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Utility of 3D and Real Time 3D Transesophageal (TEE) Echocardiography in Pediatric Interventional Suite Decision Making for Atrial Septal Defect (ASD) Closures – A Case Series

Umang Gupta, MD, MBA

Keywords: 3D echocardiography, Congenital Heart Disease, device closure, Atrial Septal Defect

Introduction

While the role of 3D imaging has been identified for structural and congenital cardiac defects, its implementation has been very slow. This is likely related to lack of specific training, limitations of appropriate software on the cart and time intensive processing of more complex lesions. With advancement in probe technology and software quality, there has been a renewed interest to utilize it in real time during procedures in pediatric patients with structural and congenital heart disease. This is likely to be boosted by recent availability of a pediatric 3D TEE probe. In our experience we have found 3D echocardiography imaging to provide valuable and unique information that complements 2D imaging information and helps in decision making.

In this report we describe a series of two such cases where we found that the 3D and real time 3D imaging provided additional information that was not available through 2D Imaging. In each of these cases the additional information impacted the decision making and management. The images were obtained using Philips IE 33 machine with X8-2t ultrasound probe. The modalities used were real time 3D and zoom features and processed on the cart before acquisition.

Case Presentation

Case 1

The first case we describe is of an 18-year-old woman who initially presented to Cardiology clinic for shortness of breath and chest pain. As a part of her workup, a transthoracic echocardiogram was obtained that showed the presence of large Atrial Septal Defect (ASD). Due to limitations of the windows, however, the margins of the ASD could not be clearly delineated. She was referred for TEE with 3D imaging to further delineate the anatomy of the defect and for device closure, if amenable. With this goal, she was brought to the Pediatric Cath lab for the TEE and the lab was prepared to perform device closure if deemed suitable for it.

The TEE obtained confirmed the large defect, but also identified a markedly deficient inferior vena cava (IVC) rim, making it not amenable to device closure (**Figures 1-3**). It also confirmed the absence of inferior sinus venous defect, and an encircling sliver of tissue was identified at the IVC margin (**Figure 1 & 2**). With these findings, she was deemed not to be a candidate for device closure and was referred for surgery. The findings of the TEE were confirmed visually by the surgeons at the time of repair. After an uneventful postoperative course, the patient was discharged home.

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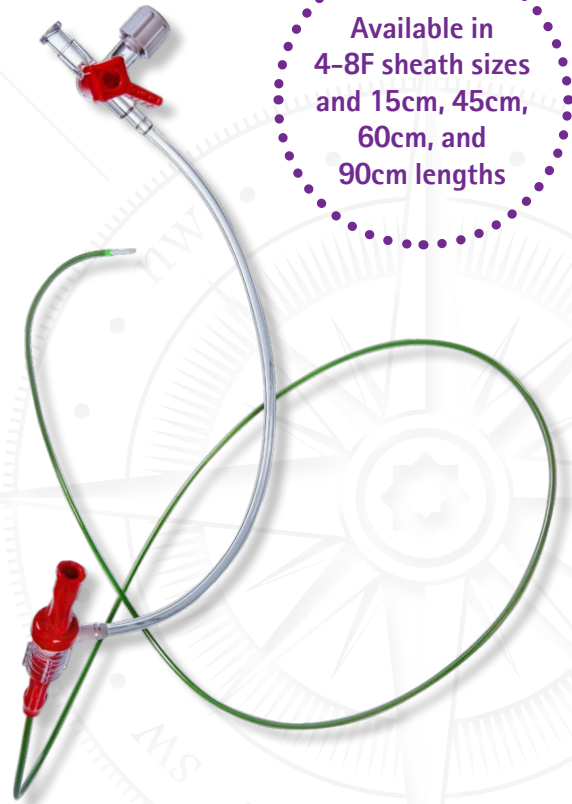
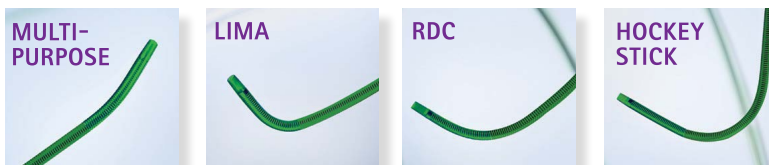
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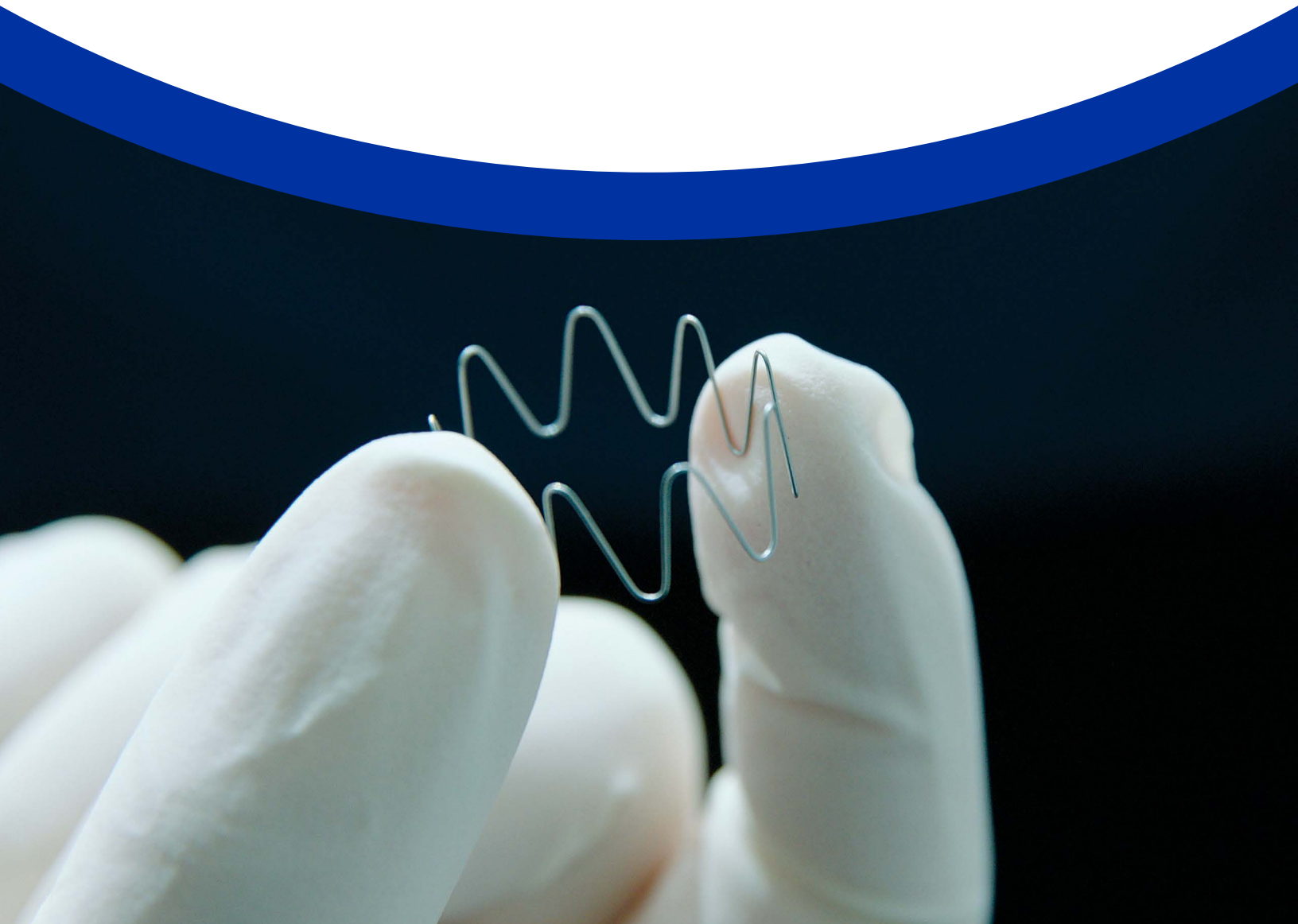
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The following are contraindications for the use of this device: active bacterial endocarditis or other active infections, known intolerance to Nitinol (titanium or nickel), or an anticoagulation/antiplatelet regimen.

Warnings

General: Implantation of the Harmony TPV system should be performed only by physicians who have received Harmony TPV system training. The transcatheter pulmonary valve (TPV) is to be used only in conjunction with the Harmony delivery catheter system (DCS). This procedure should only be performed where emergency pulmonary valve surgery can be performed promptly. Do not use any of the Harmony TPV system components if any of the following has occurred: it has been dropped, damaged, or mishandled in any way, or if the use-by date has elapsed.

Transcatheter pulmonary valve (TPV): This device was designed for single use only. Do not reuse, reprocess, or resterilize the TPV. 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 resterilize the TPV by any method. Exposure of the device and container to irradiation, steam, ethylene oxide, or other chemical sterilants renders the device unfit for use. The device is packaged with a temperature sensor. Do not freeze the device. Do not expose the device to extreme temperatures. Do not use the device if the arrow on the sensor points to the symbol that indicates that the temperature limit has been exceeded. Do not use the device if any of the following have occurred: the tamper-evident seal is broken, the serial number tag does not match the container label, the arrow on the sensor points to the symbol that indicates that the temperature limit has been exceeded, or the device is not completely covered by the storage solution. Do not contact any of the Harmony TPV system components with cotton or cotton swabs. Do not expose any of the Harmony TPV system components to organic solvents, such as alcohol. Do not introduce air into the catheter. Do not expose the device to solutions other than the storage and rinse solutions. Do not add or apply antibiotics to the device, the storage solution, or the rinse solution. Do not allow the device to dry. Maintain tissue moisture with irrigation or immersion. Do not attempt to repair a damaged device. Do not handle the valve leaflet tissue or use forceps to manipulate the valve leaflet tissue. Do not attempt to recapture the device once deployment has begun. Do not attempt to retrieve the TPV if any one of the outflow TPV struts is protruding from the capsule. If any one of the outflow TPV struts has deployed from the capsule, the TPV must be released from the catheter before the catheter can be withdrawn. Do not attempt post-implant balloon dilatation (PID) of the TPV during the procedure, which may cause damage to or failure of the TPV leading to injury to the patient resulting in reintervention.

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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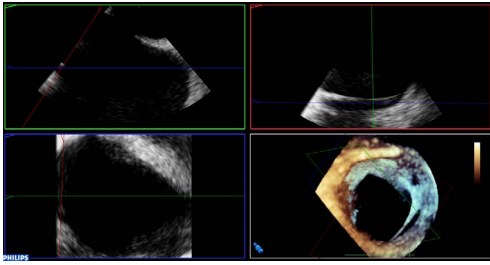


FIGURE 1 Multiplanar reconstruction from 3D dataset acquired in 4 chamber view at mid esophageal level by TEE showing large atrial septal defect with deficient IVC rim. The blue plane shows the enface view of the large ASD and the red plane shows the IVC entering the right atrium and the thin rim separating it from ASD.

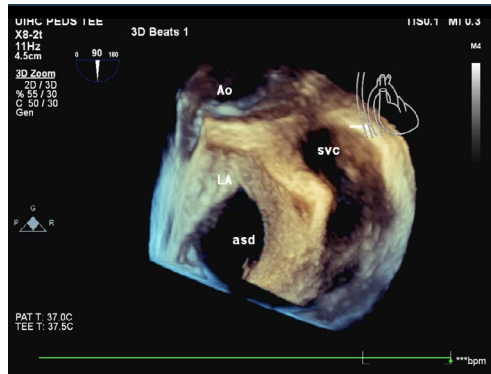


FIGURE 3 Another zoomed reconstructed view of the ASD from the Left atrial side (LA) showing adequate aortic and SVC rims. Ao = aorta, SVC= superior vena cava, asd = Atrial septal defect.

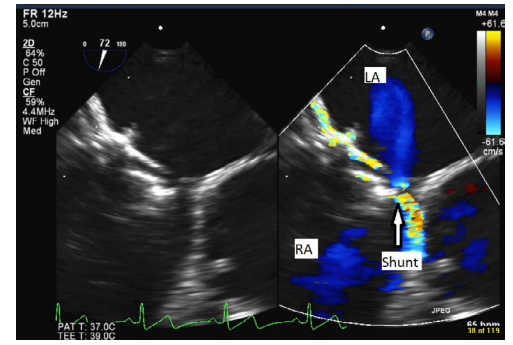


FIGURE 5 Mid esophageal TEE view with probe rotated to 70 degrees showing ASD device in place but before release. Note the shunt at the aortic rim of the device. Aortic rim could not definitively be confirmed between the discs of the device on 2D-imaging.

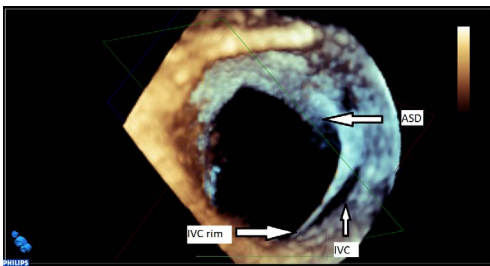


FIGURE 2 Zoomed reconstructed 3D image showing the large ASD and deficient IVC rim. This is looking from the right atrium. IVC is seen entering the right atrium and no inferior sinus venosus defect seen. IVC= Inferior vena cava, ASD = Atrial septal defect.

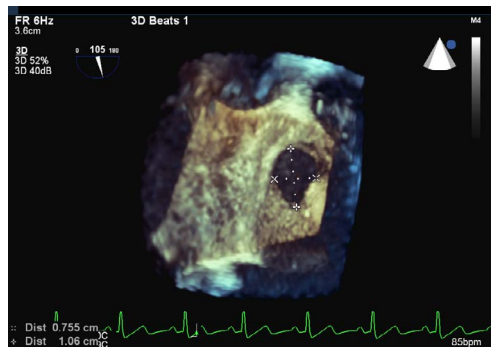


FIGURE 4 Reconstructed 3D Zoom view of the atrial septal defect from the right atrial side with measurements.

Case 2

The second case we describe is of a 15-year-old child who was initially referred for cardiac evaluation for a murmur. A transthoracic echocardiogram was done as a part of workup that revealed a moderate size ASD with left-to-right shunt and adequate margins. Hence, patient was referred for percutaneous device closure.

In the Cath lab, TEE was performed that confirmed the diagnosis as well as the adequacy of the margins (**Figure 4**). Hence, the decision was made to proceed with device closure. TEE assistance was provided during the procedure to minimize the need for fluoroscopy. After the initial device deployment, the 2D TEE imaging continued to show a residual shunt near the aortic rim (**Figure 5**) and 2D imaging could not confirm the presence of the aortic rim between the discs of the device. To further delineate the position of the device, real time 3D

imaging was performed focusing on the aortic rim of the defect and position of the device relative to that. The additional imaging showed an appropriate and stable position of the device (**Figure 6**). Hence decision to release it was made. After the release, the previously seen shunt disappeared and follow-up images showed a well-placed device confirming the 3D findings (**Figure 7 & 8**). After an uneventful overnight stay the echo was repeated next day and on follow-up, and confirmation was made that the device was stable and well-placed with no residual shunts.

Discussion

Echocardiography, starting with the initial use of M mode and progressing through advances to current use of 2D, 3D and real time 3D imaging of heart, has led to dramatic improvements in cardiovascular medicine and has now become the workhorse of cardiac imaging.¹

The first descriptions of its application came about in mid-1930's and the first clinical applications of M-mode echocardiography was introduced in 1950's. These initial applications were focused on the assessment of the mitral valve using the shapes of the corresponding waveforms. Subsequently, the various M-mode recordings were related to their anatomical origins. Contrast echocardiography, which was introduced in the 1960's, led to further progress in the understanding of the cardiovascular diseases. 2D imaging was first introduced in 1950's, getting established in 1960's. Around the same time, the TEE was introduced as a modality in late 1960's. The introduction of Pulse doppler imaging in the same decade further increased the tools that we had to investigate the heart. Combined together these innovations in imaging set the stage to leapfrog our understanding of diseases and manage them in ways that were not possible just a few decades ago.² The impact of echocardiography was commended on by Feigenbaum in his article in 1996.³

Around the same time that these capabilities were added to our investigative armamentarium, the idea of 3D echo was introduced with first 3D images reported in 1974.

Further advancement in echocardiography had two facets. On one end, we saw introduction of more sophisticated application of doppler imaging with introduction of tissue doppler in 1990's as well as speckle tracking and intracardiac

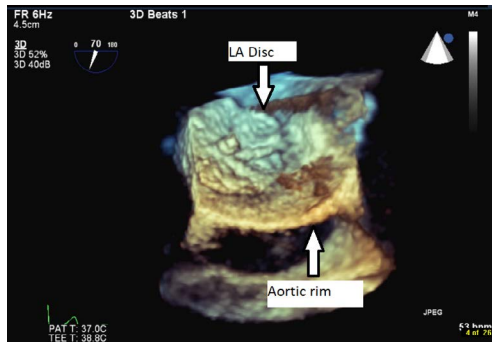


FIGURE 6 The real time 3D Zoom image obtained from mid-esophageal view with probe rotation to about 70 degrees shows the device is well placed with aortic rim between the two discs of the ASD device.

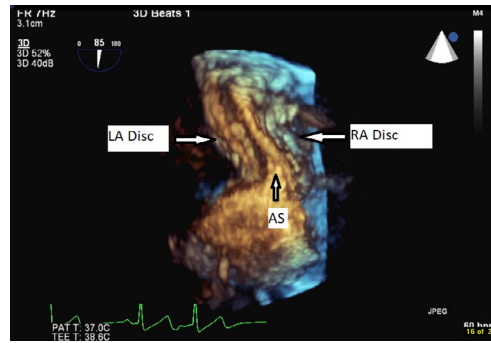


FIGURE 7 The real time 3D Zoom image obtained at mid-esophageal level in bicaval plane (probe rotation to 90 degree) showing the device sitting well across the atrial septal defect after release.

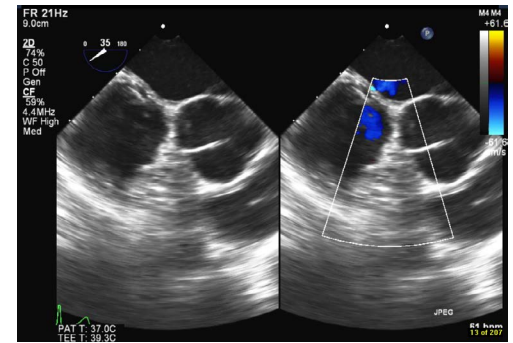


FIGURE 8 Mid esophageal TEE view with probe rotation to 35 degrees showing no residual shunt at the atrial level after the device release.

imaging.⁴ On the other end, these modalities have been introduced to investigate diseases in pediatric patients and with more complex lesions.

Along with these developments, the hardware has also seen significant improvements over the last few decades. This has enabled its use to support interventional techniques for percutaneous treatment of structural heart defects⁵ and other interventional procedures.⁶ The role of 3D and 4D imaging has also been recognized in both structural / congenital and functional analysis.⁷⁻¹¹ Roberson and Cui were one of the first investigators who described the use of TEE for ASD closures and proposed protocols for it.⁷ With expanding knowledge and need for standardization, EAE/ASE recommendations for image acquisition and display using three-dimensional echocardiography were published followed by similar consensus document for Congenital Heart Diseases.⁸⁻¹¹

Our case series is an attempt to increase the experience in this direction, highlighting the usefulness of the 3D and 4D echo to provide additional clinically important information that cannot be gleaned by 2D imaging. We are confident this will provide motivation to those who are wishing and contemplating to start utilizing this modality in the pediatric population with congenital and structural heart disease. For those who are using it but sporadically, we hope this report will serve as a reminder to use it for decision making.

Fortunately, the development in echocardiography is complemented by developments in other modalities including cardiac CT and CMR imaging, though integration across platforms is lacking. A future goal should be to integrate multiple modalities to improve patient outcomes.

Conclusion

Since its humble beginning, the echocardiography has come a long way to become the mainstay of cardiac evaluation. The 3D imaging has further boosted its utility. However, because of significant limitations its adoption in investigating congenital and structural heart defects has been slow. But as our cases show, it is a valuable tool and in select cases provides information that cannot be obtained through 2D imaging. This information impacts management. Hence, its use should be considered in any scenario where the 2D imaging is not enough to provide the information.

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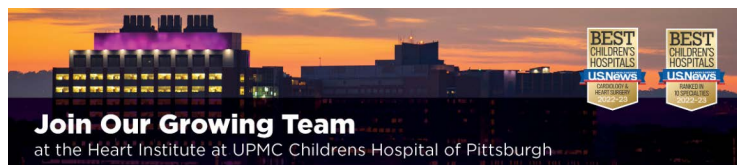
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- As a member of the division of pediatric cardiology and core imaging faculty, the Director of Perinatal Cardiology will also provide direct inpatient and outpatient care, read transthoracic and perform transesophageal echocardiograms. Additionally, this individual will participate in fellow, resident, and medical student teaching and have a demonstrated commitment to academic and clinical excellence in pediatric cardiology. Preference will be given to candidates with more than 5 years of post-fellowship cardiology experience, experience with developing a fetal cardiology program, and those with an interest and track record for academic success in fetal medicine.

This position comes with a competitive salary and faculty appointment commensurate with experience and qualifications at the University of Pittsburgh School of Medicine. The University of Pittsburgh is an Equal Opportunity/Affirmative Action Employer. Interested individuals should forward a letter of intent curriculum vitae, and three letters of reference. Informal inquiries are also encouraged.

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Adult Congenital Transthoracic Echocardiography Accreditation

Recognizing the critical role of facilities providing care to patients with congenital heart disease who transition their care from pediatric cardiology to adult cardiology services, **IAC is pleased to announce the upcoming availability of a new accreditation testing area, Adult Congenital Transthoracic Echocardiography.**

The *IAC Standards & Guidelines for Adult Congenital Transthoracic Echocardiography* have been established to provide guidance in training and experience, protocol development and resources needed to perform and interpret echocardiograms on patients with complex, congenital heart disease. By achieving IAC accreditation, facilities will demonstrate their commitment to high quality, specialized diagnostic imaging, to patients and referring physicians.

IAC Echocardiography is widely respected in the field of echocardiography as illustrated by the support of national medical societies who each serve as a sponsoring organization, including the **Adult Congenital Heart Association (ACHA).**

"As a long standing member of the medical advisory board of the Adult Congenital Heart Association (ACHA), I am excited to see the new Adult Congenital Transthoracic accreditation guidelines. This is another great step forward to help ensure that adult congenital heart disease patients across the country have access to high standard, accessible, comprehensive imaging."

- Michael G. Earing, MD, MS Healthcare Management

Member of IAC Echocardiography Board of Directors, Representing ACHA / Medical Director of the Chicago Adult Congenital Heart Disease Alliance

The new program will be available to applicant facilities later in 2022.

Stay informed! Sign up to receive program updates at intersocietal.org/signup.

Diagnostic Imaging Accreditation

Vascular Testing . Echocardiography
Nuclear/PET . MRI . CT / Dental CT



Vascular and Cardiac Intervention Accreditation

Carotid Stenting . Cardiac Electrophysiology
Vein Center . Cardiovascular Catheterization



The Other Vein That Stayed: Isolated Persistent Left Superior Vena Cava – A Case Report

Shivani Thacker, BA; Chandana Shekar, MD; Matthew Budoff, MD

Abstract

A Persistent Left Superior Vena Cava (PLSVC) is a rare congenital anomaly that results when the part of the left anterior cardinal vein caudal to the innominate vein fails to regress. The presence of a PLSVC is often incidentally found. It leads to difficulty accessing the right side of the heart through a left subclavian venous approach, which is the standard access for pacemaker or defibrillator placement. We report a case of PLSVC with an absent right Superior Vena Cava (SVC).

Learning Objective

Isolated PLSVC is a rare congenital anomaly which is typically asymptomatic and is most often discovered during central venous catheterization or pacemaker implantation. Cardiologists should consider the presence of a PLSVC when a catheter or guide wire inserted via the left subclavian approach makes an abnormal left-sided downward course. It must be confirmed with the use of imaging modalities like CTA which allows for accurate anatomical pictures. Once identified, the presence of a PLSVC should be well documented so that it can help overcome cardiac procedural challenges in the future.

Introduction

Though PLSVC is a rare vascular anomaly, it is the most common type of congenital malformation of the thoracic venous system. It affects 0.5-2% of the general population and 10% of patients with congenital cardiac malformations.¹ It results when the left superior cardinal vein caudal to the innominate vein fails to regress.² It is less frequent, however, to have a PLSVC with absent right SVC, which only occurs in 0.09-0.13% of the general population.³ An isolated PLSVC is asymptomatic and is often incidentally found when it poses technical difficulties for vascular access via left cephalic or subclavian approach. Awareness of this anatomical anomaly is critical in minimizing the risks of potential complications during invasive cardiac procedures.

Case Presentation

A 70-year-old female with a history of previous myocardial infarction, chronic systolic heart failure (New York Heart Association Class II-III), type 2 diabetes mellitus, hypertension, and hyperlipidemia were evaluated for Cardiac Resynchronization Therapy-Defibrillator (CRT-D) placement. The procedure was attempted via left subclavian venous approach, and a micropuncture wire was inserted through the needle which

had demonstrated venous blood flow. While advancing the micropuncture wire, it took a 90° angle to return to the hind aorta and the retrocardiac position, consistent with a PLSVC attached to the Coronary Sinus (CS). The procedure was aborted, and a Computed Tomography Angiogram (CTA) was done. CTA confirmed a PLSVC (**Figures 1-3**) and notably, no right RSVC was visualized. With this information, our patient later had the CRT-D successfully implanted via right axillary vein approach, with specially designed lead delivery catheters.

Discussion

Developmental Anomaly

Two pairs of cardinal veins, constituents of the embryological sinus venosus, constitute the primary source of embryonic systemic venous drainage. The anterior cardinal veins drain the cranial parts of the embryo, and the posterior cardinal veins drain the caudal parts. Both veins join to form the right and left common cardinal veins before entering the embryological heart. During the eighth week of fetal development, the innominate or left brachiocephalic vein connects the bilateral anterior cardinal veins. The caudal portions of the right anterior and right common cardinal vein form the right SVC. Part of the left anterior cardinal vein, caudal to the innominate vein regresses forming the ligament of Marshall. When this regression fails to happen, and the left anterior vein continues to drain the left brachiocephalic veins, a PLSVC results.² If the right anterior cardinal vein degenerates instead of forming the right SVC, blood from the right side is carried by the brachiocephalic vein to the PLSVC.⁴ PLSVC is associated with the absence of innominate vein in 65% of cases.⁵

Diagnosis

Multiple non-invasive modalities including chest X-ray, echocardiography, Computed Tomography Angiography (CTA) and Magnetic Resonance Venography (MRV) can be used in the diagnosis of PLSVC.² However, as most patients are asymptomatic, isolated PLSVC is most commonly detected when technical difficulties are faced accessing the right ventricle via a left-sided vascular approach.

As in our case, CTA is an excellent modality for the diagnosis of PLSVC as it not only allows for detecting PLSVC but also allows for visualization of the exact course or site of connection of PLSVC with the cardiac chambers. Though non-enhanced CT can also be used to diagnose PLSVC, CTA has a superior advantage, especially when dedicated protocols for optimum enhancement of the SVC and CS are used. Routine contrast-

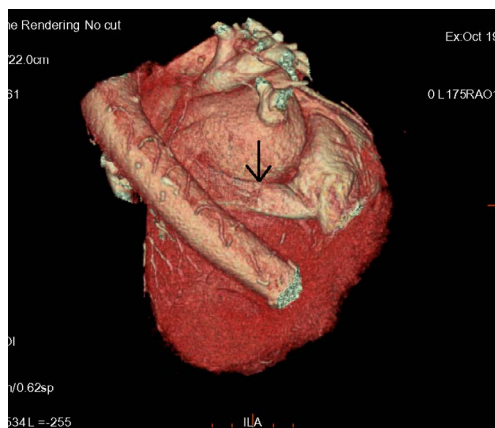


FIGURE 1 CTA imaging showing PLSVC highlighted by the arrow

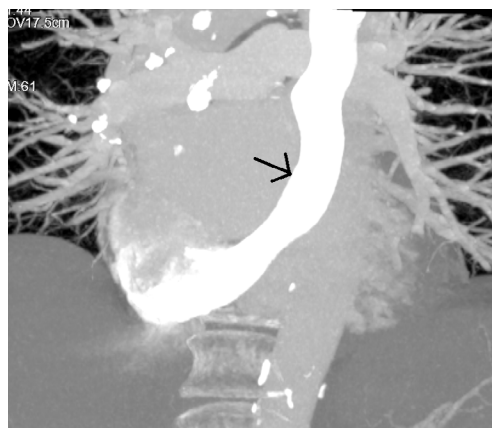


FIGURE 2 CTA imaging showing PLSVC highlighted by the arrow

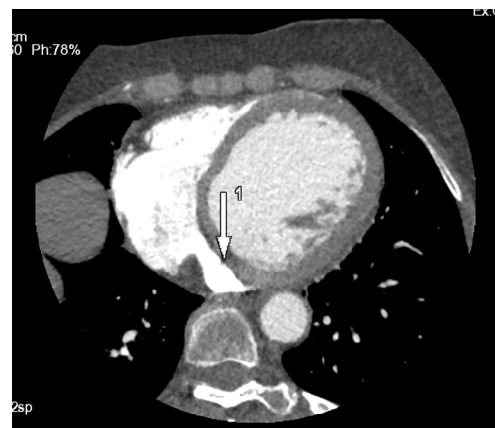


FIGURE 3 CTA imaging showing PLSVC highlighted by the arrow

enhanced ECG-gated cardiovascular CT performed three to five seconds after injecting the contrast agent into a peripheral vein, achieves excellent uniform enhancement of the SVC. Caudocranial image acquisition may be considered as the CS is inferiorly positioned. If multiphasic data are available, the systolic reconstruction phases (35%–45%) would also yield better coronary venous distention.⁶

Clinical Implications

As PLSVC is more common in patients with congenital cardiac malformations than in the general population, the presence of these anomalies should be looked for and appropriately addressed. Its association with atrial septal defects, bicuspid aortic valves or coarctation of the aorta in Turner syndrome, left isomerism of the heart, coronary sinus ostial atresia, tetralogy of Fallot, and several other malformations has been well-documented.^{2,4}

PLSVC can pose challenges during trans-venous procedures such as right heart catheterization, pacemaker implantation, Implantable Cardioverter Defibrillator (ICD) placement, and biventricular pacing.⁷ It can also complicate placement of central venous line and cardiopulmonary bypass in patients undergoing cardiac/thoracic surgery procedures.⁸ In these patients, complications such as shock, cardiac arrest or angina can manifest as a result of catheter manipulation in the coronary sinus and injury to the vessel wall.^{9,10} However, despite its anatomical changes, risks, and associated complications, PLSVC does not prevent successful pacemaker or ICD placement. Technical and technological advances have led to use of different approaches and specifically designed catheters for the necessary procedures in such cases.

Persistence of LSVC has also been described to cause small and poorly formed sinus node, fetal dispersion of the AV node and His bundle within the central fibrous body, small diameter of the His bundle, and poor arterial supply to either the AV node or the sinus node. This may predispose patients to arrhythmias and sudden death.¹⁰

Conclusion

Isolated PLSVC is a rare congenital anomaly which is typically asymptomatic and is most often discovered during central venous catheterization or pacemaker implantation. Cardiologists should consider the presence of a PLSVC when a catheter or guide wire inserted via the left subclavian approach makes an abnormal left-sided downward course. It must be confirmed with the use of imaging modalities like CTA which allows for accurate anatomical pictures, thus aiding the choice of invasive techniques needed for the procedure. Once identified, the presence of a PLSVC should be well-documented so that it can help overcome cardiac procedural challenges in the future.

Conflicts of interest: None

Patient Permission

The patient provided permission for her medical records to be used for the purpose of a case report.

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Director Congenital Cardiac ICU Care

Cedars-Sinai Medical Center, one of the nation's leading academic medical center, has begun a unique congenital heart program focused on providing seamless continuous care for congenital heart patients from conception through senescence by one integrated, subspecialized team. The Guerin Family Congenital Heart Program (CHP), housed within the Smidt Heart Institute is a joint venture between the Heart Institute, the Department of Pediatrics, the Department of Cardiac Surgery, the Department of Cardiology and the new Cedars-Sinai Guerin Children's is seeking a **Director of Congenital Cardiac ICU Care**.

Cedars Sinai has the largest delivery service in Los Angeles with over 6000 births per year as well as a 45 bed Level 4 NICU, a 12-bed combined pediatric and congenital cardiac intensive care unit and a new state of art pediatric medical-surgical unit. Currently the ICU is staffed by 8 attending pediatric intensivists, many with extensive cardiac experience. The full complement of cardiac diagnostic testing is readily available, as are the latest advances in catheter-based interventions and surgical procedures. The new Director will work closely with other program leaders to further develop the program to its full potential.

The identified candidate will provide senior administrative leadership in the cardiac ICU working in close collaboration with senior CHP and PICU leadership to create and implement a unique common vision for the CICU. The candidate will provide clinical expertise on all cardiac cases in the ICU.

The candidate must be board-certified in pediatric ICU and/or pediatric cardiology with a minimum of five years working as an attending level pediatric cardiac intensivist and must possess or be able to obtain a valid, non-restrictive California Medical License. The successful candidate must have a strong commitment to clinical excellence, academic medicine and teaching. Finally, the candidate must be passionate about their work and fully engaged in programmatic design and growth.

Cedars-Sinai Medical Center, a state-of-the-art, 958 bed tertiary acute care academic medical center is committed to excellence in compassionate patient care, research, education, and community programs to improve the lives of our patients. Academic rank and compensation will be commensurate with experience and qualifications. If you are interested in joining a flourishing clinical, academic and research environment in a growing medical center, please send your curriculum vitae in confidence to:

Please submit CV and cover letter to:
Evan Zahn, MD, Director, Guerin Family Congenital Heart Program
<http://apply.interfolio.com/110217>

At Cedars-Sinai Medical Center we are proud of our diverse team and inclusive work environment. We are committed to recruiting, selecting and retaining an engaged workforce from many backgrounds, perspectives and experiences at all levels of the organization, including age, gender identity, race, religion, gender, sexual orientation, physical or mental disability, military and/or veteran status or any other basis protected by federal and state law.

Our Compensation Philosophy

We offer competitive total compensation that includes pay, benefits, and other incentive programs for our employees. The total pay range shown above takes into account the wide range of factors that are considered in making compensation decisions including knowledge/skills; relevant experience and training; education/certifications/licensure; and other business and organizational factors. This total pay range includes any incentive payments that may be applicable to this role. We also offer a comprehensive faculty benefits package.

Pay Range: \$388,639 - \$653,349 Total Cash Compensation



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Children's Mercy
KANSAS CITY

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/22690/physician/job>

For more information:

Aliessa Barnes MD
Co-Director, Ward Family Heart Center; Chief, Section of Cardiology
816.983.6225, apbarnes@cmh.edu

For more information about Children's Mercy Kansas City and about Kansas City itself, visit cmkc.link/TakeYourPlace.



Excellent Opportunity for an Adult Cardiologist with Congenital Heart Disease Training at Children's Hospital of Michigan

Children's Hospital of Michigan is the leader in treating the most children and adults with congenital heart disease (CHD) for cardiovascular care in the Metropolitan Detroit area. We have a large volume of adult patients with CHD (ACHD) supported with certified cardiologists in ACHD, two cardiac surgeons who perform surgery, interventional and EP cardiologists who perform procedures in these patients. We are in the process of certification for the center of excellence for the ACHD at Children's Hospital of Michigan. With an extensive team of attendings and a dedicated nursing staff, the Pediatric Cardiologists and Pediatric Cardiovascular surgeons at Children's Hospital of Michigan provides a full range of advanced cardiac services for newborns, infants, children, and adolescents with congenital or acquired heart disease, and for adults with congenital heart disease.

The Cardiology and Heart Surgery programs at Children's Hospital of Michigan are ranked among the U.S. News & World Report's 2021-2022 Best Children's Hospitals. Our program is also designated as one of two UNOS certified cardiac transplant centers in the state of Michigan.

We are actively seeking an additional cardiologist with training/experience to join our robust program to participate in the care of the burgeoning ACHD patients.

- Full-time, employed opportunity – Available immediately
- On service 4 weeks per year (Cardiology service)
- Work week is flexible and comprised of 2 days of clinic, 1 day in the cath lab if eligible, and 1 administrative day; teaching required
- Dedicated nursing staff of five with one that is designated for ACHD, and additional for cath/EP
- Academic appointment through Central Michigan University
- Affiliation with Central Michigan University, Michigan State University, and Wayne State University School of Medicine for collaboration in teaching and research

Candidate Requirements

- MD or DO degree required
- Board certification required
- At least 1 year of advanced fellowship training in ACHD
- Ability to obtain licensure in the State of Michigan
- An interest in teaching and research highly preferred as resident/fellow teaching is to be expected

About Children's Hospital of Michigan

Since 1886, the Children's Hospital of Michigan has been dedicated to providing the highest quality medical care to children and adolescents in a caring, efficient, and family-centered environment. A proud member of the Detroit Medical Center, the Children's Hospital of Michigan is the first and most experienced pediatric specialty hospital in the state and is internationally recognized for more than 40 pediatric medical and surgical specialties/services that it offers.

The Children's Hospital of Michigan has 228 licensed beds and is staffed by more than 2,000 employees. It has 517 physicians on the medical staff, including 323 pediatric specialists, and 680 pediatric-trained nurses. Of the 517 physicians on the medical staff, 185 are Wayne State University faculty physicians employed by University Pediatricians. The majority of the remaining physicians are in other smaller practice groups or are independent, with the exception of a small number of employed gastroenterologists, urologists, and surgeons.

The Department of Pediatrics at Wayne State University School of Medicine supports the teaching of residents, specialists, fellows, and medical students in training. More Michigan pediatricians are trained at Children's Hospital than at any other hospital in the state. Children's Hospital of Michigan is the third largest recipient of Children's Education funding in the country, which equates to \$13 million annually. Ground breaking clinical, translational, and basic science research is also a major focus for the medical staff at the Hospital.

The combination of outstanding, high quality clinical care, teaching, and research has earned the Children's Hospital of Michigan to be ranked among the best in the country in eight pediatric specialties according to U.S. News & World Report's 2015-16 Best Children's Hospitals rankings. The Children's Hospital of Michigan is nationally ranked in Cardiology and Heart Surgery (#37), Nephrology (#41), Neurology and Neurosurgery (#24), and Orthopedisc.

Children's Hospital of Michigan includes an American College of Surgeons verified, freestanding Level I Pediatric Trauma Center and verified pediatric burn center. The hospital provides exceptional care, around the clock, to injured children and families from time of injury through recovery and rehabilitation. When pediatric patients need emergency transport, Children's Hospital of Michigan's PANDA One provides a dedicated pediatric and neonatal ambulance service and team. Children's Hospital of Michigan's emergency departments see 90,00 children each year.

How to Apply

If interested, please submit a copy of your current CV and contact information for immediate consideration.

All inquiries and personal information are kept confidential.

Contact: Wendy Castaldo, 937.214.9317, Wendy.Castaldo@tenethealth.com



“An Intellectual Feast”

PICS LIVE 2023 and the 8th World Congress

August 27th – September 1st, Washington, DC

The PICS Society Center for Continuing Education

Following last year's 25th Anniversary *PICS Symposium* in Chicago, this August we will start our next quarter-century with an even more special event: *PICS LIVE* will be held concurrently with the *World Congress of Pediatric Cardiology & Cardiac Surgery (WCPCCS)* in Washington, DC. Traditionally held every four years, the *World Congress* is a meeting of unparalleled depth, scope and size in pediatric cardiology/cardiac surgery. This year *PICS LIVE* will focus each morning with the live cases that *PICS* is renowned for, while enabling *PICS LIVE* attendees full access to the incredible programming of the entire *World Congress*.

We recently interviewed Drs. Ziyad M. Hijazi, MPH, FPICS (*PICS* President) and Damien Kenny, FPICS (*PICS Live* Chair and *PICS* Vice President) about plans for *PICS Live*. We also received invaluable information from the *WCPCCS* leadership. Highlights:

Is *PICS Live* in effect this year's version of the annual *PICS Symposium*?

Dr. Hijazi: Yes! The only major difference: This year we are doing it alongside the *World Congress*, so that those who come to Washington DC will have a “two for one” experience. Each morning attendees can attend our live cases; we call this “*PICS Live*.” Each afternoon, attendees will attend any *World Congress* events they choose, whether those events focus on interventional treatment of CHD (which *PICS* faculty will be deeply involved with) or any of the dozens of other events offered daily. So in that sense this is a two-for-one week. That's why we call this an intellectual feast!

How do people register, submit abstracts, book hotel rooms, plan each day?

Dr. Kenny: We are working with the *World Congress* staff to make this all very user-friendly, focusing on “one-stop shopping.” Simply go to wcpccs2023.org where you will find links for everything you need. Register for the *World Congress*, then for a modest additional fee on the registration page you can sign up for *PICS Live* as well—easily AND affordably! Even better: the total cost of both *PICS Live* and the *World Congress* is very similar to previous *PICS* meetings.

“The best of two worlds”

Dr. Hijazi: *PICS Live*, although an independent meeting designed by the *PICS* Society, will occur 8:00 am to 12:30 pm Monday through Thursday during the *World Congress*. The live cases will take place at the Marriott Marquis, footsteps from the Washington DC Convention Center. *PICS Live* attendees will enjoy continuous live case transmission from at least ten cardiac centers in the US, Europe, the Middle East, Asia and South America. Master operators will treat CHD conditions involving percutaneous valves, stent implantation devices, closure of septal defects, balloon angioplasty and other situations. As in previous years, panels at *PICS Live* will provide expert commentary, with time reserved for audience Q & A.

All afternoon sessions will be held in the Convention Center focusing on didactic sessions, seminars and workshops in our specialty, as well as opportunities for you to network - and learn - with our colleagues from many other fields. Sessions will cover: advanced imaging, nursing/technologist science, heart failure, surgery, anesthesiology, adult CHD, intensive care, cardiovascular disease in the neonate and many other areas.

Dr. Kenny: The lynchpin of *PICS Live* will be live case demonstrations from around the world. Seeing how teams perform procedures provides an

invaluable educational benefit. We will also have taped moderated cases with instructor/ attendee interaction. *PICS Live* will provide many hours of CME, very important for board certification or recertification and, of course, for one's own professional development.

Tell us more about this year's topics of special focus

Dr. Hijazi: We will cover interventions for CHD both in the live cases and in collaborative sessions with other societies in the Main Convention Center: septal defects (ASD closure, VSD closure, PDA closure), procedures for premature infants and fetal patients, adult CHD, advanced imaging, anesthesia, rheumatic fever, neonatology, hybrid surgical/interventional procedures, lymphatics and others. Advances in artificial intelligence and simulation technologies are of growing focus as well. The *PICS Society* will proudly collaborate with other societies such as the *International Society for Adult Congenital Heart Disease*, the *Congenital Cardiac Anesthesia Society*, the *Fetal Heart Society*, the *Neonatal Heart Society*, the *World Society for Pediatric and Congenital Heart Surgeons* and others.

Also this year we will have a session on quality, an extraordinarily important area. Everyone in our field knows the basics, so we will focus laser-like on quality in all of its aspects: outcomes, patient satisfaction, infection prevention, patient selection, guidelines-based care, interdisciplinary teamwork, and so much more. Dr. Ralf Holzer, who chairs the *PICS* Quality Improvement Committee, will lead a session on this vital topic. **News flash:** during the meeting, the *PICS Society* will also announce a major initiative in this area—details soon!

What additional programming will be offered?

Dr. Kenny: Advances in imaging are occurring daily. To help us keep up, Drs. Aimee Armstrong and Gregor Krings will again offer the 3Di3 Advanced Imaging program providing the latest ‘news you can use’ in this vital area. As mentioned earlier, there will be many events for our nursing and technologist colleagues, as well as programs for early career interventionalists. Drs. Vivian Dimas and Gareth Morgan will chair our two-day Fellows and Early Career Course (FECC), our highly popular program (apply early: space is limited). Additionally, the first-of-its-kind “Multidimensional Anatomy Lab” will be open throughout the meeting, ranging from traditional anatomic specimens, through angiography, echocardiography, 3D and 4D imaging, and virtual reality. This hands-on experience will provide an incredible opportunity for interventionalists to grasp the subtleties of anatomic variation in CHD.

Tell us about the venue itself

Dr. Hijazi: Washington, DC is an amazing international city for the entire family. DC is served by three international airports with scores of direct flights daily. As the capitol city of the U.S., you and your family can experience a week-long living history lesson, where you can visit the Smithsonian's huge collection of free museums (the largest on the planet), view Capitol Hill and the White House, and sample restaurants of all types. If you are visiting from outside the U.S., contact our staff to learn about policies for visiting your nation's embassy.

Opportunities to interact with industry partners

Dr. Kenny: The *World Congress*' exhibition hall will be huge! Industry will display the latest products and the tried-and-true. Everything will be on display, with those who developed these products available for discussion.



Industry demonstrations in the exhibit hall and expert presentations during industry symposia will focus on advances in imaging and new interventional devices.

This is crucial. CEO's and their representatives will be there to learn our needs. Take time to introduce yourself, interact, learn and avail yourself of opportunities for hands – on demonstrations. The relationship between industry and medical professionals is extremely important: We clinicians have the ideas about what we need to better treat patients. Industry has the engineers, the scientists and the resources to meet those needs.

Information & Dates to Remember

- **World Congress 2023: August 27th – September 1st, Washington, DC**
- **PICS Live: August 28th – 31st**
- **Registration & accommodations for PICS Live and the World Congress: wcpccs2023.org**
- **PICS Live website: CHDinterventions.org**
 - Abstracts: submit to wcpccs2023.org
 - Presentation formats: For consideration submit by May 15th
 - Posters: For consideration submit between May 16th – June 30th
- **PICS 3Di3 Advanced Imaging Program: details at CHDinterventions.org**
- **PICS Fellows & Early Career Course: Apply at CHDinterventions.org**

More About the World Congress

Traditionally held every four years, the *World Congress* is a large international meeting of unparalleled depth, scope and size, affectionately known as “The Olympics of our Profession.” Inspired by the incredible precedent set by past *World Congress* organizers, our goal is to make this the most comprehensive, up-to-date, and technologically advanced meeting for Pediatric and Congenital Heart Disease.

In addition to the collaboration with *PICS*, the *WCPCCS* features:

- ~2300 Talks in ~170 Sessions, with ~1000 Faculty across 22 Tracks
 - Emphasis on diversity in faculty – geographic, gender, age and race
 - Besides *PICS*, 14 additional societies and post-graduate courses have cancelled their annual meeting and have embedded scientific content in the *World Congress*
 - Healthcare professionals from all disciplines can customize their learning experience based on their own needs
- 16 Featured Landmark Lectures
- ~1500 Abstracts of New Science will be Submitted from Around the World
 - Best Abstract Competition
- 17 different track winners, including *PICS**, will compete for the Best Abstract of the Congress

- Multi-dimensional Anatomy Lab – First of its kind
- Digital Futures Hub – First of its kind
- “Trainee and Early Career Track” Throughout the Meeting
- Global Health and Advocacy Village
 - A collection of over 125 NGOs and Patient/Parent Advocacy will share their Visions and Missions from around the world
 - Creation of Enduring Materials, White Papers, and Scientific Statements
- The *WCPCCS* has garnered International support from the *Association of European Cardiologists*, *Cardiac Society of Australia and New Zealand*, *Pediatric Cardiology Society of India*, and *Global Alliance for Rheumatic and Congenital Heart Disease*

*Abstracts should be submitted specifically for the Catheterization Track, and accepted abstracts will be presented as either oral or poster presentations. The winner of the “Best Catheterization Abstract” will also compete with the top abstracts of 16 other tracks for the Best Abstract of the 8th *World Congress* Award. For information regarding abstract submission, visit: <https://www.wcpccs2023.org/event/1da8563e-0f65-486c-88df-70c3db431af5/websitePage:839641f8-d609-4fea-8e22-bfa63439f918>

Organizations from across North America have come together to make this *World Congress* a momentous event. We are honored by the groundswell of support from these organizations. More than 60 children’s hospitals across North America have joined the effort as Institutional Partners, plus over 50 international associations and related organizations have provided endorsements for this *World Congress*. See you in Washington, DC!



Join the

PICS Society

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THE OHIO STATE UNIVERSITY
COLLEGE OF MEDICINE

General Pediatric Cardiologist

The Heart Center at Nationwide Children's Hospital (NCH) in conjunction with The Ohio State University Department of Pediatrics in Columbus, Ohio seeks a general pediatric cardiologist, at any academic level, to join its growing and dynamic program.

Candidates should be board-certified or eligible in pediatric cardiology. Clinical responsibilities will include general outpatient cardiology, participation on the in-patient cardiology consultation service, and general cardiology night call. Other clinical interests may be explored.

The successful applicant will join our Heart Center team which currently includes 50 attending physicians and 33 advanced practice providers. The Heart Center is a dedicated hospital service-line that carries the mission of providing state-of-the-art, cost-effective care to our patients with congenital and acquired heart disease regardless of age. The Heart Center has over 20,000 outpatient encounters per year, including specialty and multispecialty clinics, and performs over 450 cardiothoracic surgical procedures and 700 cardiac catheterizations yearly. Comprehensive services include a single ventricle program, thoracic organ transplantation, blood conservation strategies, fetal cardiac intervention, a leading adult congenital cardiology service, and a robust mechanical cardiac and pulmonary support program. Outpatient services are provided on the main campus, Close-to-Home locations, and regionally at 10 sites throughout the state.

The applicant will be expected to teach and mentor fellows and trainees. The program includes advanced (4th year) fellowships in Advanced Noninvasive Cardiac Imaging, Interventional Cardiology, Acute Care Cardiology and Heart Failure/Transplantation in addition to the core categorical pediatric cardiology and combined pediatric-adult cardiology fellowship programs. Academic productivity is an expectation. Our program is closely partnered with the Center for Cardiovascular Research which provides infrastructure to support the clinical research enterprise, with opportunities to collaborate with additional research centers within the Abigail Wexner Research Institute at NCH. 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 embraces a culture of patient safety and quality, transparency, value-based care, public health awareness, excellence in education and engagement in translational/ outcomes research. Named to the Top 10 Honor Roll on *U.S. News & World Report's* 2022-23 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 physicians train the next generation of pediatricians and pediatric specialists. The Abigail Wexner Research Institute at 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](https://www.nationwidechildrens.org). Columbus is the state capital and the 14th most populous city in the US (metropolitan population just over 2 million). It is a diverse community with excellent schools, a thriving economy, and a vibrant arts/food scene.

Candidates are encouraged to submit their curriculum vitae by email to:

Robert Gajarski, MD, MHSA

Cardiology Section Chief

Robert.Gajarski@NationwideChildrens.org

*The Ohio State University is an Equal Opportunity, Affirmative Action Employer.
Women, minorities, veterans, and individuals with disabilities are encouraged to apply.*



Preview of PDA Stenting in Cyanotic Newborns: Comprehensive Management Strategies from Fetus to Toddler – First Annual PDA Stenting Symposium

Howaida El Said, MD, PhD; Jeanne Carroll, MD; Brent Gordon, MD; David Werho, MD; Brian T. Allison, FACHE

It started with a dream carried through the years by many giants. First John Moore started the experiment in lambs in 1990,¹ then Gibbs had the courage to perform the procedure on a couple of infants in 1992.² It wasn't until coronary stent technology advanced that Alwi Mazni adapted it for infants in Malaysia that were unable to get a Blalock-Thomas-Taussig (BTT) shunt.³ While surgical shunts were a breakthrough in establishing adequate pulmonary blood flow that allowed cyanotic infants to survive, the mortality associated with a BTT remains anywhere from 10-30%.⁴ While that was tolerable when the mortality without surgery was 100%, it is less desirable in the current era of excellent outcomes and data transparency.

One building block after the other and here we are with many centers adopting it as the primary procedure and some performing ductal stenting for all cyanotic infants.⁵ The procedure seems simple, but it is far from that. It is risky and tedious and deserves respect. An excellent procedure in the lab and you can have a baby eating the same day and home the next: one mistake and you may not have a survivor. The learning curve is steep, and one can never let their guard down.

Each PDA is unique. It may arise from the descending aorta, the innominate artery, or the under-surface of the arch. Access must be meticulously thought out. Femoral, carotid, axillary, or umbilical? Each has its time and place with pros and cons for each.⁶ CT imaging and 3D modeling facilitate planning the procedure including stent length and vascular approach (Figure 1).⁷

Who should have a PDA stent? Patients with dual-source or single sources of pulmonary blood flow? Single ventricle or two ventricles? Is one of the branch pulmonary arteries going to get isolated? Is the bronchus going to get compressed?⁸⁻¹³

Finally, sizing the PDA stent is an art. What diameter? What length? One stent or two? Many have adopted a philosophy of "better too long than too short" to avoid leaving the aortic or pulmonary artery end(s) uncovered. But then there are reports about injury of the back of the aorta if the stent is too long. Bioengineers are tirelessly working on helping us understand the

mechanics and dynamics of the stent interaction with the protean PDA shape and size, but this remains one of the many challenges of the procedure.

After stent implantation, what is the post procedure course? Which anticoagulants are best? How should we monitor these patients at home? When should they have their next surgery? Should you re-dilate the stent? How do you remove the stent at the time of surgery and can the procedure be done off pump? What will the COMPASS trial teach us? Finally, will stenting improve neurodevelopmental outcomes?

So many questions and too many "answers"!?!?!?

We felt that this very important procedure deserved its own meeting and cordially invite you to attend the inaugural PDA Stenting Symposium in San Diego, on April 20th-22nd, 2023. We have developed a collaborative, multidisciplinary Conference that has been carefully designed to provide an innovative and comprehensive overview of the latest developments and outcomes for PDA stenting in infants with cyanotic congenital heart disease. Many distinguished intensivists, neonatologists, cardiothoracic surgeons, developmental pediatricians, and cardiologists have joined the faculty and will take part in this conference, with the common goal to advance the field and reinforce lasting partnerships across specialties of those who care for these fragile and complex patients via lectures, case discussions, and taped cases.

The Conference will be hosted at the Loews Coronado, providing the ultimate opportunity for learning, sharing, networking and professional socializing while enjoying stunning views from its prime beachfront location. San Diego is world-renowned for its fantastic year-round climate, award-winning restaurants, and abundance of readily accessible outdoor activities. What better way to spend a long weekend than diving into PDA stenting and enjoying all that San Diego can offer in the Spring?

The Conference will be available in person and live Zoom. To register, please visit <https://web.cvent.com/event/1df624a5-3218-4c2e-81e4-807df87f5471/summary>

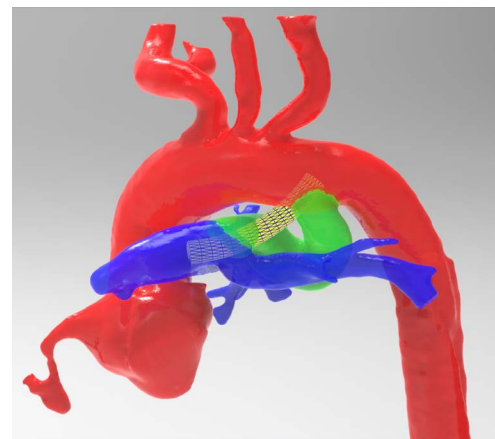
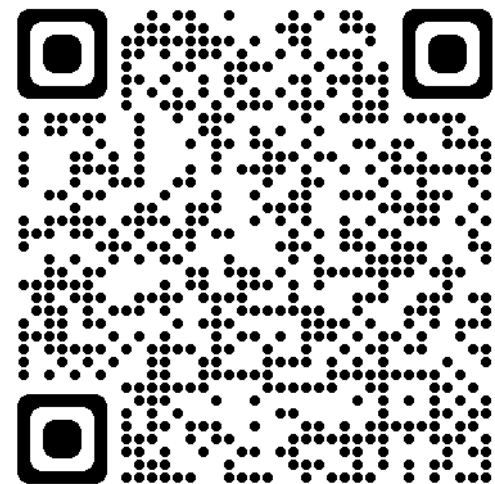


FIGURE 1 3D reconstruction demonstrating simulation of PDA stent by the Helen and Will Webster Foundation 3D Innovations Lab at Rady Children's Hospital



Scan or click to visit the PDA Stenting website

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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 ([USNR 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://pdc.dukehealth.org/physician-jobs>

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.

Duke is an Affirmative Action/Equal Opportunity Employer committed to providing employment without regard to an individual's age, color, disability, gender, gender expression, gender identity, genetic information, national origin, race, religion, sex, sexual orientation, or veteran status.

Contact Info:

Sherron Basnight, Physician Recruiter
sherron.basnight@duke.edu



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Two Full-Time Ambulatory Pediatric Cardiologists

Inova LJ Murphy Children's Hospital is seeking **two full-time ambulatory pediatric cardiologists** to support our rapidly growing team within Inova Children's Heart Center.

Responsibilities and Practice Details:

- The Division of Pediatric Cardiology includes 20 board-certified pediatric cardiologists and 5 advanced practice providers. Inova Children's Heart Center is a comprehensive team, including congenital cardiac surgery, outpatient cardiology, fetal cardiology, non-invasive cardiology, adult congenital cardiology, fetal cardiology, diagnostic and interventional catheterization, and electrophysiology.
- The candidate should have a passion for advanced training in non-invasive imaging while possessing professional, clinical, and leadership skills.
- Responsibilities will include a mix of outpatient general pediatric cardiology and inpatient service, including Cardiology Ward/Consult service and/or Cardiology Stepdown team.
- One individual will largely but not exclusively work in our Leesburg/Gainesville region.
- One individual will largely but not exclusively work in the Winchester region.
- Flexibility, strong communication and collaborative skills are key.
- This position will work with the Chief of Pediatric Cardiology and the leadership of the Inova Children's Heart Center to execute on yearly personal and programmatic goals focused on the fundamentals of extraordinary care: Safety, quality, patient experiences, access, and stewardship.
- This is a perfect position for the candidate that thrives in an environment that focuses on teamwork, collaboration and dedication to patients, families, and each other.
- Although patient care is our primary focus, education and research are also encouraged and supported with access to dedicated research professionals including a statistician, research manager, and research coordinators.

Position Highlights:

- Highly competitive salary with incentives
- Full Medical, dental and vision
- Generous PTO and paid time to attend CME
- Paid Parental Leave Program
- Located Northern Virginia

Inova LJ Murphy Children's Hospital is a 226-bed children's hospital at Inova Fairfax Hospital medical campus, located in Northern Virginia. As the only dedicated children's hospital in Northern Virginia, we provide care in a welcoming environment that offers the latest in technical innovation in kid-friendly spaces. Other features of our hospital include:

- 108-bed, level IV Neonatal Intensive Care Unit
- Pediatric Intensive Care Unit and Pediatric Cardiac Intensive Care Unit
- Inova Children's Cancer Center
- Level One Trauma Center
- Complex pediatric care across a spectrum of specialties
- Pediatric Emergency Department and network of pediatric emergency care seeing over 100,000 patients annually
- Child Life Services dedicated in each inpatient space and outpatient procedural area
- Specialized air and ground transport service
- Ronald McDonald House

Requirements:

- Board-certified/eligible in Pediatric Cardiology
- Interested individuals should be board-certified in Pediatric Cardiology and able to obtain an unrestricted Virginia Medical License.
- Eligible for faculty appointment at The University of Virginia School of Medicine

Interested Candidates should reach out to:
Mitchell Cohen, MD, FACC, FHRS
Chief of Pediatric Cardiology, Co-Director of the Children's Heart Center
Mitchell.cohen@inova.org



An Overview of ACTION – The Advanced Cardiac Therapies Improving Outcomes Network

Angela Lorts, MD, MBA, Co-Executive Director ACTION & Lauren Smyth, MHA, Director, Operations, ACTION

The Need is Clear: Patients Need Better Care & Outcomes

Heart failure is a leading cause of death, heart transplantation and functional decline among children and adults with complex congenital and acquired forms of heart disease. More than 14,000 hospitalizations related to pediatric heart failure occur annually in the United States alone.¹

Additionally, research for pediatric heart failure is underfunded, and cardiac devices and medicines are not developed specifically for children. Barriers to developing therapies for pediatrics include relatively small patient numbers, lack of economic incentive, burden of data collection, and suboptimal awareness of the problem. Heart failure care delivery in pediatrics also varies greatly, and patients experience a wide range of outcomes depending on where they live. This leads to an increase in mortality, hospitalizations, and adverse events. The need is clear: our patients need better care and better outcomes.

A Solution: ACTION

In 2017, we created a pediatric and adult Congenital Heart Disease learning health network to overcome these barriers and challenges.² **ACTION** (the Advanced Cardiac Therapies Improving Outcomes Network) unites and connects our global healthcare community to improve outcomes for patients with heart failure. We bring patients, caregivers, providers, institutions, research, technology, regulatory bodies and industry together. By building this cohesive community with all stakeholders, we bring new technologies to pediatrics, we are cost efficient while being effective, and we focus

on the outcomes that matter. To date, we have 60 member centers in North America, and engagement with institutions in eight countries.

Initiatives

ACTION initiatives have included planning and implementation of quality improvement projects, data collection, education and program material development, and much more. Discovery and improvement are often limited by small numbers of patients at any one care center; the open communication and transparency of outcomes between our members inspire inventive thinking and evidence-based practices to enhance standards of care and improve patient outcomes. Our network serves patients with Cardiomyopathy, Congenital Heart Disease, Ventricular Assist Device (VAD), Muscular Dystrophy, and Pediatric & Adult Fontan circulatory failure.

Data & Registries

Our data & registries form the basis for all projects across the network. We are aiming to have the most reliable pediatric heart failure data at the lowest cost. Currently we adjudicate our site data and adverse events, link to other data sources, format for use as Real World Data, collect patient reported outcomes data, and use data to determine network priorities. In 2020, the ACTION VAD registry was successfully used for an expansion of the Abbott HeartMate 3 LVAD FDA label to include pediatrics. In November 2022, we launched the first VAD prospective trial using the ACTION registry, the Berlin Heart Active Driver trial.

Outcomes

Our work has led to a decrease in adverse events. Our first quality improvement project focused on reducing stroke rates for VAD patients. In 2017, approximately 30% of all children supported on Berlin Heart were suffering from a stroke event. We rolled out a bundle of interventions that included a change in the anticoagulation strategy, standardization of blood pressure measurement and innovative rounding strategies.³ By implementing this bundle, the stroke rate for Berlin Heart patients is now 13%, overall VAD stroke rates have been reduced by 50%, and more lives are being saved by more devices being implanted. See Figure 1.

Education

Education for patients, families and providers has been a primary focus for ACTION. In the past, there was a paucity of pediatric-specific VAD educational materials. We are developing patient and provider-facing education materials, such as handbooks, infographics, videos, animations, and a video game, all delivered on an eLearning site: myACTIONeducation.org. We now have the framework to expand education materials to other patient populations. We will continue to create education materials as more medications and devices are approved for pediatric use.

Research & Trials

In more recent endeavors, ACTION has been focused on prospective device trials. After the expanded FDA label was obtained for the HeartMate 3 LVAD (press release available

ACTION in MOTION – What we are Accomplishing



ADVANCED CARDIAC THERAPIES
IMPROVING OUTCOMES NETWORK

60+
North American
Network Sites



Countries
represented
8



1,158+
Network members



10
Network-wide
initiatives



22
Manuscripts
published



40+
Abstracts
accepted



35+
Harmonized
Protocols



Medical Director of Non-Invasive Cardiovascular Imaging

Inova LJ Murphy Children's Hospital is seeking a full-time pediatric cardiologist to serve as **Medical Director of Non-Invasive Cardiovascular Imaging** to support our rapidly growing team within Inova Children's Heart Center.

Responsibilities and Practice Details:

- The Division of Pediatric Cardiology includes 22 board-certified pediatric cardiologists and 5 advanced practice providers.
- Inova Children's Heart Center is a comprehensive team, including congenital cardiac surgery, outpatient cardiology, fetal cardiology, non-invasive cardiology, adult congenital cardiology, fetal cardiology, diagnostic and interventional catheterization, and electrophysiology.
- With respect to non-invasive imaging, the division currently performs fetal, transthoracic, and transesophageal echocardiography, and partners with radiology on cMRI and CT scans. A team of inpatient and outpatient dedicated congenital sonographers support the division.
- Routine patient care will include outpatient clinic, inpatient consultation, supervision of advanced practice providers, and hospital service.
- The candidate should have advanced training in non-invasive imaging while possessing professional, clinical, and leadership skills.
- This position will work with the Chief of Pediatric Cardiology and the leadership of the Inova Children's Heart Center to execute on yearly personal and programmatic goals focused on the fundamentals of extraordinary care: Safety, quality, patient experiences, access, and stewardship.
- This is a perfect position for the candidate that thrives in an environment that focuses on teamwork, collaboration and dedication to patients, families, and each other.
- Although patient care is our primary focus, education and research are also encouraged and supported with access to dedicated research professionals including a statistician, research manager, and research coordinators.

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- Level One Trauma Center
- Complex pediatric care across a spectrum of specialties
- Pediatric Emergency Department and network of pediatric emergency care seeing over 100,000 patients annually
- Child Life Services dedicated in each inpatient space and outpatient procedural area
- Specialized air and ground transport service
- Ronald McDonald House

Requirements:

- Board-certified/eligible in Pediatric Cardiology
- Interested individuals should be board-certified in Pediatric Cardiology and able to obtain an unrestricted Virginia Medical License.
- The ideal candidate will have extensive experience in the field, specifically in the area of echocardiography (TTE, TEE, etc).
- Preference will be given to those with experience at higher volume centers and demonstrated leadership roles in imaging.
- Additional preference will be given to those with previous experience or education in medical administration and those who have clinical research experience.
- Eligible for faculty appointment at The University of Virginia School of Medicine

Interested Candidates should reach out to:

Mitchell Cohen, MD, FACC, FHRS

Chief of Pediatric Cardiology, Co-Director of the Children's Heart Center

Mitchell.cohen@inova.org



Electronic delivery and collection of patient reported outcomes



a monitoring app with Apple Health

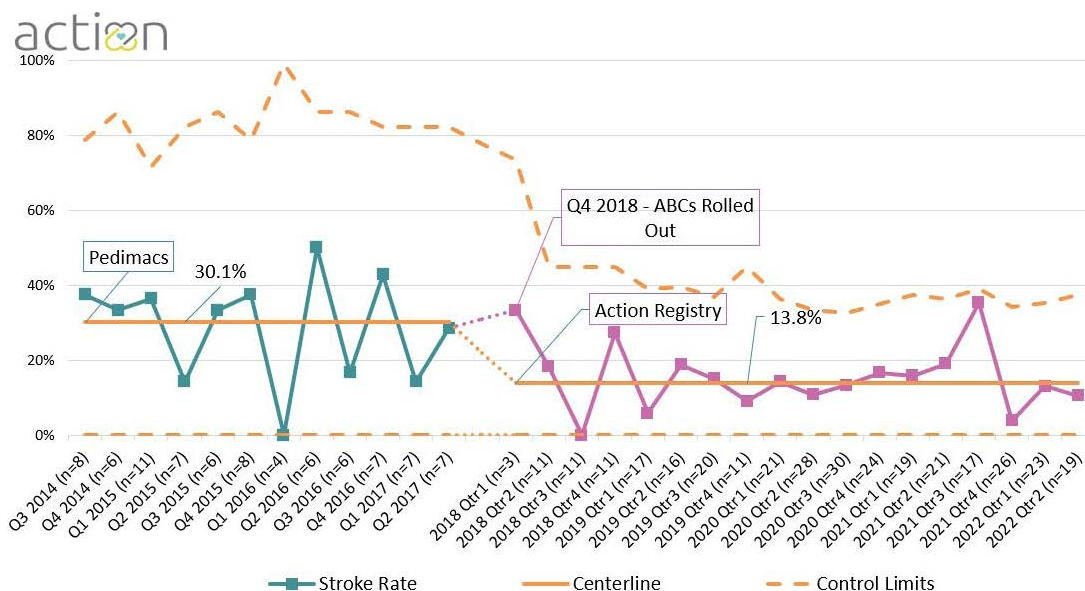


FIGURE 1 Stroke rates over time from 2014-2022

here), we have started to focus on a standard approach for future prospective trials. The first trial using this approach is the Berlin Heart Active Driver trial, actionlearningnetwork.org/our-trials/, and is being conducted through the learning network model. We have activated 13 sites and already enrolled 13 patients.

Innovation

Lastly, innovation in heart failure care is a core component of our network. In the past, we have had ineffective collection of patient reported outcomes, and no standard home monitoring with wearable technology. We are designing an electronic delivery and collection of patient-reported outcomes via iPad, email and text. Our pilot data has shown promising results for response rates in which 95% of surveys administered were completed.⁴ We have also created a monitoring application with Apple Health so physical functional observational data can be collected directly from wearables, such as heart rate, six-minute walk test, weight, sleep, etc. With these innovative projects, we will have insight into the outcomes that patients feel matter most and real-time data from patients while living outside of the hospital.

Impact

In the past six years, ACTION has made a significant impact on pediatric VAD and heart failure outcomes, but there's more work to be done. Our goals include further engagement and collaboration with other organizations, industry partners and international sites to further our mission. With further collaborations we can bring new treatment options to children in heart failure.

How You Can Help / Get Involved

We cannot do this work alone; we need your help. There are many opportunities to get involved with ACTION, including:

- Reaching out to our network to get involved
- Proposing a research or quality improvement idea
- Spreading educational materials from your center
- Bringing innovation to the multicenter collaborative

To learn more and to get involved, please reach out to info@actionlearningnetwork.org or go to actionlearningnetwork.org. To read more about ACTION's outcomes & research, please visit our publications page.

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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/22725/physician/job>

For more information:

Aliessa Barnes MD
Co-Director, Ward Family Heart Center; Chief, Section of Cardiology
816.983.6225, apbarnes@cmh.edu

For more information about Children's Mercy Kansas City and about Kansas City itself, visit cmkc.link/TakeYourPlace.

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

MAY

18-20

SCAI 2023 Scientific Sessions

Phoenix, AZ, USA

<https://scai.org/scai-2023-scientific-sessions>

JUNE

23-26

ASE 2023 – Foundations and the Future of Cardiovascular Ultrasound

National Harbor, MD, USA

<https://www.asescientificsessions.org/>

28-1

CSI Frankfurt

Frankfurt, Germany

<https://www.csi-congress.org/conferences-courses/conferences/csi-frankfurt>

JULY

28-29

CICT 2023 – CICT Controversies in Interventional Cardiovascular Therapies

Pasadena, CA, USA

<https://cictsymposium.com/>

AUGUST

27-01

8th World Congress of Pediatric Cardiology and Cardiac Surgery

Washington, DC, USA

<http://wcpccs2023.org/>



Adult Congenital Heart Disease Cardiologist

Accredited Adult Congenital Heart Center – Tampa Bay Florida

The **Tampa Bay Adult Congenital Heart Center** seeks to add a cardiologist specializing in adult congenital heart disease (ACHD). In addition to board certification in ACHD, the successful candidate will also need to maintain board certification in pediatric cardiology or adult cardiovascular diseases.

The **Tampa Bay Adult Congenital Heart Center** is accredited by the Adult Congenital Heart Association as a comprehensive adult congenital heart disease center. The center represents a 25-year collaboration between the following component stakeholders:

- Pediatric Cardiology Associates (affiliate of Pediatrix Medical Group). A group of 14 cardiologists including two ACHD cardiologists with offices throughout the Tampa Bay metropolitan area. Pediatrix will employ the newly recruited ACHD cardiologist. Pediatric Cardiology Associates also employs 3 advanced practice nurses with one serving the role of ACHD transition clinic coordinator.
- Florida Medical Clinic (independent medical group). This organization employs the third physician member of TBACH and offers Adult General Cardiology services in collaboration with our ACHD Center. This experienced Adult General Cardiologist is also board certified in ACHD.
- St. Joseph's Hospital (center's primary inpatient diagnosis and treatment venue). The hospital employs 2 full-time congenital heart surgeons, a dedicated congenital cardiac intensive care unit physician and advance practice nursing staff, 3 advanced practice nurses with one serving the role of primary ACHD advance practice nurse coordinator and supporting all ACHD clinical services including social work and case management.

Clinical responsibilities will include caring for ACHD patients in the outpatient and inpatient settings. An ACHD cardiologist who is board-certified in pediatric cardiology will also rotate on the general pediatric cardiology evening and weekend on-call schedule with 13 other pediatric cardiologists. An ACHD cardiologist who is board-certified in adult cardiovascular diseases will have the opportunity to care for adults with genetic cardiovascular diseases and aortopathy syndromes (e.g., hypertrophic cardiomyopathy, bicuspid aortic valve, Marfan syndrome and related conditions) who have been transitioned out of the pediatric cardiology clinic.

Teaching responsibilities may include participation in the didactic lectures or workshops for the University of South Florida Morsani College of Medicine's fellows in adult cardiovascular medicine, maternal-fetal medicine fellows, residents in pediatrics, medical students, and advance practice nursing students.

Tampa Bay's warm weather affords plenty of opportunities to relish the great outdoors year round. You will live in a region others only get to enjoy on vacation. Golf at one of nearly 100 courses or relax on one of the many pristine white-sand beaches. The area offers an assortment of family venues such as zoos, aquariums, theme parks, and state parks. Additionally Tampa Bay offers access to world-class museums, professional sporting events and the performing arts. There is a wide range of residential choices to fit every budget and lifestyle - whether you are looking for big city downtown living, golf course communities, waterfront lifestyle, majestic horse farms or historic neighborhoods.

Effective November 1st, 2021 Pediatrix will require all employees and new hires to be vaccinated against COVID-19, unless they qualify for an approved medical and/or religious exemption.

Benefits

Our clinicians enjoy a competitive compensation package with many locations offering sign on bonuses, relocation and tuition reimbursement. The compensation and benefits referenced is for illustrative purposes only, and will be discussed during and after the interview process.

*Our benefits include:

- Health (various options), life, vision, dental and disability insurance
- 401(k) with annual matching program
- Advanced and continuing medical education
- Leadership training and advancement opportunities
- Employee stock purchase plan at a 15% discount
- Professional liability insurance
- Support and payment for mandatory license/s and hospital credentialing

*These benefits are for full time employees, employees in other types of employment classifications may be eligible for some of these benefits.

Mednax, Inc. and its affiliated practices operating as Pediatrix® Medical Group (Pediatrix) are one of the nation's leading providers of highly specialized health care for women, babies and children. Since 1979, Pediatrix-affiliated clinicians have been committed to providing coordinated, compassionate and clinically excellent services across the continuum of care, both in hospital settings and office-based practices. Specialties including obstetrics, maternal-fetal medicine, and neonatology are complemented by 18 pediatric subspecialties and a newly expanded area of primary and urgent care clinics. The group's high-quality, evidence-based care is bolstered by investments in research, education, quality-improvement and safety initiatives.

Today through almost 8,000 employees in 38 states, dedicated teams including physicians, advanced practitioners, clinical leaders, business and operational experts work together every day to fulfill our mission to take great care of the patient®. We invite you to join the Pediatrix® family and help shape the future of health care for women, babies and children.

Pediatrix 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 or veteran status.



A Year Worth of ACTION

ACTION Looks Back at 2022 & Ahead to 2023

With the new year, the pediatric cardiology organization **ACTION** (the Advanced Cardiac Therapies Improving Outcomes Network), reflects on its accomplishments from 2022 and provides a view of what is to come in 2023.

ACTION's mission is to unite and connect the global healthcare community to improve outcomes for patients with heart failure, especially children.

"2022 was a tremendous, successful year for ACTION. We made great strides in improving outcomes for VAD, Heart Failure, Muscular Dystrophy and Fontan patients throughout 2022," said Angela Lorts, MD, MBA and Co-Executive Director of ACTION.

"As 2023 begins, we're already strategically planning to develop these four areas of ACTION further," continued Lorts. "Each focus area will have a registry for data collection, quality improvement initiatives, research, education, protocol harmonization efforts and innovation projects. We will also continue to develop our relationships with device and pharmaceutical companies and the FDA to better serve these orphan populations."

ACTION's 2022 Accomplishments

- **Apple Watch Study** – ACTION launched a first-of-its-kind Apple watch study for pediatric heart failure patients. Through an App built by the ACTION team, physical functional data is being collected to better understand heart failure patients on advanced cardiac therapies. The App collects data such as heart rate, six-minute walk tests, step count, weight and more.
- **Heart Failure Registry in ACTION** – successfully launched, it enables ACTION to do quality improvement, research and clinical trials for pediatric heart failure patients.
- **\$2 Million Grant from Parent Project Muscular Dystrophy (PPMD)** – in June 2022, ACTION was awarded a \$2 million grant from PPMD to expand muscular dystrophy focused research and quality improvement initiatives. PPMD's gift allows the expansion of ACTION's initiatives, including: MD database expansion; increase institution participation and ensure diverse representation; establish use of real-world data and prospective clinical trials for treatment of cardiac disease in muscular dystrophy; develop ACTION Patient Reported Outcomes (PRO); and develop educational modules for patients, caregivers and providers.
- **Ventricular Assist Device (VAD) Registry** – ACTION achieved a milestone of having 1,200 patients enter its VAD registry.
- **Berlin Heart Active Driver Trial** – launched its first prospective device trial, the Berlin Heart Active Driver Trial,

using its real-world data registry model.

- **In Real Life Educational Series** – embarked on a new education initiative for VAD patients with a two-day series titled, In Real Life, in which VAD providers were educated on real-life situations, scenarios and challenges.
- **Fontan Referral Care** – also became a more prominent focus for ACTION in 2022. It held a quality improvement design meeting in which it identified problems, barriers and potential interventions from its baseline data.
- **Manuscripts Published** – closing out 2022 academically, ACTION is proud of the 22 manuscripts it published as a network to date.

ACTION'S 2023 Look Ahead

2023 will be a busy year for ACTION. The organization looks head at the following activities:

- Completing enrollment in the Berlin Heart Active Driver Trial and identifying future trials for pediatric heart failure.
- Launching Fontan referral interventions and data collection, including the development of education for community providers and patients/families.
- Producing site-specific quality reports to improve data transparency and outcomes at the local level.
- Further collaboration with other mission-similar organizations.

To learn more about ACTION and how you could join its efforts, please visit actionlearningnetwork.org.

About ACTION

ACTION (the Advanced Cardiac Therapies Improving Outcomes Network) is an organization that unites and connects a global healthcare community to improve outcomes for patients with heart failure, especially children. Since 2017, ACTION has continued to grow and engage an international community by uniting key stakeholders: patients, families, clinicians, researchers, payors and industry.

Based in Cincinnati, OH, ACTION uses a quality improvement and research-based approach. ACTION works in collaboration with network sites and network members, sharing data, finding better solutions and discovering new innovations. Currently, there are 58 network sites and 1,185 network members. Learn more at actionlearningnetwork.org.



CHIP NETWORK
CONGENITAL HEART INTERNATIONAL PROFESSIONALS

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

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www.chip-network.org



Funded by Cincinnati Children's Heart Institute



General Pediatric Cardiologist

Successful Pediatric Cardiology Practice - Tropical Florida Coast

Pediatric Cardiology Associates, located in Tampa Bay on Florida's Gulf Coast, is seeking a board-certified or board-eligible General Pediatric Cardiologist, preferably with TEE and cardiac ICU experience.

- Ideally seeking candidates with TEE and cardiac ICU experience and at least 3 years of experience post-fellowship
- Large, experienced, well-established team of 14 pediatric cardiologists and 3 NPs with 9 offices and clinics located throughout the Tampa/St. Petersburg area
- Offer comprehensive congenital cardiac care from fetal life through adulthood
- The team includes members of all pediatric cardiology sub-specialties including: fetal, advanced imaging (CT, MRI, 3D echo), intervention, electrophysiology, cardiomyopathy/heart failure, preventive, and adult congenital cardiology
- The interventional team performs over 400 catheterizations per year, about 60% of which are interventions
- Recent interventional team accomplishments include:
 - Implanting their 250th transcatheter pulmonary valve, Spring 2023
 - First program in Tampa Bay and second in Florida to implant Alterra adaptive pre-stent and Sapien valve, Summer 2022
 - First program in Florida to implant Harmony valve, Fall 2021
 - PDA stenting largely replaced surgical shunt placement in Spring 2020 for neonates with diminished pulmonary blood flow
 - First program in Florida to implant the Gore Cardioform ASD Occluder, Fall 2019
 - First program in Tampa Bay to offer PDA device closure for premature newborns, first implant, Winter 2016
- Sub-specialty clinics include general pediatric cardiology, interventional, fetal, pulmonary hypertension, cardiomyopathy, ACHD, electrophysiology, and preventive cardiology
- Our ACHD program is the ONLY certified Adult Congenital Heart Association program in north and central Florida
- This position also offers 24/7 collaboration with our excellent pediatric cardiac surgical and pediatric cardiac intensive care teams at St Joseph's Children's Hospital
- Our center offers a unique depth of hospital infrastructure:
 - Two state of the art 1000+ square foot hybrid capable catheterization labs/ORs (one biplane, one single plane)
 - Two additional biplane catheterization labs
 - Two EP labs
 - Dedicated congenital cardiac OR
 - Comprehensive pediatric cardiac intensive care unit with in-house 24-hour cardiac intensivist coverage
- We have the added benefits of a children's hospital inside a large tertiary adult hospital, which is attached to a dedicated women's hospital. The women's hospital includes a Level IV NICU. This simplifies care across all patient ages with easy access to consultants from all pediatric and adult specialties
- Pediatric, as a national pediatric cardiology group with over 125 pediatric cardiologists, provides opportunities for quality initiatives that can have national impact
- We offer an attractive schedule allowing freedom to enjoy a great quality of life
- Generous compensation and benefits package offered

Tampa Bay's warm weather affords plenty of opportunities to relish the great outdoors year round. You will live in a region others only get to enjoy on vacation. Golf at one of nearly 100 courses or relax on one of the many pristine white-sand beaches. The area offers an assortment of family venues such as zoos, aquariums, theme parks, and state parks. Additionally Tampa Bay offers access to world-class museums, professional sporting events and the performing arts. There is a wide range of residential choices to fit every budget and lifestyle - whether you are looking for big city downtown living, golf course communities, waterfront lifestyle, majestic horse farms or historic neighborhoods. There is no state income tax.

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- Leadership training and advancement opportunities
- Employee stock purchase plan at a 15% discount
- Professional liability insurance
- Support and payment for mandatory license/s and hospital credentialing

*These benefits are for full time employees, employees in other types of employment classifications may be eligible for some of these benefits.

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Pediatric 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 or veteran status.



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