwide Children's to advance its unique model of care. Nationwide Children's has a staff of more than 13,000 that provides state-of-the-art wellness, preventive and rehabilitative care and diagnostic treatment during more than 1.6 million patient visits annually. As home to the Department of Pediatrics of The Ohio State University College of Medicine, Nationwide Children's Hospital is one of the Top 10 National Institutes of Health-funded free-standing pediatric research facilities. More information is available at NationwideChildrens.org.

To learn more about Nationwide Children's or apply for this position visit us at: NationwideChildrens.org/physician-careers

Candidates may submit their curriculum vitae by email to:

John Kovalchin, MD Director, Non-Invasive Imaging John.Kovalchin@NationwideChildrens.org or

Robert Gajarski, MD, MHSA Section Chief, Pediatric Cardiology The Heart Center at Nationwide Children's Hospital <u>Robert.Gajarski@NationwideChildrens.org</u>

The Ohio State University is an equal opportunity employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, disability status, or protected veteran status.

Cuffless Blood Pressure Monitoring – Remote Devices are Changing the Research Landscape

Jiang Li

No one disputes that blood pressure (BP) is one of the critical basic human vital signs, but high blood pressure detection and diagnosis has not significantly changed in decades. The inflatable cuff was invented over 100 years ago, yet it is still the standard basis for measuring blood pressure. The frequency of monitoring is also relatively unchanged; it's still the occasional doctor's office visit.



The Status Quo

The traditional scenario is for patients to have their BP checked in the physician's office or clinic, then perhaps take a few measurements at home and communicate that information back to the clinician. But significant errors and subsequent misdiagnosis can occur. The American Heart Association, <u>ahajournals.org/doi/10.1161/HYP.000000000000087</u>, cites multiple sources of measurement error: patient-related, devicerelated and procedure-related issues.

"White coat hypertension" refers to a condition where patients experience persistent high blood pressure when it is measured in a clinical setting. And the opposite effect, though less frequent, can also occur. A Penn Medicine study, <u>pennmedicine.org/</u><u>news/news-releases/2019/june/people-untreated-white-coathypertension-twice-likely-die-heart-disease</u>, found that people with untreated white coat hypertension are at greater risk and are twice as likely to die from heart disease. Some people who don't have high blood pressure in their daily lives, are prescribed unnecessary medications because of the situational high reading. Others have readings within an acceptable range on the day of the office visit, but have masked hypertension that goes undiagnosed. Either way, the single or occasional point in time reading is not an accurate representation of the patient's real condition resulting in an incorrect baseline for diagnosis.

The Evolution

An obvious solution to white coat hypertension is a more robust, non-invasive measurement method that doe not place undue stress on the patient, yet produces quality results. Ambulatory BP monitoring devices are available and produce accurate systolic and diastolic measurements, but they still use inflatable cuffs which are cumbersome and effectively discourage patients from following through with the protocol and is not practical to wear for an extended time.

With the increased adoption of wearable sensors, other devices are being introduced to continuously monitor BP through new technologies. These include wristbands, mobile phone apps, finger sensors and more. Photoplethysmography (PPG) is used in finger cuff monitors but this vascular unloading technique raises concerns about digital ischemia and isn't practical for frequent use.

There is a relatively new class of BP devices that use optical sensors on a wristband - blood pressure is estimated from the pulse arrival time (PAT) which measures the time for a pulse wave to move between two arterial points. Photoplethysmography (PPG) uses optical sensors to detect blood flow volume change by measuring the amount of light either transmitted or reflected. However, the accuracy of optical sensors is dependent on many factors such as the patient's body mass index (BMI), skin tone, movement, and correct device adherence since exposure to other sources of bright light can affect the precision.

Another new option is an advanced multimodal continuous signal processing patch that leverages electrical ECG and mechanical signals to capture BP. Multiple measurements take the patient's activity level into consideration so the excess "noise" can be filtered out to ensure quality data. In the case of the Vivalink rechargeable wearable ECG patch, a continuous stream of data is wirelessly uploaded to a biometric data platform in the cloud where advanced AI algorithms calculate the BP.

The Potential

Cardiovascular or cardiopulmonary studies strive to attain accurate ongoing measurements without placing an undue burden on patients. And physicians need comprehensive data to improve diagnosis and therapeutics. It is key to obtain contextual data to offer a full perspective on what the patient is doing before and during the BP measurement. With sensors that collect multiple vitals, the provider or researcher can better understand the context. For example, an EEG measurement showing high brain wave activity could indicate stress and affect the BP reading.

REMOTE DEVICES ARE CHANGING THE RESEARCH LANDSCAPE

Myriad physical and functional factors figure into obtaining an accurate measurement. All the elements must work together for optimum performance. Like so many standard-use tools and methods, that cumbersome inflatable BP cuff is not the only game in town anymore. Innovators are designing and implementing technology that will bring about real change for both patients and clinicians. Both the wrist band and the patch are convenient options, but neither is fully verified compared to cuffless BP monitoring - not yet. The point is that progress is being made. Wearable sensors are available for research and development, which is both novel and promising. The concept of measuring blood pressure from a single ECG patch is revolutionary. The remote factor opens the door to test with a diverse population which will be necessary for clinical use and groundbreaking for research. There is still a lot of work to be done, but there are steps proceeding in the right direction.

Jiang Li is founder and CEO of Vivalink. His passion and extensive experience in bringing innovative technology and products into the marketplace positions him as an innovative thought leader in virtual healthcare. An executive with more than two decades of experience across multiple disciplines, including global healthcare IT, medical device, cloud software, and sensor and IoT industries, he is a regular contributor to leading edge media including Forbes and an established industry speaker. Prior to joining VivaLNK, he was responsible for new product and technology development as the VP of engineering at Kovio and Thinfilm Electronics, leading printed electronics companies. Prior to that, he worked at AMD and the joint venture between AMD/Fujitsu, Spansion. As the VP of product engineering at Spansion, Jiang managed the major new product launches at Spansion. Jiang holds 22 US patents, and a PhD degree from the University of Wisconsin-Madison.



CEO of Vivalink jl@vivalink.com vivalink.com



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



Recruitment **Advertising**

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



Subscribe Electronically Free on Home Page

www.CongenitalCardiologyToday.com





Pediatric Cardiologist/Neonatologist

Division of Pediatric Cardiology, Department of Pediatrics University of Utah School of Medicine

This is an excellent opportunity to join a vibrant and collegial academic environment. The Divisions of Pediatric Cardiology and Neonatology at the University of Utah School of Medicine has an immediate opening for a full time, non-invasive Pediatric Cardiologist and Neonatologist with expertise and interest in non-invasive imaging and pulmonary hypertension. Inpatient responsibilities will take place in Primary Children's Hospital Main and Lehi Campuses, and at the University of Utah and Intermountain Medical Center NICUs. The ideal candidate will be capable of managing all aspects of neonatology (including managing ECMO patients) and general pediatric cardiology and bring expertise as a consultant in the cardiac intensive care unit and other intensive and acute care units throughout the hospital. Inpatient work at Primary Children's Hospital main campus is supported by advanced practice providers (NPs and PAs), neonatology and cardiology fellows, and pediatric residents. Outpatient responsibilities are available for the interested candidate in the neurodevelopmental follow up clinic, pulmonary hypertension clinic, and neonatal follow-up clinic. Overnight and weekend call responsibilities are divided among all division faculty in both divisions. Academic productivity in quality improvement, research, teaching, and advocacy is expected and supported.

The Division of Pediatric Cardiology has a very active research program with a strong support infrastructure and supporting team with a total of 7 research coordinators. It has been a core site of the Pediatric Heart Network of the National Institutes of Health (NIH) since its inception and participates in the NPC-QIC and all the major registries including PC4, PAC3, IMPACT, etc. In addition, the Division is a core site for the Scientific Focus Research Network of the American Heart Association (AHA). Numerous opportunities for collaborative research exist within the Division as well as throughout the Department, Medical School and University.

The Division of Neonatology has participated in national randomized clinical trials via the NICHD funded Neonatal Research Network for 12 of the last 17 years, with anticipated continued participation through 2030. The Division has over 15 clinical coordinators spanning 5 NICUs that participate and assist in promoting clinical research in neonates. Preclinical research is strongly supported by the Division, with active basic science labs focused in part on BPD and CDH-associated pulmonary hypertension in a lamb model, and clinical trials assessing treatments for post-op PPHN in infants with CDH. As a high altitude center, our incidence of pulmonary hypertension exceeds the national average.

Qualified candidates must be Board Eligible/Board Certified in Pediatric Cardiology, with expertise and interest in non-invasive imaging and pulmonary hypertension. The selected candidate will receive a faculty appointment in the Department of Pediatrics on the Clinical or Tenure Track at the academic level commensurate with experience and qualifications.

The Department and University offers a competitive salary and an unmatched benefits program, including non-contributory retirement contributions of 20.2% of annual salary that vest immediately. The Department offers a faculty development and mentoring program designed to foster success in translational or basic research, quality improvement engagement, and excellence as educators.

Salt Lake City offers an incredible quality of life with a growing economy, rich cultural scene with ballet, theatre, symphony, opera, live music, museums, outstanding restaurants, and a moderate cost of living. The city is a well-known ski destination and a gateway to the state's renowned landscapes. In addition to its 14 ski resorts, Utah boasts five scenic national parks (with five more within a day's drive), a variety of golf courses allowing for year-round play, hundreds of miles of hiking and biking trails (some leaving from adjacent to the hospital), and numerous other outdoor activities.

Interested individuals can apply for the position at <u>https://utah.peopleadmin.com/postings/139514</u>.

Cover letter and curriculum vitae are required. For additional information about the position, please contact: Antonio Cabrera, M.D., Division Chief, at <u>antonio.cabrera@hsc.utah.edu</u>.

The University of Utah Health (U of U Health) is a patient focused center distinguished by collaboration, excellence, leadership, and respect. The U of U Health values candidates who are committed to fostering and furthering the culture of compassion, collaboration, innovation, accountability, diversity, integrity, quality, and trust that is integral to our mission.

The University of Utah values candidates who have experience working in settings with students, staff, faculty, and patients from diverse backgrounds and possess a strong commitment to improving access to higher education, employment opportunities, and quality healthcare for historically underrepresented groups.

Individuals from historically underrepresented groups, such as minorities, women, qualified persons with disabilities and protected veterans are encouraged to apply. Veterans' preference is extended to qualified applicants, upon request and consistent with University policy and Utah state law. Upon request, reasonable accommodations in the application process will be provided to individuals with disabilities.

The University of Utah is an Affirmative Action/Equal Opportunity employer and does not discriminate based upon race, ethnicity, color, religion, national origin, age, disability, sex, sexual orientation, gender, gender identity, gender expression, pregnancy, pregnancy-related conditions, genetic information, or protected veteran's status. The University does not discriminate on the basis of sex in the education program or activity that it operates, as required by Title IX and 34 CFR part 106. The requirement not to discriminate in education programs or activities extends to admission and employment. Inquiries about the application of Title IX and its regulations may be referred to the Title IX Coordinator, to the Department of Education, Office for Civil Rights, or both.



3D Printed, Bioinspired Heart Valves

Scaffolds Created by Melt Electrowriting Aim to Support New Tissue Formation

Prof. Dr. Petra Mela, Technical University of Munich, Chair of Medical Materials and Implants

Researchers have developed 3D printed artificial heart valves designed to allow a patient's own cells to form new tissue. To form these scaffolds using melt electrowriting – an advanced additive manufacturing technique – the team has created a new fabrication platform that enables them to combine different precise, customized patterns and hence to fine-tune the scaffold's mechanical properties. Their long-term goal is to create implants for children that develop into new tissue and, therefore, last a lifetime.

In the human body, four heart valves ensure that blood flows in the correct direction. It is essential that heart valves open and close properly. To fulfil this function, heart valve tissue is heterogeneous, meaning that heart valves display different biomechanical properties within the same tissue.

A team of researchers working with Petra Mela, Professor of Medical Materials and Implants at the Technical University of Munich (TUM), and Professor Elena De-Juan Pardo from The University of Western Australia, have now, for the first time, imitated this heterogeneous structure using a 3D printing process called melt electrowriting. To do this, they have developed a platform that facilitates printing precise customized patterns and their combination, which enabled them to fine-tune different mechanical properties within the same scaffold.

Melt Electrowriting Enables the Creation of Precise and Customized Fiber Scaffolds

Melt electrowriting is a comparatively new additive manufacturing technology that uses high voltage to create accurate patterns of very thin polymer fibers. A polymer is heated, melted and pushed out of a printing head as a liquid jet to form the fibers.

During this process, a high-voltage electric field is applied, which considerably narrows the

diameter of the polymer jet by accelerating it and pulling it towards a collector. This results in a thin fiber with a diameter typically in the range of five to fifty micrometers. Moreover, the electric field stabilizes the polymer jet, which is important for creating defined, precise patterns.

The "writing" of the fiber jet according to predefined patterns is conducted using a computer-controlled moving collector. Similar to moving a slice of bread below a spoon dripping with honey, the moving platform collects the emerging fiber along a defined pathway. The user specifies this pathway by programming its coordinates.

In order to considerably reduce the programming effort associated with the creation of complex structures for heart valves, the researchers developed a software to easily assign different patterns to different regions of the scaffold by choosing from a library of available patterns. Furthermore, geometrical specifications such as the length, diameter and thickness of the scaffold can easily be adjusted via the graphical interface.

The Heart Valve Scaffolds are Compatible with Cells and Biodegradable

The team used medical grade polycaprolactone (PCL) for 3D printing, which is compatible with cells and biodegradable. The idea is that once the PCL-heart valves are implanted, the patient's own cells will grow on the porous scaffold, as has been the case in first cell culture studies. The cells might then potentially form new tissue, before the PCL-scaffold degrades.

The PCL-scaffold is embedded in an elastinlike material that imitates properties of natural elastin present in real heart valves and provides micro-pores smaller than the pores of the PCL structure. The aim is to leave enough space for the cells to settle, but to seal the valves adequately for blood flow. The engineered valves were tested using a mock flow circulatory system simulating physiological blood pressure and flow. The heart valves opened and closed correctly under the examined conditions.

Nanoparticles Allow for Visualization Using MRI

The PCL-material was further evolved and evaluated together with Franz Schilling, Professor of Biomedical Magnetic Resonance, and Sonja Berensmeier, Professor of Bioseparation Engineering at TUM. By modifying PCL with ultrasmall superparamagnetic iron oxide nanoparticles, the researchers could visualize the scaffolds using magnetic resonance imaging (MRI). The modified material remains printable and compatible with cells. This might facilitate the translation of the technology to the clinics, as the scaffolds can thus be monitored upon implantation.

"Our goal is to engineer bioinspired heart valves that support the formation of new functional tissue in patients. Children would especially benefit from such a solution, as current heart valves do not grow with the patient and, therefore, have to be replaced over the years in multiple surgeries. Our heart valves, in contrast, mimic the complexity of native heart valves and are designed to let a patient's own cells infiltrate the scaffold", says Petra Mela.

The next step on the way to the clinic will be pre-clinical studies in animal models. The team also works on further improving the technology and developing new biomaterials.

NEONATOLOGY TODAY Peer Reviewed Research, News and Information in Neonatal and Perinatal Medicine



Brenner Children's

Medical Director, Pediatric CVICU

The Congenital Heart Center at Levine Children's Hospital (LCH), in association with the Wake Forest University School of Medicine and Atrium Health Wake Forest Baptist (AHWFB), is accepting applications for a Cardiac Intensivist academic faculty position at the rank of Associate Professor or Professor (non-tenure, clinical track) to serve as Medical Director of the Cardiac Intensive Care Unit at the Brenner Children's Hospital campus in Winston-Salem, NC.

For the Cardiac Intensive Care Unit, this medical director will work with the Heart Center Co-Directors to develop, coordinate, and integrate a team approach, unifying cardiovascular surgeons, intensivists, anesthesiologists, cardiologists, and advanced practice providers across both campuses. Additional responsibilities include recruitment, training, and development of new CICU staff as well as fostering academic productivity and professional development of its faculty and trainees and continue our participation in national registries such as the Pediatric Cardiac Critical Care Consortium (PC4).

In early 2022, Atrium Health announced the formation of a Joint Heart Program, unifying pediatric heart programs at Levine Children's Hospital, Charlotte, and Brenner Children's Hospital, Winston-Salem. Our comprehensive services include cardiac imaging, diagnostic and interventional catheterization, invasive electrophysiology, dedicated cardiovascular intensive care staff, and regional referral programs in heart failure/transplantation, adult congenital heart disease, and fetal echocardiography. We have one of the most comprehensive Cardiac Neurodevelopment programs in the Southeast, providing a multitude of specialty services to our congenital heart patients in the same office suite. Across two campuses, the team currently includes 18 cardiologists, 3 congenital heart surgeons, 5 cardiac intensivists, 5 pediatric cardiac anesthesiologists, 2 pediatric cardiac radiologists, 22 APPs (includes 3 surgical ACPs), 21 sonographers, 6 nurse navigators, and 9 dedicated RNs.

Wake Forest University School of Medicine, the academic core of Atrium Health Enterprise, is the medical education and research component of Atrium Health Wake Forest Baptist. The academic health system is comprised of an 885-bed tertiary-care hospital in Winston-Salem – that includes Brenner Children's Hospital, five community hospitals, 300 plus primary and specialty care locations, and more than 2,700 physicians. Brenner Children's Hospital is the home of a 10-bed PICU with nine pediatric intensivists, 2 APP's, an ECMO center and active participation in ELSO and VPS.

Located in the Piedmont Triad region of North Carolina, Winston-Salem is the state's fifth largest city and named one of "The South's Best Cities on the Rise 2021" by Southern Living. It is also the home of Innovation Quarter, a culturally diverse and creatively rich community focused on research, business and education in biomedical science, information technology, digital media, clinical services, and advanced materials.

Requirements: MD or equivalent, the ideal candidate would be board certified in pediatric critical care, pediatric cardiology, or equivalent appropriate subspecialty with additional training or work experience in pediatric cardiac critical care OR board certified in both pediatric critical care medicine and pediatric cardiology. This applicant should possess leadership experience and a rank of at least Associate Professor and embrace the tripartite missions (clinical, research and education) of Wake Forest University School of Medicine.

Applicants should submit a cover letter and curriculum vitae.

Contact Information: Jackie Aubert Sr. HR Consultant, Talent Acquisition jaubert@wakehealth.edu

Atrium Health and the Wake Forest University School of Medicine are Affirmative Action and Equal Opportunity Employers with a strong commitment to achieving diversity among its faculty and staff.

US to See a Staggering Number of Cardiomyopathy Cases by 2031 According to GlobalData

- 2.3 million cardiomyopathy cases expected in the US by 2031, representing 83% of total cases in the 7MM (The US, Japan, France, Germany, Italy, Spain and the UK)
- Lack of epidemiology data and poor lifestyle choices contributing to US numbers
- US 'acquired cardiomyopathy' cases are double that of 'inherited cardiomyopathies', significantly higher than any other 7MM country







 \bigcirc % of population with cardiomyopathy in 7MM, 2021 and 2031

FIGURE 2



Research by GlobalData has highlighted the startling difference between the forecast number of diagnosed cardiomyopathy cases in the US, compared to other countries in the 7MM*.

The leading data and analytics company's report, 'Cardiomyopathies Epidemiology Analysis and Forecast, 2021-2031', notes that the US will have the highest number of diagnosed prevalent cases of cardiomyopathies in 2031, at over 2.3 million. This represents 83% of the total cases in the 7MM**, with the next closest countries being Germany (5.7%) and Spain (2.9%).

Cardiomyopathy is a general term for a collection of diseases that affect the heart muscle. The walls of the heart are thickened or stretched, reducing its ability to pump blood around the body and can lead to heart attack. Risk factors range from family history to diabetes, alcohol consumption, obesity and high blood pressure.

Walter Gabriel, MPH, Epidemiologist at GlobalData, explains:

"Even if we compensate for the differences in population size, as in **Figure 2**, the US is still miles ahead when it comes to total cardiomyopathy cases. In a way, this is no surprise. The number of Type II diabetes cases in the US is expected to annually rise by 1.8% to over 20.8 million cases by 2028, while high blood pressure is also expected to annually rise by 0.95%, to over 65 million diagnosed cases in 2027. These are key risk factors for cardiomyopathy. While it is not new to say that the US has challenges with obesity, visuals like this can often be useful to highlight the impact that those with unhealthy lifestyles are having on the healthcare industry."

Another contributing factor to the US's high numbers is the lack of robust epidemiological data. The main forms of cardiomyopathy are dilated cardiomyopathy (DCM), hypertrophic cardiomyopathy (HCM), restrictive cardiomyopathy (RCM), and arrhythmogenic right ventricular cardiomyopathy (ARCM).

Gabriel continues: "When forming our report, we found that epidemiological data pertaining to these specific forms of cardiomyopathy were incomplete for many markets; therefore, we had to assume that the ratio of cardiomyopathy subtypes were similar between markets with missing data. This resulted in the US having many additional cases of cardiomyopathy due to its high prevalence of HCM. The lack of market specific data make it difficult for countries to predict the burden of

MEDICAL NEWS

CAREER OPPORTUNITY

cardiomyopathies, and, thus, our report helps to fill a critical knowledge gap."

Another metric, the split between familial (inherited) and acquired cardiomyopathies (where the patient develops cardiomyopathy as a result of another condition or factor), also places the US figures in stark contrast to nearly every other country in the 7MM. The US proportion of acquired cardiomyopathies is double that of inherited, whereas in the rest of the 7MM is broadly an even split.

Gabriel concludes: "The high proportion of acquired cases of cardiomyopathy in the US may be attributed to a high number of individuals engaging in lifestyle factors that place them at a higher risk of developing cardiomyopathy. These factors include but are not limited to diet, drinking alcohol, and a lack of exercise. On an individual basis, cardiomyopathy increases the risk of sudden cardiac death, and, thus, it is important for individuals with these risk factors to be assessed for potential cardiovascular complications frequently."

* 7MM: The US, Japan and the 5EU (France, Germany, Italy, Spain and the UK)

** Research conducted on the 7MM - dilated, hypertrophic, restrictive, or arrhythmogenic cardiomyopathy types included *** 5EU: France, Germany, Italy, Spain and the UK



MEETING CALENDAR

OCTOBER

27-29

CATCH 2022: Caring for Adults and Teens with Congenital Heart Disease Kapolei, Hawaii, USA https://web.cvent.com/event/ba10cbbd-9a74-4ce8-b81f-e1796fb5ca66/summary

NOVEMBER/DECEMBER

27-01

RSNA 2022 Chicago, Illinois, USA https://www.rsna.org/annual-meeting





Pediatric Cardiology Faculty Opportunity

The Department of Pediatrics at Rainbow Babies & Children's Hospital (RBC) and The Congenital Heart Collaborative (TCHC) are conducting a national search to identify candidates at any academic rank, including 2023 fellows for two additional Pediatric Cardiologists to join their robust and expanding program. While the primary focus of these positions is ambulatory care, opportunities exist for noninvasive imaging and inpatient service based on the interests of the candidates.

Opportunity Highlights:

- Opportunities currently include serving as primary representative with MetroHealth, an existing partnership and innovative affiliation between RBC and the MetroHealth System to provide world class pediatric cardiology care in downtown Cleveland, with options to serve additional clinics at the main RBC campus and other ambulatory locations across Northeast Ohio.
- Alternatively, opportunity exists to exclusively provide ambulatory care at main RBC campus and other ambulatory locations.
- The RBC Heart Center provides comprehensive services across all cardiac subspecialties and includes 21 faculty (12 cardiologists, 5 cardiac intensivists, 2 cardiothoracic surgeons, and 2 cardiac anesthesiologists) along with a full complement of interdisciplinary team members.
- The RBC Heart Center and Nationwide Children's Hospital Heart Center in Columbus, OH have partnered to form The Congenital Heart Collaborative (TCHC). 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 served while equally embracing a scholarly and educational mission.
- RBC Heart Center has an ACGME accredited Pediatric Cardiology fellowship with 2 fellows per year.
- The facilities at the RBC Heart Center include a recently opened, state-of-the-art Interventional Cath/EP/Hybrid OR suite and a beautiful, dedicated cardiac stepdown unit. Planning is underway for a new state-of-the-art Pediatric Cardiac Intensive Care Unit that will be immediately adjacent to the Hybrid Cath/EP suites and stepdown unit with plans for opening in 2023.

For more details about this opportunity, please contact Karis Beasley at <u>karis@careerphysician.com</u>

University Hospitals is an AA/EOE/ADA employer committed to excellence through diversity.



CORPORATE OFFICE

PO Box 52316 Sarasota, FL 34232 USA

CORPORATE TEAM

PUBLISHER & EDITOR-IN-CHIEF Kate Baldwin kate.f.baldwin@gmail.com

FOUNDER & SENIOR EDITOR Tony Carlson tcarlsonmd@gmail.com CO-FOUNDER & MEDICAL EDITOR John W. Moore, MD, MPH jwmmoore1950@gmail.com

> STAFF EDITOR & WRITER Virginia Dematatis

EDITOR-IN-CHIEF EMERITUS Richard Koulbanis STAFF EDITOR Loraine Watts

EDITORIAL BOARD

Aimee K. Armstrong, MD Jacek Bialkowski, MD Anthony C. Chang, MD, MBA Howaida El-Said, MD, PhD Ziyad M. Hijazi, MD, MPH John Lamberti, MD Tarek S. Momenah, MBBS, DCH John W. Moore, MD, MPH Shakeel A. Qureshi, MD P. Syamasundar Rao, MD Carlos E. Ruiz, MD, PhD Hideshi Tomita, MD Gil Wernovsky, MD

OFFICIAL NEWS & INFORMATION PARTNER OF



Pediatric and Congenital Interventional Cardiovascular Society

Statements or opinions expressed in Congenital Cardiology Today reflect the views of the authors and sponsors and are not necessarily the views of Congenital Cardiology Today. © 2022 by Congenital Cardiology Today ISSN 1554-7787 print. ISSN 1554-0499 electronic. Published monthly. All rights reserved.