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A Pediatric Case of Wide Complex Tachycardia

Kavitha Arulmozhi, MD; Bianca Castellanos, MD; Scott Ceresnak, MD; Lerraughn Morgan, DO

Introduction

Tachycardia can be classified into narrow or wide complex based on the width of the QRS complex. In the adult population, rapid ventricular activation can result in a narrow QRS complex (<120 ms), while abnormally slow ventricular activation can result in a wide QRS complex (>120 ms).^{1,2} In this older population, a Wide Complex Tachycardia (WCT) is most commonly attributed to ventricular tachycardia, but the differential diagnosis can extend to different forms of Supraventricular Tachycardia (SVT), although to a lesser degree.¹

In the pediatric population, the normal QRS width and the normal heart rate vary based on age.³ There is a direct relationship between QRS width and age, so it is important to keep these in mind when evaluating wide complex tachycardia in pediatric patients.

The differential diagnosis of WCT in pediatrics includes: SVT with aberrancy, pre-excited tachycardia, ventricular tachycardia, electrolyte abnormalities, drug ingestion or myocardial ischemia. SVT is the second most common type of tachycardia in pediatric patients with an estimated incidence between one in 250 and one in 1000 patients, whereas ventricular tachycardia (VT) occurs less commonly with incidence rates between one and eight per 100,000 patients.⁵ SVTs can be further classified into Atrioventricular Nodal Reentry Tachycardia (AVNRT), Atrioventricular Reentrant Tachycardia (AVRT), atrial flutter, or Ectopic Atrial Tachycardia (EAT).⁶

In this report, we present a case of a symptomatic teenage female found to have a WCT. She was found to have AVRT from a concealed, right-sided accessory pathway and AVNRT on electrophysiology study, which required radiofrequency ablation and cryoablation, respectively. This case elucidates the importance of identification, expert consultation, and management for aberrant SVT.

Case

History: A 15-year-old female with iron deficiency anemia, and dysfunctional uterine bleeding presented for acute onset palpitations while swimming. Associated symptoms included chest pain, shortness of breath, dizziness, headache, and nausea. Her smartwatch reported an abnormally high heart rate in the 200 bpm range. On arrival to the Emergency Department, pulse was 220 bpm. An electrocardiogram showed a WCT, left bundle branch block, and a superiorly-oriented QRS complex (**Figure 1**). Cardiac exam was normal except for tachycardia. Troponin I and brain natriuretic peptide were elevated at 1.4 ng/mL and 134.2 pg/mL, respectively. Family history was non-contributory. Following a saline bolus, heart rate decreased to 107 bpm and patient spontaneously converted to sinus rhythm (**Figure 2**).

Hospital Course: The patient was admitted to the Pediatric ICU for observation and initiation of atenolol 25 mg twice daily. The troponin levels normalized. Baseline echocardiogram was

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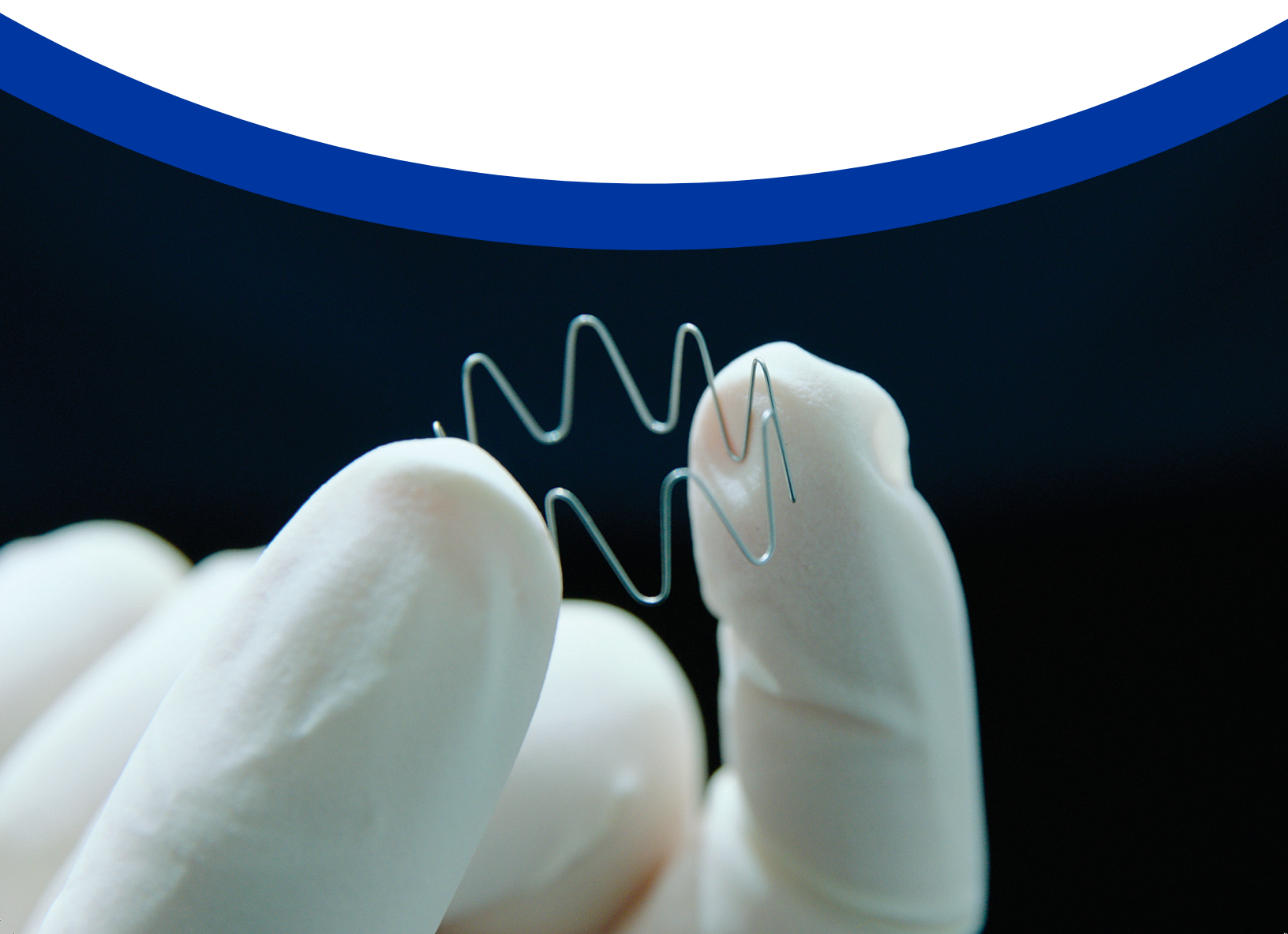
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Delivery catheter system (DCS): This device was designed for single use only. Do not reuse, reprocess, or resterilize the DCS. Reuse, reprocessing, or resterilization may compromise the structural integrity of the device and/or create a risk of contamination of the device, which could result in patient injury, illness, or death. Do not reuse or resterilize the DCS. If resistance is met, do not advance the guidewire, DCS, or any other component without first determining the cause and taking remedial action. Do not remove the guidewire from the DCS at any time during the procedure.

Precautions

General: Clinical long-term durability has not been established for the Harmony TPV. Evaluate the TPV performance as needed during patient follow-up. The safety and effectiveness of Harmony TPV implantation in patients with pre-existing prosthetic heart valve or prosthetic ring in any position has not been demonstrated. The Harmony TPV system has not been studied in female patients of child-bearing potential with positive pregnancy.

Before use: Exposure to glutaraldehyde may cause irritation of the skin, eyes, nose, and throat. Avoid prolonged or repeated exposure to the chemical vapor. Use only with adequate ventilation. If skin contact occurs, immediately flush the affected area with water (for a minimum of 15 minutes) and seek medical attention immediately. The TPV and the glutaraldehyde storage solution are sterile. The outside of the TPV container is nonsterile and must not be placed in the sterile field. The TPV and DCS should be used only in a sterile catheterization laboratory (cath lab) environment. Ensure that sterile technique is used at all times. Strictly follow the TPV rinsing procedure. For TPV 25: Ensure that all green sutures have been removed from the attachment suture loops on the TPV before loading onto the DCS. Prevent contamination of the TPV, its storage solution, and the DCS with glove

powder. Verify the orientation of the TPV before loading it onto the DCS. The inflow end of the TPV with attachment suture loops must be loaded first. Do not place excessive pressure on the TPV during loading. Inspect the sealed DCS packaging before opening. If the seal is broken or the packaging has been damaged, sterility cannot be assured. Proper functioning of the DCS depends on its integrity. Use caution when handling the DCS. Damage may result from kinking, stretching, or forceful wiping of the DCS. This DCS is not recommended to be used for pressure measurement or delivery of fluids. Carefully flush the DCS and maintain tight DCS connections to avoid the introduction of air bubbles.

During use: The TPV segment is rigid and may make navigation through vessels difficult. Do not advance any portion of the DCS under resistance. Identify the cause of resistance using fluoroscopy and take appropriate action to remedy the problem before continuing to advance the DCS. Careful management of the guidewire is recommended to avoid dislodgement of the TPV during DCS removal. Once deployment is initiated, retrieval of the TPV from the patient is not recommended. Retrieval of a partially deployed valve may cause mechanical failure of the delivery catheter system or may cause injury to the patient. Refer to the section below for a list of potential adverse events associated with Harmony TPV implantation. During deployment, the DCS can be advanced or withdrawn prior to the outflow struts protruding from the capsule. Once the TPV struts contact the anatomy during deployment, it is not recommended to reposition the device. Advancing the catheter forward once the TPV struts make contact with the anatomy may lead to an undesired deployment or may cause damage to or failure of the TPV and injury to the patient. Refer to the section below for a list of potential adverse events associated with the Harmony TPV implantation. Physicians should use judgment when considering repositioning of the TPV (for example, using a snare or forceps) once deployment is complete. Repositioning the bioprosthesis is not recommended, except in cases where imminent serious harm or death is possible (for example, occlusion of the main, left, or right pulmonary artery). Repositioning of a deployed valve may cause damage to or failure of the TPV and injury to the patient. Refer to the section below for a list of potential adverse events associated with the Harmony TPV implantation. Ensure the capsule is closed before DCS removal. If increased resistance is encountered when removing the DCS through the introducer sheath, do not force passage. Increased resistance may indicate a problem and forced passage may result in damage to the device and harm to the patient. If the cause of resistance cannot be determined or corrected, remove the DCS and introducer sheath as a single unit over the guidewire, and inspect the DCS and confirm that it is complete. If there is a risk of coronary artery compression, assess the risk and take the necessary precautions. Endocarditis is a potential adverse event associated with all bioprosthetic valves. Patients should make their healthcare providers aware that they have a bioprosthetic valve before any procedure. Post-procedure, administer appropriate antibiotic prophylaxis as needed for patients at risk for prosthetic valve infection and endocarditis. Prophylactic antibiotic therapy is recommended for patients receiving a TPV before undergoing dental procedures. Post-procedure, administer anticoagulation and/or antiplatelet therapy per physician/clinical judgment and/or institutional protocol. Excessive contrast media may cause renal failure. Preprocedure, measure the patient's creatinine level. During the procedure, monitor contrast media usage. Conduct the procedure under fluoroscopy. Fluoroscopic procedures are associated with the risk of radiation damage to the skin, which may be painful, disfiguring, and long term.

Potential Adverse Events

Potential risks associated with the implantation of the Harmony TPV may include, but are not limited to, the following: • death • valve dysfunction • tissue deterioration • hematoma • heart failure • cerebrovascular incident • perforation • rupture of the right ventricular outflow tract (RVOT) • compression of the aortic root • compression of the coronary arteries • sepsis • pseudoaneurysm • erosion • stent fracture • arrhythmias • device embolization or migration • pulmonary embolism • occlusion of a pulmonary artery • laceration or rupture of blood vessels • device misorientation or misplacement • valve deterioration • regurgitation through an incompetent valve • physical or chemical implant deterioration • paravalvular leak • valve dysfunction leading to hemodynamic compromise • residual or increasing transvalvular gradients • progressive stenosis and obstruction of the implant • hemorrhage • endocarditis • thromboembolism • thrombosis • thrombus • intrinsic and extrinsic calcification • bleeding • bleeding diathesis due to anticoagulant use • fever • pain at the catheterization site • allergic reaction to contrast agents • infection • progressive pulmonary hypertension • progressive neointimal thickening and peeling • leaflet thickening • hemolysis. General surgical risks applicable to transcatheter pulmonary valve implantation: • abnormal lab values (including electrolyte imbalance and elevated creatinine) • allergic reaction to antiplatelet agents, contrast medium, or anesthesia • exposure to radiation through fluoroscopy and angiography • permanent disability.

Please reference the Harmony TPV system instructions for use for more information regarding indications, warnings, precautions, and potential adverse events.

CAUTION: Federal law (USA) restricts these devices to the sale by or on the order of a physician.

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normal. There were no recurrences of SVT. Upon discharge, a 30-day event monitor was placed. Patient reported no palpitations or recurrences of SVT. In consultation with pediatric electrophysiology, the patient elected to undergo an invasive electrophysiology study with possible ablation.

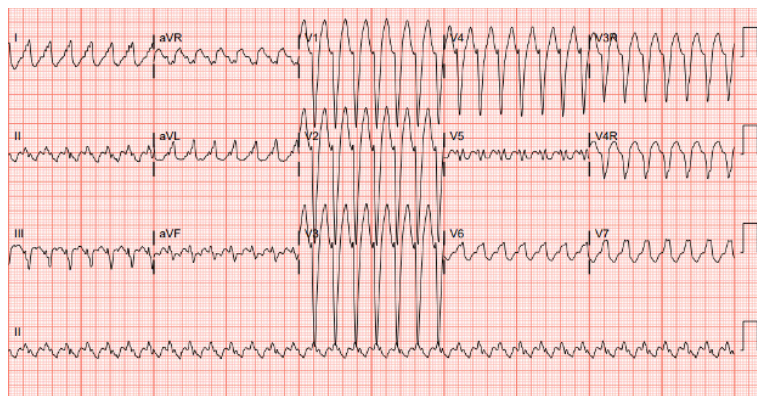


FIGURE 1 Electrocardiogram on presentation in ED

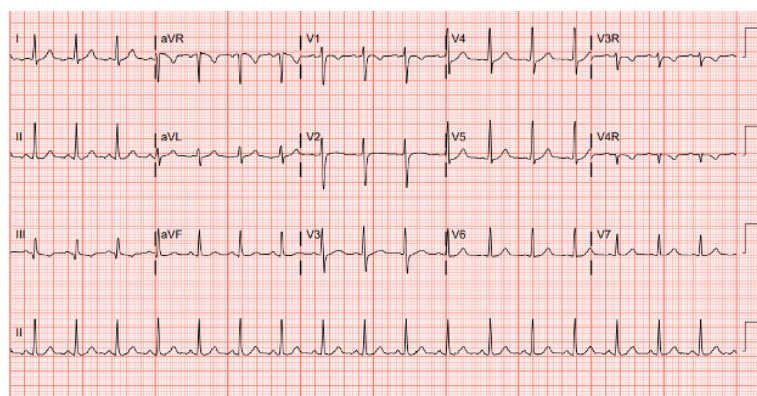


FIGURE 2 Electrocardiogram after spontaneous conversion to sinus rhythm in ED, no pre-excitation evident

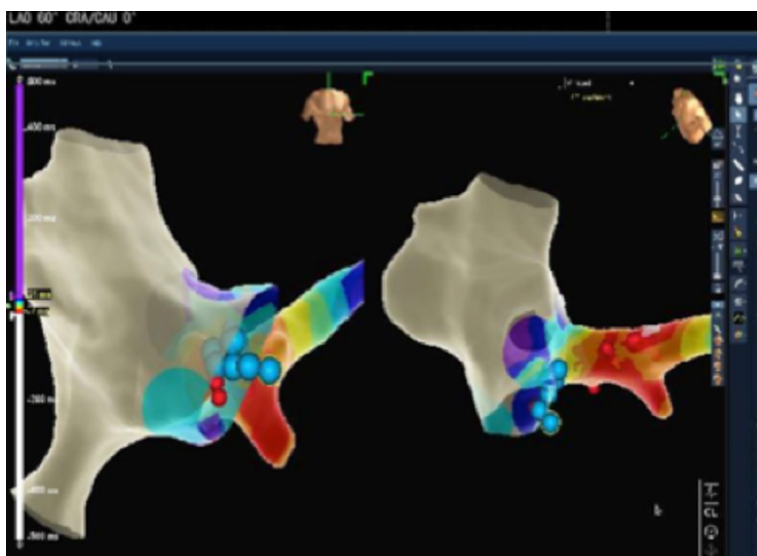


IMAGE 1 Activation patterns with V-pacing to help localize the accessory pathway. Blue dots were used for cryoablation. Red dots were used for RF ablation.

Post Procedural Results: Intraoperative findings were significant for two distinct substrates causing Orthodromic Reentrant Tachycardia (ORT) (**Image 1**). The first substrate was an AVRT from a concealed, right-sided accessory pathway, which was amenable to radiofrequency ablation. The second substrate was typical AVNRT, which underwent successful cryoablation. The patient was reporting occasional palpitations afterwards, but repeat electrocardiogram and event monitor were normal, so annual follow-up was recommended.

Discussion

Palpitations are a nonspecific finding that can be secondary to cardiac conditions, such as arrhythmia, myocarditis, pacemaker malfunctions, Postural Orthostatic Tachycardia Syndrome or cardiomyopathies.⁷ Non-cardiac conditions such as hypoglycemia, pheochromocytoma, fever, anemia, exercise, hyperthyroidism, panic attack or drug ingestion can also cause palpitations.⁷ While our patient was anemic, it was a previously known diagnosis, and the sudden onset of her symptoms did not support this as the causative diagnosis.

The differential diagnosis for pediatric WCT is broad including: rhythm abnormalities such as SVT with aberrancy, VT, genetic causes such as long QT syndrome or Brugada syndrome, cardiomyopathies, acquired conditions such as infectious myocarditis, and electrolyte abnormalities.⁴ In the adolescent population, ingestion of stimulants such as amphetamines, cocaine, excess caffeine, and nicotine can also be potential contributors.¹

The EKG in our case was most consistent with ORT with aberrant conduction, atriofascicular tachycardia, or aberrant conduction of atrial tachyarrhythmia. In a typical SVT, conduction through the AV node is rapid, resulting in a narrow complex tachycardia. However, in SVT with aberrancy, the conduction can be delayed due to abnormalities in the bundle branches or accessory AV conduction, leading to a wide QRS complex.³ In atriofascicular tachycardia, the conduction pathway starts from the right atrium and progresses through an accessory connection (separate from the AV node and bundle of His) into a ventricular fascicle, also leading to a wide QRS complex.⁸ Differentiating the etiology of WCT due to VT or SVT can be difficult on EKG, often leading to misdiagnosis.⁹ In current practice, electrophysiology testing provides an accurate means for diagnosis and management as seen in our case.

Literature of WCT secondary to SVT in the pediatric population is limited. Hopkins et al. described a case of a nine-day-old girl with symptomatic COVID-19 infection who was found to have a WCT due to SVT with aberrancy.¹⁰ She was treated with oral propranolol without recurrence of SVT during periodic follow-up. The utilization of smartwatches in recording cardiac rhythm and rate data when patients are experiencing symptoms have also shown to be beneficial. A 16-year-old female with three years of palpitations recorded a symptomatic episode on a smartwatch, later found to be due to likely AVNRT.¹¹ She was monitored with a Holter monitor for two weeks, but was asymptomatic and no arrhythmia was detected. She subsequently had an electrophysiology study performed and underwent ablation for AVNRT, without recurrence of symptoms at a four month follow-up. While there are limitations to smartwatches, they can serve as a preliminary tool for early identification of arrhythmias prompting



the need for a formal workup and timely intervention as seen in the literature and in our case.

Wide complex tachycardias are commonly of ventricular origin in adults, but SVT with aberrancy is a more common etiology in the pediatric population. While conditions such as Wolff-Parkinson-White Syndrome are known to have predisposition to ventricular fibrillation, other etiologies of SVT, such as AVNRT, EAT, and AVRT have a lower risk to develop ventricular tachyarrhythmia.^{4,12} Our case demonstrates the importance of identifying the etiology of a WCT. Healthcare practitioners should take into account the entire clinical scenario in order to prevent misdiagnosis and provide appropriate management of SVT with aberrancy.

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Insights on CSI America 2023 – An Interview with Key CSI Faculty and Leaders in the Field

Jenny E. Zablah, MD

Interviewees: Zahid Amin, MD; Gareth Morgan, MD; Sir Shakeel A. Qureshi, MD; John Thomson, MD

CSI Congress (Congenital, Structural and Valvular Interventions) is one of many educational and networking meetings that are available for interventional cardiologists around the world. CSI started off in 1996 as a simple workshop for a particular ASD occluder, with only 77 attendees; it was a small meeting compared to well over 1500 participants who now congregate at CSI Frankfurt every year. Fast forward 20 years and the program for CSI Frankfurt now includes over 40 scheduled live cases transmitted from cardiovascular centers all over the world. Over the last decade, CSI has branched out to other locations worldwide, including Asia-Pacific, Middle East, Africa and most recently the United States.

This month, Dr. Jenny E. Zablah, Associate Professor of Pediatrics at the University of Colorado and Congenital Interventional Cardiologist at Children’s Hospital Colorado, caught up with some of the key faculty of CSI America during the recent 8th World Congress of Pediatric Cardiology and Cardiac Surgery. Together with Sir Shak Qureshi, Dr. Zahid Amin, Dr. John Thomson, and Dr. Gareth Morgan; Dr. Zablah provides a glimpse of the workings behind putting on such a program – as well as the extraordinary camaraderie amongst the CSI family, which makes CSI more than just a meeting. With a track record of providing medical education in the field for over 26 years, this year’s United States edition in Orlando is set to stand apart from other meetings by offering live animal training as part of the scientific program.



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Jenny Zablah (JZ): Shak, you started CSI over 25 years ago. What motivated you to take the lead in medical education with this conference and what keeps you going after so many years?

Sir Shakeel Qureshi (SQ): After I finished my training, I was attending meetings and I noticed that these meetings tended to be not as stimulating as I had hoped. A lot of the things that were discussed went way over my head and probably other new consultants felt the same.

After discussions with Horst Sievert, we decided to hold a meeting with a small number of interventionists back in 1996. There were only about 40 to 50 people that attended. We showed cases, and it was excellent for teaching, and that then led to Horst Sievert and Neil Wilson telling me: “Let’s do another one.” And so, we started that.

Neil and I liked to quiz people, put them on the spot, especially the experts, and get them involved in some basic questions and answers, and then get attendees involved as well. And so that’s how we did it. And gradually that became the sort of footprint for CSI.

JZ: Shak, what motivates you to go and do this type of conference not just in Frankfurt, but extend it worldwide and especially America.

SQ: When we were doing CSI Frankfurt, during my travels around the world, people would say “Well, I wish I’d attended, but I couldn’t” - either afford to, or get funding or get sponsorship, and there was a lot of demand in different regions. Along with Neil, Horst and Mario we thought, what better way to spread that education than take it locally, so a bigger portion

of local doctors of all levels and nurses can attend. A lot of that relies on friendship. So, that’s how we went to Bangkok, Tokyo. We did Ethiopia, Uganda, Kenya, and Tanzania for CSI Africa. This way people local to those continents and regions can attend without vast expenses. And this just disperses or spreads the education and makes it accessible to everybody.

JZ: Pretty impressive journey Shak. Gareth, you, and I represent different stages of the younger generation that Shak is trying to educate. From your perspective, what do physicians get out of attending conferences these days? In theory, we can just learn everything online. So, what can they get from going in person to these CSI meetings?

Gareth Morgan (GM): There are a lot of resources available online and CSI has really exploited the online platforms, using webinars and other educational tools. That’s been a good adjunct, particularly as we struggled through the COVID pandemic.

We’re currently at the World Congress in Washington, D.C. and I’ve interacted with and seen so many people from earlier parts of my career that I haven’t seen in so long. I really don’t think that online virtual meetings will ever replace in-person meetings. It’s an absolute privilege and a delight to be able to physically interact with people that I respect and admire, and as well as having trainees who want to learn from us and other faculty from around the world here. In-person just provides a whole other layer of education and substance that you cannot achieve in an online meeting.





Jenny E. Zablah, MD



Zahid Amin, MD



Gareth Morgan, MD



Sir Shakeel A. Qureshi, MD



John Thomson, MD

JZ: Well said, and do you think that having the CSI hands-on training, on top of those available opportunities to hold face to face discussions, is valuable for trainees and junior faculty?

GM: The feedback from the trainees and the junior faculty is that the hands-on stuff that we do, whether it's an anatomic assessment, or whether it's use of devices or simulators, provides an enormous boost for them. So, I think the hands-on training needs to stay a big part of this and needs to be integrated into our meetings.

JZ: John, a couple of years ago there was a lot of speculation about how education in general, not just in the medical field, would change completely to virtual. Truth is, we are doing in-person conferences, but now can benefit from online educational meetings in addition. Where do you think the future in medical education lies with this?

John Thomson (JT): Well, I think Zoom and Teams, and so on, were life savers during COVID. They allowed us to continue with some elements of what we were doing before, but frankly, they're not the same. A huge part of meetings and conferences, and medical education is networking. A huge part of education is relatively informal talks with colleagues. Personally, I'm very glad that we're back to meetings; it feels natural and completely appropriate, and whilst I don't underestimate the value of Zoom and virtual meetings in the overall structure, I don't think they will replace meetings, and I don't think that they ever will be anything other than parts of the education portfolio.

JZ: Great points. Now more specifically speaking about regional versions of CSI. Zahid, Orlando now opens its doors to CSI America this year in one of its more special meetings. What makes it different?

Zahid Amin (ZA): CSI America started in San Francisco for a couple of years. And then moved to Denver where Gareth and you knocked it out of the park.

I think, CSI coming to Orlando, has several benefits. One, we will attract not only physicians practicing in the U.S., but also from Central and South America due to proximity. And second, we have a very special venue called Nicholson Center, which is a research facility with animal labs. So, we thought, based upon some successes that we have had with the hands-on workshops, animal training workshop as an addition to the congress would be a huge advantage and put a positive spin on CSI America meeting.

The program is made in such a way that there will be didactic sessions, but at the same time you'll also have hands-on live animal training sessions separately covering congenital and structural interventions. I know it's a big task, but I think it is a big deal and it makes this year's CSI America better and different.

JZ: So, this seems to be an upgrade from the heart dissection workshop that you have in CSI Frankfurt for years now. I know that Gareth has collaborated on your cause for that, too. How do you think such training sessions benefit attendees? What's the feedback you've got throughout all these years, and your experience with it?

ZA: So, it's interesting. We started the hands-on dissection workshops at CSI six years ago and when we did the first session, it was so well received that I was asked to do another session the next day. At CSI America this year we will do live animal workshops, which is more challenging. This means that the trainee will do a beating heart case in animal, This will give the trainee a real time, real cath lab experience. The trainee will be able to confer with world experts and learn from them.

JZ: On that note, Shak. I think this is the first time I have heard of animal training being offered in the context of a medical conference. How do you combine the scientific sessions and these trainings? What do you envision?

SQ: Animal training has some benefits where you remember techniques or issues that really influence the rest of your career. We've got lots of sessions really running parallel to the training; we have congenital and adult interventional. So, the animal training is a part of that. CSI really offers a wide variety of education from live cases, from lectures, from animal training and Cathlab Cafe. There is really something there for all different specialties and people can attend whatever session they want.



JZ: I think one question that a lot of the more junior people that go to CSI America is how to get involved with CSI. John, how did you first get involved?

JT: A big part of it is networking, and the reality is that all of us, at one stage were young learning cardiologists, and we relied on older people like Shak, Neil Wilson, Zahid, others to help us. And I think that's ultimately how I got involved - by being enthusiastic, being available and listening carefully to the advice that I was given, and I don't think that would have happened if all of that was occurring on Zoom. I think this is something that occurs naturally when you're in a meeting environment.

GM: Yeah, the "getting involved thing" is something that I think a lot of young cardiologists are anxious about. It is important that we encourage younger people to get involved. In my case, it was through just being



THE UNIVERSITY
of NORTH CAROLINA
at CHAPEL HILL

Congenital Heart Surgeon

Primary Purpose of Organizational Unit

The UNC School of Medicine has a rich tradition of excellence and care. Our mission is to improve the health and wellbeing of North Carolinians, and others whom we serve. We accomplish this by providing leadership and excellence in the interrelated areas of patient care, education, and research. We strive to promote faculty, staff, and learner development in a diverse, respectful environment where our colleagues demonstrate professionalism, enhance learning, and create personal and professional sustainability. We optimize our partnership with the UNC Health System through close collaboration and commitment to service.

OUR VISION

Our vision is to be the nation's leading public school of medicine. We are ranked 2nd in primary care education among all US schools of medicine and 5th among public peers in NIH research funding. Our Allied Health Department is home to five top-ranked divisions, and we are home to 18 top-ranked clinical and basic science departments in NIH research funding.

OUR MISSION

Our mission is to improve the health and well-being of North Carolinians and others whom we serve. We accomplish this by providing leadership and excellence in the interrelated areas of patient care, education, and research.

Patient Care: We will promote health and provide superb clinical care while maintaining our strong tradition of reaching underserved populations and reducing health disparities across North Carolina and beyond.

Education: We will prepare tomorrow's health care professionals and biomedical researchers by facilitating learning within innovative curricula and team-oriented interprofessional education. We will cultivate outstanding teaching and research faculty, and we will recruit outstanding students and trainees from highly diverse backgrounds to create a socially responsible, highly skilled workforce.

Research: We will develop and support a rich array of outstanding health sciences research programs, centers, and resources. We will provide infrastructure and opportunities for collaboration among disciplines throughout and beyond our University to support outstanding research. We will foster programs in the areas of basic, translational, mechanistic, and population research.

Position Summary

The Department of Surgery at The University of North Carolina is seeking applications for a full-time academic congenital heart surgeon to join our Division of Cardiothoracic Surgery. The Division of Cardiothoracic Surgery is among 9 clinical Divisions in the Department of Surgery. The Division currently includes 7 faculty members that provide exceptional care to patients from across the state of North Carolina. Academic appointment will be commensurate with the candidate's experience.

The ideal candidate will be mid to late career with a proven track record and requisite experience in all aspects of congenital cardiac surgery. The chosen candidate will be expected to work closely with the current Section Chief of Congenital Cardiac Surgery. The breadth of responsibilities will include neonatal cardiac surgery, pediatric heart failure, transplantation, ECMO, and adult congenital surgery. Preference will be given to individuals who bring unique skills, interests or qualifications to the current faculty in a complementary fashion. Individuals with a strong interest in research are encouraged to apply. Faculty members within the Division of Cardiothoracic Surgery must possess a desire to commit to all three mission of the department and school of medicine, including the clinical, education, and research missions. Regarding the education mission, faculty members are expected to regularly participate in the education of medical students, residents, and fellows. Regarding research, a commitment to any one of a broad array of research interests is desirable, including but not limited to clinical, outcomes, health services, basic science, translational, ethics, education, or global surgery research. Regarding the clinical mission, faculty members must be committed to delivering high quality clinical care that is of value to the patients of UNC. Selected candidate must be team-oriented and have the ability to interact well with colleagues inside and out of the Division.

Minimum Education and Experience Requirements

Prospective candidates must be Board Certified/Board Eligible or Equivalent in Thoracic Surgery and in Congenital Cardiac Surgery.

Preferred Qualifications, Competencies, and Experience

Completion of an ACGME approved Cardiothoracic Surgery Residency and Congenital Cardiac Surgery fellowship is preferred. Chosen candidate should either have a current North Carolina Medical License or be eligible for application.

Please apply online at <https://unc.peopleadmin.com/postings/234256>

The University of North Carolina at Chapel Hill is an equal opportunity and affirmative action employer. All qualified applicants will receive consideration for employment without regard to age, color, disability, gender, gender expression, gender identity, genetic information, national origin, race, religion, sex, sexual orientation, or status as a protected veteran.



enthusiastic and drawing Shak's attention to what I was trying to do when I was a young attending and a registrar in the UK. This allowed Shak to say, "I'm going to give him a crack and see whether he can get up and make a fist of this at the podium." And I think that's important.

JT: Just to add to that, one of the unique selling points of CSI has always been inclusivity. In this meeting we've worked hard to include people and spread discussion out beyond the traditional circles. And that means including young people and people that are growing through the earlier stages of their career. And frankly, that's something that I'm proud of. It's something that we've always tried to do, and we'll continue to do it at CSI.

JZ: Something that is very appreciated by us, the new generations, is that during CSI meetings it is easier to participate in the larger discussions. I think it's important to highlight for people that have not been to CSI meetings, that it is a very relaxed environment that makes everybody participate. During the early career years, it is harder to just stand up to ask a question in front of a big forum. The setup during CSI makes people more comfortable to ask the question, it makes the conversation flow.

Along these lines, one very special session during CSI is the Cathlab Cafe, what are your thoughts on this?

GM: The diversity of presenters at Cathlab Cafe is impressive with people from all around the world presenting phenomenal cases. It allows a way in, and it's a great way to demonstrate the inclusivity of CSI.

ZA: I think the Cathlab Cafe makes the attendee relax. It's like you are going to go for a cup of coffee. If you go for coffee with Shak Qureshi, you can let yourself loose a little bit. After 25 years of practicing, I still learn every time I go to Cathlab Cafe, hence, I think it is a fantastic part of the meeting.

SQ: Just one more thing to add, Jenny. Early on in CSI Frankfurt, Neil and I used to really feel exhausted after each meeting, and on the way back, instead of relaxing, we'd say what did we do right? What did we do badly? And how can we improve it next year? One of the things that we used to do was Neil and I would

walk around and pick on attendees randomly. It wasn't somebody we knew, it would be somebody junior, somebody middle training, somebody senior, and that, what that did was it made people feel really happy and good that we were picking on them. Because it gave them an opportunity to express an opinion, and that was the feedback we used to get. And that's how the whole concept of inclusivity progressed. And Neil was absolutely brilliant at this concept.

JZ: Shak, I think that's something that I personally lived. As I started as a fellow, Neil would come to me during a session at CSI Frankfurt, and tell me: "Are you paying attention?" Walked away, two minutes later, he asked me a question. This was very appreciated. Continuing this dynamic and with that legacy that you have built with Neil, is quite important.

Zahid, what else do you think is going to make CSI America different compared to the other meetings that we have had this year in the US?

ZA: We will hold several sessions in Spanish for the Latin American community. This aims to include more of our Spanish-speaking community and network in their own language. In a few sessions, English will be optional so that the attendees are able to ask questions in Spanish and Portuguese.

JZ: Thanks Zahid, thank you everyone. I am excited to be able to share part of the CSI history with this conversation and also highlight how diversifying the meeting is by bringing new insights and allowing more people to get involved and actively participate in such an amazing conference.

To end the interview, I will ask you some rapid-fire questions, tell me the first thing that comes to mind.

How old were you on your first CSI meeting?

Shak	44
Zahid	32
John	32
Gareth	31

Who do you text the most in the CSI family?

Shak	Inga*
Zahid	Inga*
John	Shak
Gareth	Inga*

*Inga Sievert, CEO at cme4u GmbH and key person for CSI conferences logistics and success

What is the session you do not want to miss and why?

Shak	Paravalvar leaks, mitral in particular. They are interesting because there are so many ways to close them. So, I'm always keen to learn different methods. Session wise it's the nightmare cases for me.
Zahid	"What's new" at CSI Frankfurt. The session in the morning on the first day. Usually what's new, so new devices, techniques or procedures are discussed - that I like a lot.
John	I like the new neonatal intervention sessions because they're difficult. And it's always interesting hearing other people's views and ways of tackling things.
Gareth	I like a bit of psychology through the nightmare cases.

Which CSI was your favourite?

Shak	The meeting where Neil played the melodeon on the rooftop at the faculty dinner.
Zahid	All CSI Frankfurt
John	Being in the bar in the Maritim hotel in Frankfurt, when the singer used to be there in the morning with all the greatest interventional cardiologists, all singing and dancing on the dance floor.
Gareth	Arriving back in my hotel room in a shopping cart at CSI Frankfurt.

What is your favourite procedure to see in live cases?

Shak	It used to be coronary fistula, but now it's more Sinus Venosus ASD.
Zahid	The ones I used to do with Dr. Horst Sievert, when I used to do live cases at CSI.
John	I always like ASD closure. I think there's lots of technique, and there are some fabulous operators from around the world that we're lucky enough to see at CSI, that really teach those things.
Gareth	It's watching Dr. Sivakumar do 12 live cases every year.

What would you prefer - leading training hubs or doing live cases?

Shak	Live cases I think. I get the buzz out of it.
Zahid	Training hub. I love training hub.
John	Either. I don't mind.
Gareth	I think it depends on the subject.





Non-Invasive Pediatric Cardiologist

The division of Pediatric Cardiology, Boston Children's Health Physicians (BCHP), affiliated with New York Medical College and Maria Fareri Children's Hospital, is seeking a board eligible / board certified pediatric cardiologist with expertise in non-invasive imaging (echocardiography: TTE, TEE and Fetal) for Director of Non-Invasive Imaging. In addition to imaging, the candidate will also be able to see general cardiology out-patients. A faculty appointment and rank with NYMC will be determined by previous experience.

Pediatric Electrophysiologist

The division of Pediatric Cardiology, Boston Children's Health Physicians (BCHP), affiliated with New York Medical College and Maria Fareri Children's Hospital, is seeking a board eligible/ board certified pediatric cardiologist as Director of Pediatric Electrophysiology. This person should have experience in arrhythmia management and invasive EP including catheter ablations, device placement and interrogations. In addition to electrophysiology patients, the candidate will also be able to see general cardiology out-patients. A faculty appointment and rank with NYMC will be determined by previous experience.

Boston Children's Health Physicians, a diverse, multispecialty pediatric group practice of over 250 physicians, collaborates with Westchester Medical Center to provide a predominance of the pediatric medical services at Maria Fareri Children's Hospital and has done so for many years. These specialty services include Adolescent Medicine, Cardiology, Critical Care, Developmental Pediatrics, Endocrinology, Gastroenterology, Hematology Oncology, Hospitalist, Infectious Diseases, Pulmonology, Allergy & Immunology, Sleep Medicine, Neonatology, Nephrology, Neurology, and Rheumatology. Maria Fareri Children's Hospital is the only children's hospital in the lower Hudson Valley, offering state-of-the-art tertiary and quaternary care in a truly family-centered environment. BCHP also includes a network of 33 pediatric primary care practices serving the Hudson Valley region of NY and Fairfield County, Connecticut.

To apply, please contact:

Robert Vincent, MD, CM
Chief, Pediatric Cardiology
Boston Children's Health Physicians &
Maria Fareri Children's Hospital
Professor of Pediatrics NYMC
Robert_Vincent@bchphysicians.org or 404.694.1696

Boston Children's Health Physicians is committed to excellence through diversity and inclusion and welcomes candidates of all backgrounds.

BCHP will recruit, hire, train, transfer, promote, layoff and discharge associates in all job classifications without regard to their race, color, religion, creed, national origin, alienage or citizenship status, age, gender, actual or presumed disability, history of disability, sexual orientation, gender identity, gender expression, genetic predisposition or carrier status, pregnancy, military status, marital status, or partnership status, or any other characteristic protected by law.

Program Directory 2023-2024

Published Mid-August

**Directory of Congenital & Pediatric
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UNIVERSITY
OF ALBERTA

Assistant/Associate/Full Professor, Interventional Cardiology Division of Pediatric Cardiology

The University of Alberta, Faculty of Medicine & Dentistry, in partnership with Alberta Health Services (AHS), invites applications for an academic position within the Division of Pediatric Cardiology in the Department of Pediatrics, supporting the Interventional Cardiology Service at the Stollery Children's Hospital.

The University of Alberta is one of the preeminent teaching and research universities in Canada, serving over 39,000 students with more than 15,000 faculty and staff. The Faculty of Medicine and Dentistry has 21 Departments, active undergraduate, graduate, and postgraduate programs with over 500 graduates annually. The Department of Pediatrics is one of Canada's leading academic health centres for pediatric specialty and subspecialty education and research.

Alberta Health Services (AHS) is Canada's first and largest province-wide, fully integrated health system, responsible for delivering health services to over 4.3 million people living in Alberta, as well as to some residents of Saskatchewan, British Columbia, and the Northwest Territories. The Stollery Children's Hospital in Edmonton is part of AHS and is a full-service pediatric hospital and centre for complex pediatric care. It is the only specialized healthcare facility for infants, children, and youth in central and northern Alberta and services cardiac patients in the Northwest Territories. It has among the highest inpatient volumes of any children's hospital in Canada and serves a geographical area of over 500,000 sq km. The Stollery Children's Hospital Cardiac Sciences Program is the 9th largest in North America by surgical volume and second largest in Canada, a quaternary center providing pediatric cardiac surgical services for Western Canada.

Responsibilities

The successful applicant will join eighteen academic pediatric cardiologists providing a full spectrum of clinical pediatric cardiology services with expertise in multi-modal diagnostic imaging, interventional cardiology, electrophysiology, fetal cardiology, heart failure, cardiac transplantation, and preventive cardiology. New subspecialty programs are under development.

The successful applicant will join 2 interventional cardiologists (1 full time and 1 part time) who provide continuous service and support the Stollery Cardiac Sciences Program. In a year, there are more than 400 cardiac catheterization procedures performed with approximately 2/3 of those being transcatheter interventions. The interventional cardiology service supports the Western Canadian Children's Heart Network (WCCHN) and accepts referrals from all three prairie provinces for diagnostic and interventional cardiac procedures. Interventional pediatric cardiologists at our institution work in close collaboration with the adult congenital cardiac interventional program at the University of Alberta Hospital and the Mazankowski Heart Institute which also support all three Canadian prairie provinces. The Division of Cardiology has an active basic and clinical science program, collaborating locally, nationally, and internationally.

In addition to clinical care and research, the division is active in teaching at the undergraduate, graduate, and postgraduate levels. The Division is the home for a fully accredited Pediatric Cardiology subspecialty-training program through the Royal College of Physicians and Surgeons of Canada. There are numerous trainees (undergraduate, graduate, and postgraduate students; residents, and clinical/research fellows) at the Division each academic year.

This is a full time 1.0 FTE position. The position profile will require 60% clinical service and 40% academic pursuits: the distribution of responsibilities is negotiable. Contributions to education and research are expected from all University faculty.

Depending on the seniority and experience of the applicant, this position may include opportunities for clinical leadership within interventional cardiology (i.e. Director of Cardiac Catheterization Laboratory).

Qualifications interested applicants must have:

- MD degree (or equivalent)
- Completed subspecialty training in Pediatrics with subspecialty training in pediatric cardiology
- 1+ years of dedicated training in pediatric interventional cardiology
- 3+ years of recent experience with high volumes of advanced catheter interventions

Considered an asset:

- Clinical experience in lymphatic interventions
- Advanced training or experience in clinical or translational research
- Leadership experience supporting a busy congenital cardiac catheterization program

The applicant must be certified or eligible to become a fellow of the Royal College of Physicians and Surgeons of Canada. See the Royal College of Physicians and Surgeons of Canada for more information on various routes of credentialing (<https://www.royalcollege.ca/public/credentials/routes>). Successful candidates must be eligible for licensure with the College of Physicians and Surgeons of Alberta (CPSA).

The successful candidate will be offered a contingent tenured or tenure-track appointment in the Department of Pediatrics, which is in accordance with the University of Alberta Faculty Agreement and offers a comprehensive benefits package.

Remuneration for this position will be commensurate with qualifications and experience and will be based on the income scale of a competitive and highly successful academic alternate funding plan.

Interested applicants should apply below with their curriculum vitae and letter of application. If you have any questions about the posting, please reach out to Sarah Forgie, SForgie@ualberta.ca, or Lisa Hornberger, Lisa.Hornberger@albertahealthservices.ca.

Apply Online: <https://apptrkr.com/4477617>

All qualified candidates are encouraged to apply; however, Canadians and permanent residents will be given priority. The University of Alberta is committed to an equitable, diverse, and inclusive workforce. We welcome applications from all qualified persons. We encourage women; First Nations, Metis and Inuit persons; members of visible minority groups; persons with disabilities; persons of any sexual orientation or gender identity and expression; and all those who may contribute to the further diversification of ideas and the University to apply. The University of Alberta is committed to an equitable, diverse, and inclusive workforce. We welcome applications from all qualified persons. We encourage women; First Nations, Metis and Inuit persons; members of visible minority groups; persons with disabilities; persons of any sexual orientation or gender identity and expression; and all those who may contribute to the further diversification of ideas and the University to apply.

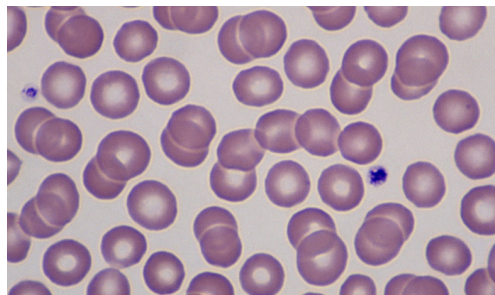


Research Reveals Blood Platelets Play Important Role in Kawasaki Disease

Findings From Cedars-Sinai Investigators Suggest Another Therapeutic Approach for This Mysterious Pediatric Disease

Cedars-Sinai Guerin Children’s investigators have advanced our understanding of the role that blood platelets play in Kawasaki disease, a serious illness that primarily affects children younger than 5 years old and causes their blood vessels to swell.

The findings, published in the peer-reviewed journal *JCI Insight*, may guide the development of a new treatment for the approximately 20% of children with Kawasaki disease who are not helped by current standard therapy. They also suggest a new biological marker clinicians can use to measure disease severity.



The latest research from Cedars-Sinai Guerin Children’s investigators has advanced our understanding of the role that blood platelets (shown here in dark purple) play in Kawasaki disease. Photo by Getty.

Without timely treatment, Kawasaki disease can damage the heart and its arteries, causing coronary artery abnormalities such as dilatation and aneurysms.

"We now have a better understanding of how this disease attacks blood vessels, which we can use to develop new therapies," said Moshe Ardit, MD, executive vice chair of the Department of Pediatrics for Research, part of



Moshe Ardit, MD
Photo by Cedars-Sinai



Magali Noval Rivas, PhD
Photo by Cedars-Sinai

Guerin Children’s, and corresponding author of the study.

It was already known that children with Kawasaki disease typically develop an increased platelet count a few weeks after their first symptoms. But it was unclear until now if—and how—the platelets might contribute to cardiovascular damage.

Although rare, Kawasaki disease is the leading cause of acquired heart disease in children and adults in the U.S. The disease was first described in Japan by pediatrician Tomisaku Kawasaki in 1967.

The first symptom of Kawasaki disease is usually a sudden fever that lasts several days. The disease can also cause a rash, swelling in the hands and feet, red eyes, swollen lymph nodes and other symptoms. Scientists hypothesize that Kawasaki disease is triggered by a viral infection, but its exact cause is not yet known.

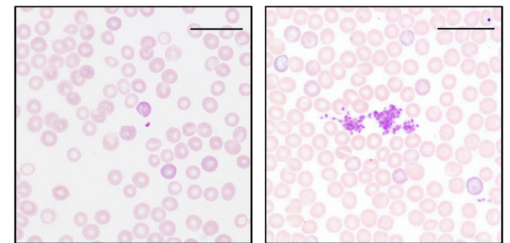
The standard treatment regimen for Kawasaki disease is an initial round of intravenous immunoglobulin (IVIG), which is meant to strengthen the body’s immune system, and high- to moderate-dose aspirin to address acute inflammation, followed by low-dose aspirin for an anti-platelet, blood-clotting effect.

In previous studies, scientists such as Ardit and colleagues reported that a group of proteins involved in the body’s inflammatory response called interleukin-1 might contribute to damage in the heart and blood vessels of children with Kawasaki disease.

Arditi and colleagues reported that two inflammatory molecules, IL-1 α and IL-1 β , which signal through the interleukin-1 receptor, induce heart damage and aneurysm formation in laboratory mice with a Kawasaki-like illness. They also have discovered that treatments that work against IL-1 molecules or against the interleukin-1 receptor may prevent coronary artery lesion formation. Their work has led to clinical trials involving a treatment called anakinra, which suppresses and blocks the function of the interleukin-1 receptor.

In their latest study, investigators describe the interactions between platelets and monocytes, which are a type of white blood cell. The three classes of cells that circulate in blood are white blood cells, red blood cells and platelets.

To reach these findings, Ardit and colleagues analyzed blood samples from children with Kawasaki disease and discovered the genes involved in the activation of platelets are overexpressed more frequently during intense phases of the disease.



Pictures of blood smears from laboratory mice with a Kawasaki-like illness (right) show an accumulation of platelets as compared with blood smears from laboratory mice without Kawasaki disease (left). Image by Cedars-Sinai.

The investigators also studied laboratory mice with Kawasaki-like inflamed blood vessels and noted increased platelet counts. In addition, they observed the formation of monocyte-platelet aggregates (MPAs), which occur when platelets bind to monocytes. Platelets and MPAs are known to increase production of interleukin-1.

"It is likely MPAs amplify the production of IL-1 β s and thus stimulate inflammation that causes vascular damage," said Magali Noval Rivas, PhD, Associate Director of the Infectious and Immunological Diseases Research Center and assistant professor of Pediatrics and Magali Noval Rivas, PhD Biomedical Sciences at Cedars-Sinai, and another senior author of the study.

Investigators observed that laboratory mice with a Kawasaki-like illness and a higher number of MPAs also had increased IL-1 β formations and were more likely to have vascular lesions. When the investigators used certain drugs to deplete the platelets in mice, which led to less MPA formation, the severity of the blood vessel inflammation and lesions decreased.

"These findings support a strategy involving therapy to block MPA formation, especially in children whose bodies don’t respond to IVIG, and at the end emphasizes the importance of anti-IL-1 therapies in Kawasaki disease patients," said Ardit, who is also the GUESS?/Fashion Industries Guild Chair in Community Child Health and leads the Infectious and Immunologic Diseases Research Center at Cedars-Sinai.



"MPAs could also serve as a potential marker of disease severity that could help with tailoring the intensity of treatments."

Other Cedars-Sinai investigators involved in the study include Youngho Lee, PhD; Nobuyuki Nosaka, MD, PhD; Masanori Abe, MD, PhD; Daisy Martinon; Malcolm Lane; Debbie Moreira; Shuang Chen, MD, PhD; and Rebecca A. Porritt, PhD.

"This study and others from Arditi and colleagues are laying the groundwork for a significantly different treatment landscape for children with Kawasaki disease," said Ophir Klein, MD, PhD, executive director of Cedars-Sinai Guerin Children's and the David and Meredith Kaplan Distinguished Chair in Children's Health.

Arditi and colleagues continue to study the processes involved in the development of cardiovascular lesions in Kawasaki disease and potential ways to block MPAs and IL-1 pathways.

Funding: The study was funded by the National Institutes of Health (award numbers R01AI072726, R01HL139766, R01HL159297 and R01AI157274).



Outpatient Imaging Cardiologist

The Ward Family Heart Center at Children's Mercy Kansas City seeks a pediatric cardiologist at the assistant or associate professor level who would have equal roles in echocardiography and general outpatient cardiology. The successful candidate would join an existing group of 28 cardiologists (25 in Kansas City, 2 in Wichita, KS and 1 in Topeka, KS), 4 CV surgeons, 30 APNs. Experience and interest in peri-operative and peri-procedural TEE is a must. Proficiency in 3D and stress echocardiography is preferred. Training/knowledge in MR/CT imaging is preferred but not required. Trainees in their final year are welcome to apply. In addition to providing echocardiography coverage, the successful candidate will be expected to spend one-two days per week in our local general outpatient clinics and serve as attending on cardiology inpatient or consult service 4-6 weeks/year.

Candidates must be board-certified or board-eligible in Pediatric Cardiology. Strong communication skills are key. There are ample opportunities for clinical/translational research and teaching (medical students, residents and Pediatric Cardiology fellows). Salary and academic rank are commensurate with experience.

Our Heart Center serves a population of over 5 million in the heart of the U.S.A. We perform over 500 cardiac operations, 600 cardiac catheterizations including over 200 invasive EP procedures, 18,000 outpatient visits, and more than 20,000 echocardiograms annually. Our two state-of-the-art catheterization labs are both hybrid labs and equipped with the latest 3D imaging and EP technology. Telehealth is available and facilitates our outreach clinics. We have video-conferencing capabilities that are routinely used by providers from distant locations to dial into our conferences for patient care and education. In 2022, the Ward Family Heart Center program was ranked #19 nationally by USNWR.

Our super-specialty resources include Electrophysiology (which includes Clinical EP, pacing and Genetic Arrhythmia), Cardiac Transplantation/Heart Failure, Interventional Cardiology and Advanced Cardiac Imaging (fetal echo, 3D echo, trans-esophageal echo, CT, MRI and 3D printing). We also provide specialized, team-based care in Fetal Cardiology (with on-site delivery services for high-risk neonates), Interstage Monitoring (CHAMP), Preventive Cardiology, Cardiac Genetics, Cardio-oncology, Single Ventricle Survivorship, Pulmonary Hypertension, a dedicated POTS clinic and Cardiac Neurodevelopmental Services.

Please submit CV and cover letter to:
<https://faculty-childrensmercykc.icims.com/jobs/22724/physician/job>

For more information:

Aliessa Barnes MD
 Co-Director, Ward Family Heart Center; Chief, Section of Cardiology
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For more information about Children's Mercy Kansas City and about Kansas City itself, visit cmkc.link/TakeYourPlace.

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

**DukeHealth**

Duke Pediatric Cardiology Transplant Physician

Duke Pediatric Cardiology and Duke University School of Medicine are seeking an early to mid-career pediatric cardiac transplant/heart failure physician to join our transplant/heart failure team. Candidates should be academically motivated, BE/BC in pediatric cardiology and have advanced training and/or experience in pediatric transplant and heart failure. This position will focus on care in both the in-patient and outpatient settings for the cardiology transplant/heart failure service. The ideal candidate would be motivated to work within a high functioning transplant/heart failure service seeking to provide innovative care to a rapidly expanding patient population. Applicants with research interests/funding are also invited to apply.

The Duke Pediatric and Adult Congenital Heart Center is one of the highest volume pediatric heart programs in the United States. Ranked #7 in 2022 by U.S. News and World Reports for Pediatric Cardiology and Heart Surgery ([USNWR pediatric-rankings: cardiology-and-heart-surgery](#)), and recognized for exceptional outcomes ([STS Public Reporting Outcomes](#)), the program has experienced exponential growth over the past 4 years. The current Pediatric Heart Failure/Transplant team consists of 2 Transplant Cardiologists, 2 Nurse Practitioners, a dedicated Pediatric Heart Transplant Coordinator, 4 Congenital Cardiac Surgeons, and additional allied healthcare team members. In 2022 the program performed 14 pediatric heart transplants including numerous innovative approaches such as the [first pediatric “donation after circulatory death \(DCD\)” heart transplant performed in the United States](#), [the first ever partial heart transplant](#) and the [first ever heart-thymus co-transplant](#).

Visit Duke Division of Pediatric Cardiology at <https://pediatrics.duke.edu/divisions/cardiology>

The greater Triangle area of **Raleigh, Durham, and Chapel Hill**, has a population of more than two million residents that offers diverse opportunity. From urban loft living to suburban and rural family homes with acreage – there are options for every lifestyle. The Research Triangle Park (RTP) lies in the midst of the area, a globally prominent research and development center conceived around the main academic centers – Duke University, University of North Carolina, and North Carolina State University. This trio of leading universities, combined with the RTP, has helped create a region that is culturally diverse, economically resilient, and nationally recognized as a wonderful place to live. To learn more about the Duke and Greater Triangle communities, visit <https://www.discoverdurham.com/>

Interested candidates should submit CV and Letter of Interest via:
<https://www.practicematch.com/physicians/job-details.cfm/846879>

With a deep commitment to attracting and retaining a diverse staff, Duke University will honor your experiences, perspectives and unique identity. Together, our community strives to create and maintain working, learning and care environments that are inclusive, equitable and welcoming.

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Contact Info:

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sherrod.basnight@duke.edu



ÖNÖCOR Signs an Exclusive US Distribution Agreement with B. Braun Interventional Systems Inc.

ÖNÖCOR LLC, a medical technology company dedicated to developing essential safety tools and other facilitating technologies for the modern-day catheterization lab, today announced that they have signed an exclusive distribution agreement with B. Braun Interventional Systems Inc. (BIS) as an important next step in preparation for the commercial launch of the ÖNÖ Retrieval Device in the US.

Under the agreement, BIS will initiate the US commercialization activities for ÖNÖCOR's ÖNÖ Retrieval Device. Through the collaboration, ÖNÖCOR positions itself for success as an innovator of safety technology in the growing market of catheter-based interventions, while BIS expands its portfolio around its strong congenital and structural heart focus.

The ÖNÖ is a novel device designed to receive, align, compress and remove material (non-biologic and biologic) from the vascular system. The ÖNÖ is intuitive to use and is compatible with commercially available vascular sheaths, endovascular snares and other graspers. It is designed to make catheter-based retrieval less tedious, faster and safer as well as mitigate the need for remedial surgical procedures. The ÖNÖ received FDA clearance in May 2022.

"We are very pleased to partner with ÖNÖCOR to bring the novel and highly anticipated ÖNÖ Retrieval Device to the market," said Peter Flosdorf, Director, Upstream Marketing and Portfolio Strategy, who led the establishment of a partnership between the two companies for B. Braun Interventional Systems. "The ÖNÖ pushes the boundaries of how we can serve the needs of congenital and structural heart interventional cardiologists and the patients they treat. Our shared dedication to innovation in safety technologies and expanding the capabilities of transcatheter interventional procedures position the collaboration between our companies for long-term success."

The ÖNÖ has been used at select US catheterization labs since 2022. The teams at ÖNÖCOR and BIS plan to conduct a limited launch of the retrieval device this summer with the full launch planned for the PICS Society Annual Symposium in August.

"We've always believed that the ÖNÖ would be a tool that helps physicians safely expand the scope of minimally invasive procedures," said Mark Piper, CEO of ÖNÖCOR. "We are thrilled to have entered into an agreement with B. Braun Interventional Systems that will allow every interventionalist performing a catheter-based procedure to have an ÖNÖ device at hand."

Two dozen ÖNÖ clinical use cases have been accomplished thus far, including several published case reports by early users. Additionally, clinical evidence on the use of the ÖNÖ Retrieval Device been recently presented at several scientific meetings, including, the SCAI Scientific Sessions 2023, and the CSI Frankfurt 2023 meeting.

*The ÖNÖCOR LLC ÖNÖ retrieval device is indicated for use in the cardiovascular system to retrieve foreign objects using minimally invasive procedures. For complete instructions and other important safety information for the ÖNÖ, please refer to the Instructions for Use.



About ÖNÖCOR

ÖNÖCOR LLC is a medical technology company dedicated to developing essential safety tools and other facilitating technologies for the modern-day catheterization lab. For more information, please go to www.onocorvascular.com.

About B. Braun Interventional Systems

B. Braun Interventional Systems offers interventional solutions designed with the patient in mind. Many of the products offered have been developed in response to the needs of physicians, technicians, and nurses. The company is committed to delivering safety, precision and convenience to interventional procedures. B. Braun Interventional Systems Inc. is part of the B. Braun Group of Companies in the U.S., which is headquartered in Bethlehem, Pa., and includes B. Braun Medical Inc., Aesculap® and CAPS®.

Globally, the B. Braun Group of Companies employs more than 64,000 employees in 64 countries. Guided by its Sharing Expertise® philosophy, B. Braun continuously exchanges knowledge with customers, partners and clinicians to address the critical issues of improving care and lowering costs. To learn more about B. Braun Interventional Systems Inc., visit www.bisusa.com about-us and connect with B. Braun Interventional Systems on LinkedIn.



CHIP NETWORK
CONGENITAL HEART INTERNATIONAL PROFESSIONALS



OCTOBER

23RD**TCT 2023**

San Francisco, California, USA

https://tct2023.crfconnect.com/register?utm_source=08082023&utm_medium=email&utm_campaign=tct2023&utm_content=tct_program_directors_and_faculty_emory--btn

28TH**13th Annual UCLA Fetal Echocardiography Symposium**

Westwood, California, USA

<https://events.medschool.ucla.edu/event/fetalcardiac23>

NOVEMBER

10TH-11TH**CSI FOCUS LAA 2023**

Frankfurt, Germany

<https://www.csi-congress.org/laa>

15TH-17TH**CSI America - Catheter Interventions in Congenital, Structural and Valvular Heart Disease and Heart Failure**

Orlando, Florida, USA

<https://www.csi-congress.org/laa>

22ND-23RD**ALICE 2023**

Essen, Germany

<https://alice-the-course.info/>

DECEMBER

8TH-9TH**CSI FOCUS D-HF 2023**

Frankfurt, Germany

<https://www.csi-congress.org/dhf>



Pediatric General Cardiologist

The Ward Family Heart Center at Children's Mercy Hospital, Kansas City, is seeking a general pediatric cardiologist to cover clinics in the Kansas City Metroplex, regional clinics, and some inpatient service. The successful candidate would join an existing group of 30 cardiologists (28 in Kansas City, 1 in Wichita, KS and 1 in Topeka, KS), 4 CV surgeons, and over 30 APNs.

Our Heart Center serves a population of over 5 million in the heart of the U.S.A. We perform over 500 cardiac operations, 600 cardiac catheterizations including over 200 invasive EP procedures, 18,000 outpatient visits, and more than 20,000 echocardiograms annually. Our two state-of the art catheterization labs are both hybrid labs and equipped with the latest 3D imaging and EP technology. Telehealth is regularly used to provide care to our families in the region.

Our Kansas City-based super-specialty resources include Electrophysiology (which includes Clinical EP, pacing and Genetic Arrhythmia), Cardiac Transplantation/Heart Failure, Interventional Cardiology and Advanced Cardiac Imaging (fetal echo, 3D echo, trans-esophageal echo, CT, MRI and 3D printing). We also provide specialized, team-based care in Fetal Cardiology (with on-site delivery services for high-risk neonates in Kansas City), Interstage Monitoring (CHAMP), Preventive Cardiology, Cardiac Genetics, Cardio-oncology, Single Ventricle Survivorship, Pulmonary Hypertension, a dedicated POTS clinic and Cardiac Neurodevelopmental Services. In 2022, the Ward Family Heart Center program was ranked # 19 nationally by USNWR.

Board eligibility in Pediatric Cardiology is required. Flexibility, strong communication and collaborative skills are key. There are opportunities for clinical research and teaching medical students, residents and fellows. Salary and academic rank are commensurate with experience.

Please submit CV and cover letter to:

<https://faculty-childrensmercykc.icims.com/jobs/25378/physician/job>

For more information:

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Kansas City is a thriving cultural and economic city with more than 2 million residents. Our city's long list of attractions includes world class museums, a vibrant arts scene, professional sports, superb shopping, great jazz clubs, and the best places to enjoy barbeque! For more information about activities in Kansas City go to www.visitkc.com



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TODAY

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