CONGENITAL CARDIOLOGY TODAY
Timely News & Information for Congenital/Structural Cardiologists & Cardiothoracic Surgeons Worldwide
International Edition
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The Father of Modern Interventional Pediatric Cardiology

Kate Baldwin, Editor-in-Chief

Charles "Chuck" Mullins, MD, a pioneer whose work has led to the development of new and improved techniques and devices for diagnosing and treating children and adults with Congenital Heart Disease, is widely considered to be "the Father of Modern Interventional Pediatric Cardiology." He is a renowned pediatric cardiologist and a gifted teacher and author, who retired from Baylor College of Medicine and Texas Children's Hospital after over 35 years of service.

In the field of Pediatric Cardiology, it is difficult to go anywhere without coming across someone or something that has not been influenced by Dr. Mullins. He has taught 176 fellows how to do a "real heart cath" and 18 of his fellows have gone on to be Directors of Pediatric Cardiac Cath Labs. His teaching has reached almost every continent; North, Central and South America, Europe, Asia and Australia. He has been invited to over 300 institutions to lecture and perform cardiac catheterizations. Dr. Mullins has won many awards throughout his career: Gifted Teacher Award from the American College of Cardiology in 1989, Outstanding Achievement Award at the first Pediatric Interventional Cardiac Symposium (PICS) in 1997, Lifetime Achievement Award from the Society of Angiography and Intervention in 1998 and the Arnold J. Rudolph, MD Career Teaching Award from Baylor College of Medicine in 2000 and that just scratches the surface.

Dr. Mullins' contributions to the field are vast: he advanced the frontiers in balloon atrial septostomy, blade atrial septostomy, balloon pulmonary valvuloplasty, balloon aortic valvuloplasty, balloon coarctation angioplasty, PDA occlusion, pulmonary artery stent implant and atrial septal defect occlusion, to name a few. Dr. Mullins has also contributed various innovations to the field including; having a nurse on the manifold flush system, percutaneous needles and wires, Mullins transseptal sheath, Mullins wire and Mullins "glue" for stents.

Dr. Mullins has touched many lives over the years - his patients and his trainees all benefited from his kind, gentle manner and his incredible skill and acumen. Some say he has changed the path of their career in invaluable ways. The following paragraphs pay homage to the doctor, career, and man that is Dr. Chuck Mullins. We all hope to be so fortunate to know a man like Chuck!

Dr. Mullins with a patient.

Dr. Mullins holding the Mullins Sheath.

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Dear Dr. Chuck Mullins, This is to pay tribute to him as I spent, in the early 80's, six months with him at Texas Children's Hospital, as a part of my Sabbatical leave, from Royal Children Hospital, Melbourne, Australia.

Chuck was a very impressive and kind person and taught me Cardiac Catheterization, Angiography and fine-tuned me to prepare for Interventional Paediatric Cardiology. I returned to Melbourne and was involved in pioneering Paediatric Interventional Cardiology at Royal Children's Hospital, Melbourne in 1985. Subsequently, I was involved in ground-breaking ASD device closure (1994 with Dr. Kurt Amplatz and Dr. Jim Wilkinson) and other device interventions.

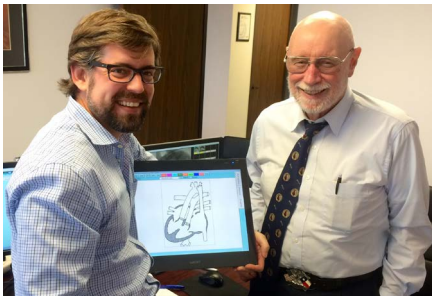
I have come to respect the mentoring and advice given to me in the earlier years by Dr. Chuck. Here is the tribute and appreciation from Paediatric Cardiologist Dr. TH Goh from down under.

DR. TH GOH
Paediatric Cardiologist
Melbourne, Australia

Charles Mullins and Deborah Schutte at Texas Children's Hospital's end of the year party in 1999.

Dr. Mullins and Tom Fagan in the cath lab

Boat trip up Rio Douro, northern Portugal, Arlene and Charles Mullins with Madalena and Fernando Maymone Martins, 2007.



James Devlin, Digisonics, and Dr. Mullins

Chuck Mullins is one of the most remarkable persons I met. What strikes me most in his character is the unusual combination of the highest standard of professional practice with the greatest simplicity in human contact. This is very exceptional. Chuck reached the top levels of fame and prestige, to which so many physicians aspire in their careers; still, he always kept clear in his mind that the priority in medicine is your patient. He combined intelligence with skill and creative imagination with deep research. The paramount quality of his scientific production did not prevent him from paying personal attention to each person and to teach those who did not match his level. We met often abroad, and he visited us in Portugal several times. He was your best friend in the cath lab. Able to understand where you stood and to take you from there to new steps. He explained what he had in mind clearly but gently, and kept highlighting what he had learned from you, without false modesty. He kept his willingness to help you like he kept his boots – at all times, as part of him. When Arlene and he gathered with our friends, colleagues and family he was the simplest and humblest around, enjoying talk, fun... and beer. A privilege to have met him!

FERNANDO A. MAYMONE MARTINS, MD, PHD, FACC, FESC
Head of Paediatric Cardiology Hospital de Santa Cruz,
Carnaxide - Lisbon, Portugal (retired)
Past President and Honorary member, the Association for European Paediatric and Congenital Cardiology (AEPC)

Charles Mullins and Galal El-Said

Chuck has been an incredible mentor for me. I'll never forget the first time we met. I did my categorical fellowship elsewhere but applied to do my 4th year fellowship at Texas Children's Hospital (TCH). I had planned to meet with him after a small group session at one of the academic meetings. He got caught talking with a colleague and so I figured he was too busy, and I would have to meet him another time. About two minutes after I left the room, I heard my name called, only to turn around to find him walking toward me. I was shocked. I couldn't believe that he would make the effort to track me down. Obviously, I'm very thankful that he did. My time at TCH was invaluable. Having the experience of learning from Dr. Mullins and the team was incredible, grueling at times, but so rewarding. Since then he has always welcomed me whenever we see each other at meetings. His hospitality and ability to make one feel part of the family, despite his celebrity status, is always something I will remember about him.

DEBORAH SCHUTTE, MD
Medical Director
Cook Children's Heart Center
Fort Worth, TX
Mullins Fellow: 1998-1999

A heartfelt appreciation to my mentor and dear friend, Dr. Charles Mullins

Arriving at Texas Children's Hospital (TCH) in the seventies, I had no idea that the single biggest influence on my career was about to transpire. This breakthrough came in the form of my training with Dr. Dan McNamara and Dr. Charles 'Chuck' Mullins. I soon learned that Chuck Mullins is not only a wizard in the Cath Lab but that he was also an extraordinary educator and a beautiful human being. During my 4 memorable years in TCH, Chuck became my lifelong mentor, a friend and a father figure for me. On my return to Cairo University I set about transferring my knowledge and developing my department, indeed still to this day, when I have a difficult case I call Chuck to get his opinion and advise. Everyone in my department knows when a difficult case goes well it is because 'I was trained by Chuck'!

Not only was he very generous to train me but he also trained the second generation of El-Said cardiologists in the form of my daughter, Howaida. Howaida has become an eminent Pediatric Cardiologist in her own right. It is difficult to describe the impact Chuck Mullins has had on my life and career. Only those who have been fortunate to experience it truly understand my gratitude and heart felt thanks to him. I only ask that God grant him good health, happiness and peace as small reward for the unconditional giving, support and empathy he gives freely.

DR. GALAL EL-SAID
Professor of Cardiology, Cairo University, Egypt

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Caution: Federal (USA) Law restricts this device to sale by or on the order of a physician. **Contraindications:** Clinical or biological signs of infection. Active endocarditis. Pregnancy. **Contraindications (CoA only):** Patients too small to allow safe delivery of the stent without compromise to the systemic artery used for delivery. Unfavorable aortic anatomy that does not dilate with high pressure balloon angioplasty. Curved vasculature. Occlusion or obstruction of systemic artery precluding delivery or the stent. Known allergy to aspirin, other antiplatelet agents, or heparin. **Contraindications (RVOT only):** Patients too small to allow safe delivery of the stent without injury to a systemic vein or to the right side of the heart. **Warnings / Precautions:** Administer appropriate anticoagulation therapy to reduce potential thrombosis. If the patient is not appropriately anticoagulated, thrombus formation may occur. The sheath must be flushed with heparinized saline via the proximal side port prior to introducing the delivery system into the body. The inflated diameter of the stent should at least equal the diameter of the intended implant site. Excessive handling and manipulation of the covering while crimping the stent may cause the covering to tear off of the stent. Retracting the covered stent back into the sheath may cause the covering to catch and tear off of the stent. Do not exceed the RBP. An inflation device with pressure gauge is recommended to monitor pressure. Pressure in excess of the RBP can cause balloon rupture and potential inability to withdraw the catheter into the sheath. Confirm that the distal end of the introducer sheath is at least 2.5cm back from the most proximal image band before inflating the outer balloon. Failure to do so may stretch the outer tubing and severely hinder balloon deflation. Exercise caution when handling the stent to prevent breakage. The NuDEL system, especially at the stent, is rigid and may make negotiation through vessels difficult. The inflation diameter of the balloon used during stent delivery should approximate the diameter of the obstructive vessel and the intended implant site. If resistance is encountered upon removal, the whole system (balloon, guidewire and sheath) should be removed as a single unit, particularly if balloon rupture or leakage is known or suspected. **Warnings / Precautions (CoA only):** Coarctation of the aorta involving the aortic isthmus or first segment of the descending aorta should be confirmed by diagnostic imaging. The NuMED CP Stent has not been evaluated in patients weighing less than 20kg. The platinum/iridium stent may migrate from the site of the implant. As with any type of implant, infection secondary to contamination of the stent may lead to aortitis, or abscess. Over-stretching of the artery may result in rupture or aneurysm formation. **Warnings / Precautions (RVOT only):** During the Premarket Approval study the Medtronic Melody valve was used for valve restoration. The safety and effectiveness of the Covered CP Stent for pre-stenting of the right ventricular outflow tract (RVOT) landing zone (i.e. prophylaxis or prevention of either RVOT conduit rupture or TPVR fracture; use as a primary RVOT conduit) in preparation of a transcatheter pulmonary valve replacement (TPVR) has not been evaluated. As with any type of implant, infection secondary to contamination of the stent might lead to endocarditis, or abscess formation. The Covered Stent can migrate from the site of implant potentially causing obstruction to pulmonary artery flow. Over-stretching of the RVOT may result in rupture or aneurysm of the RV-PA conduit or the native pulmonary artery. **Reference the IFU for a complete listing of indications, contraindications, warnings and precautions. www.bisusa.org**

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Dr. Mullins, I want to let you know the profound impact you've had on my life and career and I am sure I am speaking for all the other interventional fellows you've trained over the years when I say this.

Personally, your impact on me goes beyond and before my fellowship training with you. I remember meeting you for the very first time at the ACC back in 1992 as a cardiology fellow in training. You gave a lecture and afterwards a lot of people came up to you and spoke with you. I waited time in the background until they had their time with you. Then, I came up and introduced myself to you and we proceeded to speak for another 20 minutes. By that time, the room had emptied out and there was just the two of us. Afterwards, I remember thinking to myself, "How magnanimous was this man who is so well-known in the field and yet, he was willing to spend 20 minutes with me, a nobody."

Well, that first encounter with you always comes back to me whenever I meet a resident or fellow who is interested in pediatric cardiac interventions asking for advice. That first meeting with you taught me the importance of treating others in the same manner that you treated me back in 1992.

Early in my career, I remember every time I encountered a difficult problem in the Cath Lab, I would ask myself, "What would Chuck do?". In fact, I actually wrote with a Sharpie on the metal bar below the cath lab monitor: "WWCD". Later in my career, I would confidently say to my fellows, "This is what Chuck would do" and teach the same tips and tricks you've taught me.

I recall some of the cautionary phrases that you commonly said in the cath lab that I still say to fellows and trainees to this day. Here are three: 1). "If you move the catheter three times and it did not work, the fourth time will still not work." That comment meant you have to change the technique or change the catheter (or the "catheter-pusher"). 2). "If you don't know what's going on, take a picture". That meant if you can't figure out the anatomy or things aren't going as planned, a quick angiogram can provide clues to the problem and even prevent a complication. 3) My all-time favorite is "Echo schmecho!", referring to when you find some abnormal anatomy in the cath lab that was missed by echo. Chuck, I've tried to emulate you in every way, but I must admit I still don't (can't) whistle when my fellows have a hard time getting vascular access and I still haven't learned to wear boots in the cath lab even though you say, "There is nothing more comfortable than a good pair of boots".

Chuck, I want to tell you that you've been a great mentor to me and I am grateful for all the fatherly and career advice you have given me over the years. You've been a great colleague to me during my time at TCH and most importantly, you've been a great friend. For that, I am really grateful.

When you retired in 2006, we stole your "cathing" boots and had them bronzed with the inscription, "May these "cathing" boots immortalize your pioneering work in the field of Pediatric Interventional Cardiology. We are forever indebted to you as a mentor, teacher, colleague and friend". These words still ring true to all us who were fortunate enough to have crossed paths with you.

FRANK ING, MD, FACC, MSCAI

Professor of Pediatrics, UC Davis School of Medicine
Chief, Pediatric Cardiology, Co-director, Pediatric Heart Center,
UC Davis Children's Hospital, Davis, CA
Mullins Fellow: 1993

Frank Ing and Charles Mullins in the cath lab.

Pictured L to R: Representing the North, the South, the East and the West! Allison Cabalka, Mayo Clinic Rochester MN; Vivian Dimas, UT Southwestern Dallas TX; Charles Mullins; Julie Vincent, Columbia University NY NY; Howaida El-Said, Rady Children's Hospital San Diego CA.

It is hard to know where to begin when paying a long overdue and heartfelt tribute to our mentor and dear friend, Chuck Mullins. Do you start with his impeccable reputation, incredible catheterization skills, comprehensive knowledge, complete dedication to the field of CHD? Or just simply state that he has trained pediatric cardiology fellows from near and far and has given his all to advancing the field of pediatric interventional catheterization. This photo represents his influence in the North, South, East, and West of the United States, but we know that Chuck has single-handedly trained someone in almost every part of the world. What a privilege it was to train under one of the pre-eminent specialists and pioneers in pediatric cardiac intervention, always leading the way and developing equipment, techniques, and devices. We feel honored to be part of the Chuck Mullins Legacy and we are all very thankful for every one of the skills and tricks of the trade that we have in our current cath lab toolbox. We owe it all to Dr. Mullins.

ALLISON K. CABALKA, MD, FSCAI, FACC
Professor of Pediatrics, Consultant Pediatric Cardiology
Director, Pediatric Cardiac Catheterization Laboratory
Rochester, MN
Mullins Fellow: 1989-1992

HOWAIDA EL-SAID, MD, PHD
Professor Pediatric Cardiology, University of California San Diego, Director of Cardiac Cath lab, Rady Children's Hospital San Diego, CA
Mullins Fellow: 1999-2000

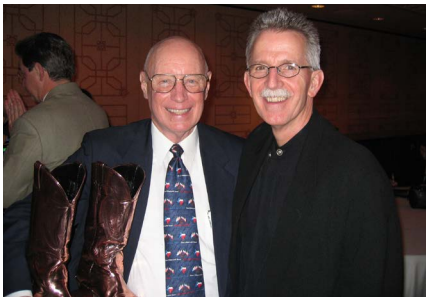
V. VIVIAN DIMAS, MD, FSCAI
Director of Cardiac Catheterization
Associate Professor of Pediatrics/Cardiology
University of Texas Southwestern Medical Center
Dallas, TX
Mullins Fellow: 2002-2006

JULIE A. VINCENT, MD, FSCAI, FACC, FAAP
Welton M Gersony Professor of Pediatric Cardiology, Columbia University, Vagelos College of Physicians and Surgeons
Steven and Alexandra Cohen Division, Chief of Pediatric Cardiology, NewYork-Presbyterian, Morgan Stanley Children's Hospital, New York, NY. Mullins Fellow: 1995-1995

Dr. Mullins as an undergrad at Princeton, Chemistry major.

Arlene Mullins, Howaida El-Said, and Charles Mullins.

Graduation Night



Chuck Mullins was presented with his bronzed Cath boots at a ceremony for him at Texas Children's Hospital with John Cheatham and other former fellows in 2006.

As a retirement gift for Chuck, his fellows bronzed the boots he always wore in the cath lab.

It is hard to put in words how I feel about Chuck. Chuck is truly a father to me! Chuck knew me when I was three years old in 1969. My father was training under him. In fact, he was his very first fellow at TCH. I remember him and Auntie Arlene as being so sweet and kind. Chuck would always come down to the floor when he talked to me and he did the same when he talked to any of his little patients. Many years went by and I came back to Texas in 1995 when I was 27 as a resident, fellow and interventional fellow. This time it was different, I was now Chuck's student. I can't say it was easy walking in my father's footsteps because they were and still are quiet big. Chuck encouraged me to be myself and truly believed in me and inspired me. Being a woman that had been pregnant once during residency and twice during fellowship (one of them while doing my intervention year) did not in any way, shape, or form affect how he treated me. In fact, he admired that I could do that while doing my fellowship, doing projects and writing papers with him. He would introduce me to people as "Howaida! Our most productive fellow in every way!" Chuck had a way of training you. He would sit in his chair and watch you like a hawk and guide you with his presence and his words. Chuck would walk in the lab and do a little dance, because that is where he was most excited and ready to help another patient. Then he would sit in his chair in the lab. You did not want Chuck to get out of his chair, his own words were "Don't make me get out of my chair". Not because he would make you feel bad, but because if he scrubbed, he could not hold himself from doing whatever it is that you were doing in two seconds and then you would just feel bad. Chuck was just simply inspiring! I really don't know how to describe this, but he was always kind and loving and fatherly, even when you were really in trouble. He would make sure you did not forget your mistake, but in a very kind and respectful way. Chuck's patients adore him. Chuck would walk into the patient's room with his cowboy boots and his cowboy belt and sit next to the patient and hold their hand and draw their heart and explain everything to them. He would always start with "How are you ma'am or Sir or young man or beautiful girl" and more importantly a huge smile. You had to feel that everything was going to be okay if he was your doctor. I will end with, that words cannot express my utmost respect and love for Chuck. May God bless you and Auntie Arlene.

HOWAIDA EL-SAID, MD, PHD
Professor Pediatric Cardiology, University of California San Diego,
Director of Cardiac Cath Lab,
Rady Children's Hospital, San Diego, CA
Mullins Fellow: 1999-2000

I was the last interventional cardiology fellow to train under Dr. Mullins as he retired late in my 4th year of fellowship training. Of the many things I remember from my time with him, there are two things which will always stand out – his incredible dedication to interventional cardiology and his humility. Even in the late stage of his career during which I worked with him, he worked tirelessly as he continued to care for his patients and innovate. He had one dedicated day a week in the cath lab which we all affectionately called "The Mullins Day." One knew if assigned to his lab that day they would see some fantastic cases, and that it would be a long day as he often had three complex interventions scheduled. He finished his book during my training, and I have one of the original signed copies. We were part of a team with the genetics group where we helped perform some procedures in the animal lab, and we needed to come up with a way to help deliver a viral vector for a gene therapy experiment. I remember him calling me to his office to show me a new balloon he created for these procedures which we called "The Mullins Monkey Balloon." He was a patient teacher who always made time for people. He took such pride in teaching all of us and imparting his knowledge from his many years of experience. I can still hear his voice when thinking through procedures. He still comes by the cath lab at Texas Children's Hospital to see what we are up to and to watch a few procedures. I am truly honored to call him a mentor, colleague and friend.

GARY E. STAPLETON, MD
Associate Professor of Pediatrics, Baylor College of Medicine
CE Mullins Cardiac Catheterization Laboratories
Texas Children's Hospital
Mullins Fellow: 2003-2007

It was an honor for me to come to Texas Children's Hospital in 2003 to work in the cath lab of the legendary Dr. Mullins. I consider myself incredibly fortunate to have had the opportunity to observe, learn from, and work alongside Chuck for several years before he retired. His international reputation was beyond deserved: watching him work was like watching a master at his craft - getting into difficult places with a catheter seemed effortless to him, and he worked with a quiet confidence. I noticed that he was confident enough to allow his fellows a fair amount of freedom in the Cath Lab while under his supervision, something I still strive to do better myself. One of the qualities that I admire most about Chuck is his humility: despite his quasi-rockstar status among cardiologists around the world, he was never one to brag about his accomplishments. I also admire his strong marriage to Arlene, who has been his trusted companion all these years. Together they traveled the globe and made countless friendships, and impacted many lives: those who hosted them, and the many patients who benefited from Chuck's knowledge and skill. Chuck was a consummate clinician, academician, and most of all, innovator. His innovations have spanned many decades, and because of his contributions the field of interventional cardiology has been changed forever. He is a living testament to the fact that innovation is more than an occasional novel idea - it's an essential part of our profession, and it is the seed of tomorrow's life-giving treatments.

HENRI JUSTINO, MD, FRCPC, FACC, FSCAI, FAAP
Director, Cardiology Innovation
Co-Director, CE Mullins Cardiac Catheterization Laboratories, Texas Children's Hospital
Professor (Tenured) of Pediatrics
Baylor College of Medicine, Houston, TX

Dr. Mullins and former fellows at his retirement party, December 2006.

Chuck's surprise birthday party in Texas with former fellows, 2019.

Dr. Mullins being promoted.

Dr. Charles Mullins

I started my training with Chuck as a 1st year Cardiology Fellow at TCH in 1978, before most of today's interventional procedures were performed. Larry Latson and I kind of got designated as Chuck and Howard Gutgesell's fellows, as combined cath/echo fellows. This meant that we had a great deal more independence in the cath lab compared to other fellows. We still had Gladys singing her gospel songs more loudly if she thought we were doing something wrong and Chuck was not in the room. However, I remember vividly how we had cardiologists from all over the world travel to TCH to learn how to perform a transseptal left heart cath. We pretty much performed transseptal technique in anyone we needed to get to the left side of the heart...regardless of the size of the patient. Remember, there was no balloon aortic valvuloplasty at that time and balloon angioplasty for CoA was a few years away. Heck, Jean Kan didn't even perform balloon pulmonary valvuloplasty on her pet bulldog Rumbo, until 1982! My fondest memory of being in the cath lab with Chuck, other than Gladys singing, was his saying if you were having trouble getting the catheter to go where it was supposed to go, "either change the catheter or change the catheter pusher!"

P.S. I think I got Raynaud's from burning my fingers in the steaming saline on the burner that we had to use to "shape" catheters before dipping them in the cold saline.

JOHN P. CHEATHAM, MD, MSCAI
Interventional Cardiology
The Heart Center, Nationwide Children's Hospital
Professor Emeritus, Dept of Pediatrics, Cardiology
The Ohio State University, Columbus, OH
Mullins Fellow: 1978-1981

From one of Chuck's Military Fellows:

Chuck's military background at Walter Reed made him the perfect mentor for me and for many other military fellows (Mark Duster, Pat Glasow, Mike Slack to name just a few). The sudden transition from a small military residency program and a few years practicing general pediatrics to the in-house intense and busy training experience at TCH was, to say the least, challenging. Chuck helped ease the pain with his deep understanding of our backgrounds, his supportive good humor, and his intense personal drive to develop the field of pediatric interventional cardiology.

During my time, fellowship itself was only two years (the third was optional). Fourth-year, focused interventional training, did not exist. I had only two years to soak up as much as possible and find my direction. Chuck made this simple for me. It took just a few sessions helping him implant the Rashkind PDA Occluder and ballooning some pulmonary valves and arteries, and I was hooked: The Cath Lab would be my focus. My procedural takeaways from Chuck were many, especially the trans-septal. But, the most important thing Chuck taught was what he calls "how to cath." I strive always to achieve the standards he set in those days, almost 40 years ago.

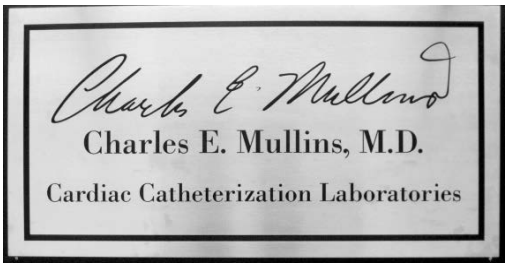
When my time at TCH was over, I was called back to the Army. Chuck stepped in and contacted some of his friends at Walter Reed. He told me very specifically that there was only one job in the Army for someone who wanted to focus on pediatric interventions. That job was at Walter Reed in Washington, DC. I thank Chuck to this day for giving me this guidance and assistance. Walter Reed turned out to be just the kind of medical environment I needed to develop.

Chuck didn't stop there. Within two years of my arrival at Walter Reed, Chuck came as a visiting professor. He gave some talks, but most importantly, he cathed with me for several days. I had collected a bunch of mostly diagnostic cases. As my "assistant," at the table he helped with some gentle guidance and suggestions. Within one week of his return to Houston, I received a three page, single-spaced typed letter with very detailed recommendations for improving my cath techniques and the pediatric catheterization protocols at Reed. Chuck's letter awakened me. It provided the inspiration to undertake my career long preoccupation with continuous technical improvement, patient risk reduction, and catheterization lab program improvement.

Throughout the intervening years, I have been fortunate to continue a close relationship with Chuck. It always helps in difficult procedures and in complex cath lab issues, to consider what Chuck would do.

JOHN MOORE, MD, MPH
Director, Division of Cardiology, Rady Children's Hospital—San Diego
Professor and Chief of Pediatric Cardiology, UC San Diego School of Medicine, San Diego, CA
Mullins Fellow: 1983-1985

Dr. Mullins receiving an award.



Dedication plaque for the CE Mullins Cardiac Catheterization Laboratories, Texas Children's Hospital, Houston, TX.

Dr. Mullins, honorary Texan, removes his cowboy boots to show how much leg hair has been lost cathing all those kids. The Doctors from left to right; Mark Hoyer, Tom Fagan, Chuck Mullins, Bill Hellenbrand, John Murphy, Larry Latson, John Cheatham and Bob Vincent.

It's an honor to be able to say a few words in tribute to Dr. Mullins in this issue of Congenital Cardiology Today. I first met Chuck in February 1986, when he came to Toronto to proctor me on the transvenous long sheath technique to close the arterial duct with the Rashkind PDA device. After watching him do the procedure, I realized pretty quickly that I had a long way to go before I could (if ever) achieve the catheter techniques needed to be a successful Interventional Pediatric Cardiologist. During those few days Chuck taught me how to do a transseptal puncture....which we did to determine if there was any residual shunt after the implant. Pretty exciting for 1986! I also remember very clearly those ever-present cowboy boots he wore in the dead of winter north of the 49th parallel!

Chuck taught us...and he developed a subspecialty which has bettered the lives of all with CHD.

LEE BENSON, MD, MSCAI

Professor of Pediatrics (Cardiology)
Director, The Cardiac Diagnostic and Interventional Unit
The Hospital for Sick Children
University of Toronto School of Medicine
Toronto, Canada

It's hard to believe that I have been so lucky to know Dr. Chuck Mullins for over 40 years. It is truly an honor to have had Chuck as a teacher, mentor, and now, as a friend. Even in the 1970s, when I was a resident and fellow, no other physician commanded more respect and admiration at Texas Children's Hospital. His unrelenting insistence on absolute top quality and hard work shaped the character of a huge number of pediatric cardiologists, both in and out of the cardiac catheterization lab. His trademark was his "BELLOW", but these "corrections" only enhanced the sense of accomplishment from a word of praise. Many of us truly consider Chuck to be a model for how to be a firm, but fair and caring leader. The tales of Dr. Mullins' technical skills are legendary and well deserved. He would never abandon a patient/procedure in the cath lab until he got the information that was needed. He has constantly looked for better ways to understand and treat his patients. Transeptal catheterization, safe delivery of closure devices, pulmonary artery stenting, and many other techniques were all developed and/or refined by Chuck. His innovations have truly shaped the modern approach to cardiac catheterization for congenital and structural heart disease, and all accolades are richly deserved.

LARRY LATSON, MD

Director Pediatric Catheterization and ACHD
Joe DiMaggio Children's Hospital/Memorial Hospital System
Hollywood, FL
Mullins Fellow: 1978-1981

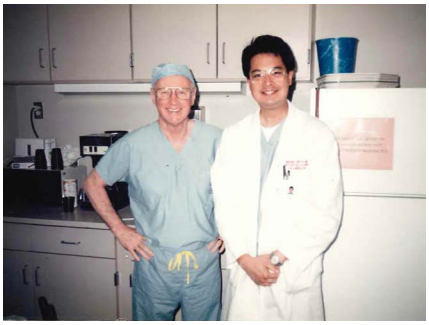
I was fortunate to be one of the last fellows to work with Dr. Mullins in the catheterization lab at Texas Children's. I had the opportunity to travel with Chuck to San Antonio for research on multiple occasions which will always remain a highlight of my training career. We typically stopped on the way back home at his land he called "The Patch." This had a drought-stressed pond and, like everything else in Texas, the grandest tree house that he built for his grandchildren, elevated at least 20 feet in the air and a couple stories tall. The tree house is analogous of Chuck's career, larger than life. I have worked with, trained under, over, and alongside many people, and Chuck has the unique ability to combine education with excellent patient care, collegiality with friendship, and mentorship with career development. I still remember and quote a number of "Mullinsisms" that I continue to try to pass on to this day. One of my favorites to describe the right and left atrium is: "If I cut off your right ear and put it on the left side of the road, does it become a left ear?" I still hear his voice resonate from a chair at the end of the catheterization table. When unable to navigate a catheter or wire to the desired location I find myself saying, "You tried that three times, do you think the outcome will be any different the fourth? Why don't you do something different or just stop and take a picture?" I, as well as everyone else who had the opportunity to work with Chuck, know that he has contributed immensely to the field of cardiology, people's careers, and patient care in ways that go beyond the ability to express.

MARK LAW, MD

Associate Professor, Department of Pediatrics
Division of Pediatric Cardiology
Cardiology Fellowship Director
University of Alabama at Birmingham, Birmingham, AL
Mullins Fellow: 2004-2006

There are no words adequate enough to describe the impact Dr. Mullins had on our field. While I have not had the honor of having directly worked with Dr. Mullins, I somewhat consider myself an "indirect" descendent from Dr. Mullins teachings, thanks to John Cheatham, my mentor during my early career at Nationwide Children's. Dr. Mullins' textbook on "Cardiac Catheterization in Congenital Heart Disease" had almost become a bible to me during that time. I finally personally met Dr. Mullins for the first time at the 2006 Skills Workshop of the *ISHAC Symposium* in Columbus, Ohio. What stuck with me was his interest for anything new (and I think the photo showing him with Kurt Amplatz at that time is a great example of this). On a personal level, Dr. Mullins always took time to talk to and advise young cardiologists such as me. Not just an incredible cardiologist, but a wonderful human being.

RALF J. HOLZER, MD, MSC, FACC, FSCAI
David Wallace Starr Foundation
Professor of Pediatric Cardiology
Chief, Division of Pediatric Cardiology
Weill Cornell Medicine
Director, Pediatric Cardiac Catheterization
NewYork-Presbyterian Komansky Children's Hospital
New York, NY



Dr. Mullins and Mitch Recto in Houston, Texas, 1996.

Ron Grifka, Michael R. Nihill and Charles Mullins.

Chuck,

It is difficult to put into words what a profound impact that you made on my career and life - and the entire field of Pediatric Cardiology. You have always been the perfectionist, whether it be in physical exam, obtaining pressure waveforms, performing angiography or stent placement. And, your perfectionism was contagious! I can still hear your words ringing in my ears, "Every angiogram should be perfect, you should want to put in a book" (and on occasion, "Ron, that one's not going in any book!"). You were the quintessential mentor; patient yet exacting, always leading us to our greatest potential. It was an honor to train with you, be on faculty with you and take over your cath lab. You made us better Cardiologists, Interventionalists - and people, and for that I am eternally grateful. Even greater than these achievements, you are a humble soul and a dear friend. Many thanks for all that you have done for me, our colleagues, our profession – and the kids! Best wishes to you and Arlene.

With respect and admiration, Ron

RONALD G. GRIFKA, MD, FAAP, FACC, FSCAI
Chief Medical Officer
Metro Health-University of Michigan Health
Professor of Pediatrics
University of Michigan Medical School
Attending Cardiologist, C. S. Mott Children's Hospital
Fellow: 1988-1992

I was welcomed into the TCH (Texas Children's Hospital) cardiology family by Dr. Mullins in July of 1996. I consider this probably the third most important event in my life following my marriage to Carla and the birth of my three daughters (one of whom was born in Houston). I remember that fall morning in September 1995 very clearly, it was 6:30am and I had just gotten off my Continental Airlines flight from Houston and had taken a cab from Newark directly to Mt Sinai Hospital in NYC. My Chief of Pediatric Cardiology, Dr. Richard Golinko, who was at the hospital early that morning, was literally screaming at the top of his voice for me to come into his office where he proceeded to inform me that he had just spoken to Dr. Mullins and that I had been offered the position of Pediatric Interventional Fellow to start July 1, 1996 at TCH. I don't know if Dr. Mullins even remembers the fact that even without first asking me, Dr. Golinko accepted the position on my behalf, clearly the best decision that Dr. Golinko and I both made! It wasn't until later that morning that I called Dr. Mullins to thank him personally. This singular event has shaped the course of my life for the next 24 years (literally until today). Dr. Mullins also helped me get my first job as an Interventional Cardiologist when he recommended to Dr. Bob Solinger at the University of Louisville that he take an unproven newly graduated pediatric interventional cardiology fellow, one whose visa status mandated a return to one's native country (in my case the Philippines) for two years. Dr. Mullins wrote the immigration service (I still have his letter of support) and together with the university was able to obtain a special 0-1 visa that enabled me to work in this country without having to first return to the Philippines for two years. Over the next 24 years Dr. Mullins (and he will always be Dr. Mullins as I have an extremely difficult time calling him Chuck) has helped me at various stops in Louisville, KY, New Orleans, LA and now Children's Hospital Orange County in Southern California. I know that I will never be able to thank him enough for all his support, but can only hope that he continues to take great pride in knowing that he has impacted the lives of his many fellows and trainees. I wish nothing but many more good years of continued good health for both Dr. and Mrs. Mullins and will forever be grateful for their support and wisdom.

MICHAEL R. RECTO, MD, FACC, FSCAI, FAAP
Chief Pediatric Cardiology, Children's Hospital Orange County (CHOC)
Professor Clinical Pediatrics, University of California Irvine
Mullins Fellow: 1996-1997

John P. Breinholt cathing with Dr. Mullins.

I had the unique opportunity of traveling from Houston to San Antonio with Dr. Mullins on a couple of road trips to participate in animal research. Those days were a highlight of fellowship where Chuck would discuss the history of our field that he lived, the lessons he learned, full of insight or humor, and counsel to carry with you the rest of your career. You then spent the day, side by side with him, cathing a monkey. What more could you want?! I will always have deep gratitude for Dr. Mullins. I was just one of his many fellows, but when he witnessed a challenge I faced, he spoke out in support; you could always count on him to do what he believed was right. That action influenced important decisions that have shaped my career.

JOHN P. BREINHOLT III, MD
Professor and Chief, Pediatric Cardiology
Director, Cardiac Catheterization Laboratories
Phoenix Children's Hospital
University of Arizona College of Medicine – Phoenix
Mullins Fellow: 2003-2007

Chuck continues to be an outstanding teacher, motivator and mentor. Though 25 years have passed since I left Texas Children's Hospital, hardly a week goes by that I don't reflect upon my great fortune to have trained with him. As technically skilled as he was, I learned more from Chuck in terms of his clinical judgment and situational awareness. If something was worth doing for the patient, Chuck spared no effort to accomplish what was needed. He was aggressive, but appropriately so, and not cavalier. If something was not worth doing, or of marginal benefit, he recognized this and had no difficulty letting it go. I appreciated his exceptional skill of risk-benefit analysis, and often ask myself in the midst of cases: What would Chuck say about this? As time has passed, as evidenced by the photo, now I even emulate his look! Thank you, Chuck -- I am forever grateful!!

STEPHEN F. KAINE, MD, FAAP, FACC, FSCAI
Medical Director, Cardiovascular Laboratories
Associate Director, Ward Family Heart Center
Children's Mercy Kansas City
Associate Professor of Pediatrics
University of Missouri - Kansas City School of Medicine
Kansas City, MO
Fellow: 1992-1995

Dr. Mullins and Kurt Amplatz at the 2006 Skills Workshop of the ISHAC Symposium in Columbus, Ohio.

I'm a young-un. I trained with Dave Balzer and Shabana Shahanavaz in St. Louis, and I remember reading the Mullins textbook in the early months of Cardiology training. It was my way of proving my interest in the interventional work that he helped pioneer. I'm still amazed at what he's accomplished and how his work has laid the foundation for such an exciting field of medicine. I first met Dr. Mullins on the dance floor at PICS 2014 in Chicago, and I'm pretty sure he was wearing cowboy boots. Even though I never cathed with Dr. Mullins, it's been a real privilege to learn from his experience through his published work and by the mentorship of the Interventional community that he helped create. Brian Boe snapped this picture at PICS 2019 with the caption, "Imitation is the sincerest form of flattery that mediocrity (me) can pay to greatness (Mullins)!" I think he was referring to our haircuts, but I'd be thrilled if my career's impact could imitate his!

TOBY A. ROCKEFELLER, MD
Interventional Pediatric Cardiology
Ward Family Heart Center
Children's Mercy Kansas City
Kansas City, MO

"Emulating my professional father figure," Chuck Mullins and Stephen F. Kaine.

Dr. Rockefeller and Dr. Mullins at PICS 2019. Photo credit: Brian Boe

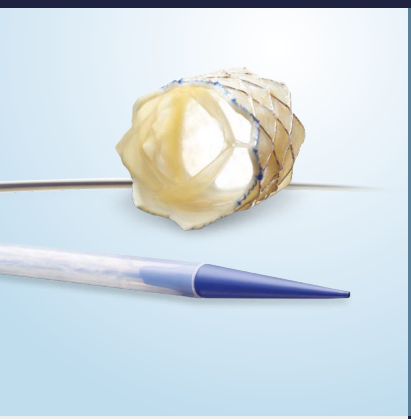
Dr. Mullins with Dr. Helen Taussig.

Interventional cardiology was barely "a thing" when I completed my general pediatric cardiology training. We were taught pulmonary and aortic valvuloplasty but coarctation angioplasty was "new". When I came to Dallas, there was minimal intervention; we needed to get into the game and so I reached out to several "interventionalists" to teach me some of the new things like PDA closures, coarctation and PA stenting. Chuck responded without hesitation, first, by letting me come down to Houston to observe cases I referred to him, then by coming up to proctor me on some procedures, and then by allowing me to train as a fellow in his lab (which by the way was against the better judgement of his chief who thought training me would lead to some competition in the state*). This is where I met so many wonderful people in interventional cardiology, people who would become life-long friends and colleagues. This is an incredibly important gift I received (not to mention the great training). My knowing Chuck led to being introduced to another person who knew Chuck, and then led to meeting others in this tight community, like an enzymatic cascade of introductions. This allowed me to meet people, PIs involved in clinical trials who were looking for new contributors. This led to meeting representatives in industry who were looking for large volume centers and then to participation in Phase I and II trials of every device we currently use. And finally, Chuck introduced me to and helped me recruit the second interventionalist in our group, someone who has become an innovative force herself in the interventional cath community, a gift to our program that keeps on giving. None of this would have happened for our center, or for me, if not for Chuck Mullins. These things represent the true generosity of this man and his legacy of giving to individuals, to the community of interventional cardiology and to the hundreds of thousands of patients who have benefitted from his actions. Thank you, Chuck. I am a much better person and doctor for having met you and I am extremely proud to call you my friend and colleague.

*Let's face it, everyone knows that few represent true competition to Chuck Mullins; he's a titan.

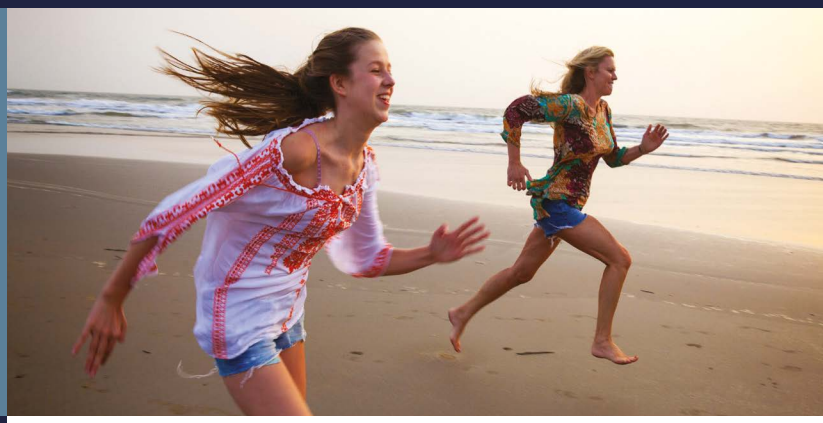
THOMAS M. ZELLERS, MD
Professor of Pediatrics, Division of Cardiology
UT Southwestern Medical School
Dallas, TX
Fellow: 1997

RIGHT CHOICE.



Melody™

Transcatheter Pulmonary Valve (TPV) System



Not intended to constitute medical advice or in any way replace the independent medical judgment of a trained and licensed physician with respect to any patient needs or circumstances. Melody TPV is not suitable for all patients and ease of use, outcomes, and performance may vary. See the Instructions for Use for indications, contraindications, precautions, warnings, and adverse events.

Restoring lives for

13

years and counting.

The only transcatheter pulmonary valve specifically designed for RVOT conduits and bioprosthetic valves. The longest studied transcatheter valve, with the largest body of clinical evidence at over 10 years.* More than 16,000 patients' lives have been changed over 13 years, and counting.

Melody TPV — The Right Choice for Your Patients

*Melody Transcatheter Pulmonary Valve Study: Post Approval Study of the Original IDE Cohort.

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Medtronic
Further, Together

Important Labeling Information for the United States

Indications: The Melody TPV is indicated for use in the management of pediatric and adult patients who have a clinical indication for intervention on a dysfunctional right ventricular outflow tract (RVOT) conduit or surgical bioprosthetic pulmonary valve that has ≥ moderate regurgitation, and/or a mean RVOT gradient ≥ 35 mm Hg.

Contraindications: None known.

Warnings/Precautions/Side Effects

- **DO NOT implant in the aortic or mitral position. Pre-clinical bench testing of the Melody valve suggests that valve function and durability will be extremely limited when used in these locations.**
- DO NOT use if patient's anatomy precludes introduction of the valve, if the venous anatomy cannot accommodate a 22 Fr size introducer, or if there is significant obstruction of the central veins.
- DO NOT use if there are clinical or biological signs of infection including active endocarditis. Standard medical and surgical care should be strongly considered in these circumstances.
- Assessment of the coronary artery anatomy for the risk of coronary artery compression should be performed in all patients prior to deployment of the TPV.
- To minimize the risk of conduit rupture, do not use a balloon with a diameter greater than 110% of the nominal diameter (original implant size) of the conduit for pre-dilation of the intended site of deployment, or for deployment of the TPV.
- The potential for stent fracture should be considered in all patients who undergo TPV placement. Radiographic assessment of the stent with chest radiography or fluoroscopy should be included in the routine postoperative evaluation of patients who receive a TPV.
- If a stent fracture is detected, continued monitoring of the stent should be performed in conjunction with clinically appropriate hemodynamic assessment. In patients with stent fracture and significant associated RVOT obstruction or regurgitation, reintervention should be considered in accordance with usual clinical practice.

Potential procedural complications that may result from implantation of the Melody device include the following: rupture of the RVOT conduit, compression of a coronary artery, perforation of a major blood vessel, embolization or migration of the device, perforation of a heart chamber, arrhythmias, allergic reaction to contrast media, cerebrovascular events (TIA, CVA), infection/sepsis, fever, hematoma, radiation-induced erythema, blistering, or peeling of skin, pain, swelling, or bruising at the catheterization site. Potential device-related adverse events that may occur following device implantation include the following: stent fracture,* stent fracture resulting in recurrent obstruction, endocarditis, embolization or migration of the device, valvular dysfunction (stenosis or regurgitation), paravalvular leak, valvular thrombosis, pulmonary thromboembolism, hemolysis.

*The term "stent fracture" refers to the fracturing of the Melody TPV. However, in subjects with multiple stents in the RVOT it is difficult to definitively attribute stent fractures to the Melody frame versus another stent.

For additional information, please refer to the Instructions for Use provided with the product or available on http://manuals.medtronic.com.

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

Important Labeling Information for Geographies Outside of the United States

Indications: The Melody™ TPV is indicated for use in patients with the following clinical conditions:

- Patients with regurgitant prosthetic right ventricular outflow tract (RVOT) conduits or bioprostheses with a clinical indication for invasive or surgical intervention, OR
- Patients with stenotic prosthetic RVOT conduits or bioprostheses where the risk of worsening regurgitation is a relative contraindication to balloon dilatation or stenting

Contraindications

- Venous anatomy unable to accommodate a 22 Fr size introducer sheath
- Implantation of the TPV in the left heart
- RVOT unfavorable for good stent anchorage
- Severe RVOT obstruction, which cannot be dilated by balloon
- Obstruction of the central veins
- Clinical or biological signs of infection
- Active endocarditis
- Known allergy to aspirin or heparin
- Pregnancy

Potential Complications/Adverse Events: Potential procedural complications that may result from implantation of the Melody device include the following: rupture of the RVOT conduit, compression of a coronary artery, perforation of a major blood vessel, embolization or migration of the device, perforation of a heart chamber, arrhythmias, allergic reaction to contrast media, cerebrovascular events (TIA, CVA), infection/sepsis, fever, hematoma, radiation-induced erythema, pain, swelling or bruising at the catheterization site. Potential device-related adverse events that may occur following device implantation include the following: stent fracture.* stent fracture resulting in recurrent obstruction, endocarditis, embolization or migration of the device, valvular dysfunction (stenosis or regurgitation), paravalvular leak, valvular thrombosis, pulmonary thromboembolism, hemolysis.

*The term "stent fracture" refers to the fracturing of the Melody TPV. However, in subjects with multiple stents in the RVOT it is difficult to definitively attribute stent fractures to the Melody frame versus another stent.

For additional information, please refer to the Instructions for Use provided with the product or available on http://manuals.medtronic.com.

The Melody Transcatheter Pulmonary Valve and Ensemble II Transcatheter Delivery System has received CE Mark approval and is available for distribution in Europe.

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Fax: (651) 367-0918
rs.structuralheart@medtronic.com

UC201809495b EN 11/2020

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From Open-Heart Surgery to Surfing the Waves Once Again

Oliver Merlob, 15, is back on his feet, and his surfboard, thanks to his Congenital Heart Team at Cedars-Sinai

Just moments after Calabasas ninth-grader Oliver Merlob was born, he was whisked away for open-heart surgery to treat a congenital heart defect. Little did his parents know it would be the beginning of a lifelong relationship.

Moments after birth, Oliver Merlob, had open-heart surgery to treat a congenital heart defect, pulmonary atresia.

The relationship forged at birth between the Merlob family and Evan Zahn, MD, a leading congenital heart expert who serves as Director of the Guerin Family Congenital Heart Program in the Smidt Heart Institute at Cedars-Sinai, has been at the heart of Oliver's journey throughout his life. This was especially true a few months ago when he underwent his second – and possibly his last – open heart surgery at Cedars-Sinai.

Today, Merlob is back surfing waves in Malibu, attending virtual classes, completing homework assignments, and somehow finding time to play a regular round of tennis.

"Watching Oliver grow and thrive has been one of the highlights of my career," said Zahn. "Caring for patients like Oliver and his family – from the time they are diagnosed in utero through the arch of their entire adult life – is truly incredible. It's quite an honor."

Unlike children's hospitals and other congenital heart programs that only care for patients through adolescence, the Guerin Family Congenital Heart Program treats patients from birth, through adolescence, and for the course of their entire adult lives.

"Our patients receive care for their entire lifetime, by a singular multidisciplinary team that has literally known them their entire lives," said Zahn. "It creates such a special bond between a patient, their family and their care team."

This unique model, allowing medical teams to build deep and meaningful relationships with their patients often brings comfort to those undergoing complex and often difficult diagnoses and procedures.

"I never feel scared or nervous, because I always have Dr. Zahn to guide me," said Merlob. "He has always been there for me."

Since his initial open-heart surgery, Merlob has undergone countless procedures, tests and exams to treat his pulmonary atresia, a congenital defect that happens when the heart doesn't form as it should in the womb.

The condition specifically affects the opening of the pulmonary valve, which connects the right ventricle and the main pulmonary artery, which carries blood to the lungs. With pulmonary atresia, blood cannot flow to the lungs.

"Oliver has a sparkling personality," said Richard Kim, MD, Director of Congenital Heart Surgery at Cedars-Sinai, who performed Merlob's most recent surgery. "Upon meeting him, you would never guess all that he has been through medically. He focuses on the good and makes every experience – even open-heart surgery – a positive thing."

Oliver Merlob, 15-years-old, surfing in Malibu, CA after he underwent his second – and possibly his last – open heart surgery at Cedars-Sinai.

Merlob's latest procedure was "especially complex," according to Kim.

"These catheterization procedures kept Oliver healthy and well for 15 years, but over time, they can cause scarring and calcification around the heart and major blood vessels," said Kim. "Because the major arteries to his legs could not be used in his case, the surgery to safely replace his valve without injuring his heart required the use of the heart-lung machine and techniques borrowed from operations on newborn infants and children."

Oliver Merlob with his Congenital Heart Team, Dr. Richard Kim, Cardiac Surgeon, and Dr. Evan Zahn, Pediatric Cardiologist, Smidt Heart Institute at Cedars-Sinai.

It was a challenge, Kim said, but not uncommon.

"This type of complex, high-risk surgery is where we shine," said Kim. "We perform surgeries like these very often and are equipped to handle all of the unique nuances that come with them."

Patients treated in the program receive the most sophisticated treatment available, including advances in nonsurgical techniques like those Merlob has previously benefited from.

"Knowing and caring for patients from childhood to adulthood is nothing short of a privilege," said Kim. "And Oliver is certainly one of those special, beautiful cases that makes what we do so rewarding."

Weill Cornell Medicine, NewYork-Presbyterian Hospital, and Illumina Collaborate on Scalable Clinical Whole-Genome Sequencing Initiative

PRNewswire - Seeking to advance the scope of Precision Medicine, Weill Cornell Medicine, NewYork-Presbyterian Hospital, and Illumina, Inc. are entering into a collaboration to sequence the complete human genomes of thousands of consenting patients, in order to identify genetic alterations driving disease and potentially reveal previously unidentified therapies for treatment. The initiative, which also includes a collaboration between Weill Cornell Medicine, NewYork-Presbyterian Hospital, and the New York Genome Center (NYGC), aims to evaluate the diagnostic potential of whole-genome sequencing at scale, which allows the interrogation of the full genome sequence of a patient's DNA. The goal is to better understand health problems and potential disease risks of individual patients, and to design more effective treatments, including the choice of specific drugs and their dosing.

Investigators will study the feasibility and viability of large-scale implementation of whole-genome sequencing within an academic medical center that is part of a major metropolitan health care system in the United States. Whole-genome sequencing has already been shown to improve patient care and disease prevention in specific clinical contexts, but few systems have deployed whole-genome sequencing across multiple care pathways. Weill Cornell Medicine, through its Caryl and Israel Englander Institute for Precision Medicine, and NewYork-Presbyterian/Weill Cornell Medical Center, which have applied this precision medicine approach to investigate cancer's molecular underpinnings since 2015, will be among the first medical institutions to examine the feasibility of large-scale whole-genome sequencing across multiple diseases. In addition to revealing the role individual genes play in disease and therapeutic responses, the study could also yield promising new avenues for scientific inquiry.

Under the initiative, which originates from Weill Cornell Medicine's Englander Institute for Precision Medicine, doctors at Weill Cornell Medicine and NewYork-Presbyterian/Weill Cornell Medical Center will offer qualifying patients the option to have their genomes sequenced as part of their diagnostic workups. NYGC will leverage its high-throughput whole-genome sequencing clinical sequencing expertise to investigate patients' DNA, using Illumina's patented Next-Generation Sequencing technology. NYGC was the first sequencing center in the country to gain regulatory approval for clinical whole-genome sequencing tests for genetic diseases and cancer from the New York State Department of Health Clinical Laboratory Evaluation Program. Board-certified molecular geneticists at NYGC will interpret and share the results with ordering physicians, who will then share them with their patients. The initiative will focus on the disease areas of oncology, cardiovascular, metabolic and neurodegenerative diseases. This first phase will inform the next steps to expand infrastructure to support more widespread testing in years to come.

"We are committed to expanding whole-genome sequencing to cancer and other common diseases more broadly, so that the approach can eventually become a routine part of healthcare, an essential source of data for biomedical research and, importantly, enhance patient care," said Dr. Olivier Elemento, Director of the Englander Institute for Precision Medicine at Weill Cornell Medicine, who also leads joint precision medicine efforts at Weill Cornell Medicine and NewYork-Presbyterian/Weill Cornell Medical Center. "This project and the network of participating institutions will be the largest of its kind for clinical whole-genome sequencing in the United States, and may lead to key medical and scientific advances that improve patients' lives for generations to come."

"We are pleased to participate in these important collaborations with Weill Cornell Medicine, Illumina and the New York Genome Center. We are committed to improving the quality of life for all of our patients," said Dr. Katherine L. Heilpern, Group Senior Vice President and Chief Operating Officer of NewYork-Presbyterian/Weill Cornell Medical Center. "This whole-genome sequencing initiative is particularly exciting as it begins to examine the possibilities of this new frontier and its ability to better identify diagnoses and treatments for a range of diseases."

"Working together to deploy whole-genome sequencing as a front-line test in an American healthcare system is truly trailblazing," said Phil Febbo, Senior Vice President and Chief Medical Officer at Illumina. "We are excited to pilot what is possible through combining the passion of physician-scientists in an academic medical center with the power of genomic information. We hope that biological insights from whole-genome sequencing will lead to better ways to care for people with cancer, cardiovascular disease, metabolic and neurodegenerative disorders."

"Whole-genome sequencing and advanced bioinformatics will provide clinicians with a permanent record of a patient's complete genetic 'code,' which can be interrogated throughout their lives as our understanding of the relationship between individual genetic variation and disease advances, and new life-saving therapies are developed," said Dr. Tom Maniatis, the Evnin Family Scientific Director and Chief Executive Officer of the New York Genome Center. "Our close collaboration with Weill Cornell Medicine and NewYork-Presbyterian Hospital will explore the utility of clinical whole-genome sequencing in diagnosing cancer and other common diseases so that physicians can create individualized treatment plans and make data-driven clinical decisions."

This collaboration sets out to make great strides towards improving human health and driving excellence in patient care and scientific discovery by unlocking the power of the genome. Enrollment in the initiative began in October 2020, at the discretion of participating physicians. Physicians may recommend whole-genome sequencing for patients who have had inconclusive results from other limited or target genomic panels. The whole-genome sequencing testing will be provided for free to patients who qualify for participation in the initiative.

Patients who enroll in the initiative will consent to their participation in human research, and to having their genomes sequenced. They will own their results and can have access to them as part of their clinical record, if so desired. Patients may also choose to consent to the sharing of their genomic results with scientists at Weill Cornell Medicine, and potentially outside academic institutions and industry collaborators, for further scientific research and discovery of innovative therapeutics and diagnostics. Should patients authorize such sharing, their clinical information will be de-identified to protect patient privacy. WGS patient data will never be sold to outside parties.

Outlook on the Electrophysiology Catheters Global Market to 2026- Increasing Demand of Early Diseases Diagnosis is a Major Driving Factor

PRNewswire - The "Global Electrophysiology Catheters Market 2020-2026" report has been added to ResearchAndMarkets.com's offering.

The global electrophysiology catheters market is estimated to grow significantly during the forecast period. The growth of the market is attributed to the increasing demand of early diseases diagnosis and treatment by electrophysiology diagnostic catheters.

The prognosis of patients along with adult congenital heart diseases has enhanced significantly due to early diagnosis and advancements in surgical corrective techniques. The electrophysiology catheter is utilized to deliver low-voltage and high-frequency current, which destroy the heart tissue that is responsible for the arrhythmia. The patients who have had a catheter ablation have experienced a long-term reduction in the number of arrhythmias and a return to normal heart rhythm.

The global market for electrophysiology catheters is segregated on the basis of product type and end-user industry. Based on the product type, the market is further classified into diagnostic catheters and ablation catheters. The diagnostic catheters segment is projected to have a considerable growth in the global market. Based on the end-user, the global electrophysiology catheters market is further segmented into hospitals & clinics and ambulatory surgical centers. The hospitals segment is estimated to have a considerable share in the market owing to the growing number of surgeries in hospitals and clinics. Based on geography, the global electrophysiology catheters market is further segregated into; North America, Europe, Asia-Pacific and the Rest of the World. The North American region is projected to have a considerable share in the global electrophysiology catheters market.

The companies which are contributing to the growth of the global electrophysiology catheters market include Abbott Laboratories, Boston Scientific Corp., Johnson & Johnson Services, Inc., Medtronic PLC, Stryker Corp., and others. Product launches, mergers and acquisitions, collaboration with governments and technological advancements made by market players are all considerably contributing to market growth.

Market Segmentation

1. Global Electrophysiology Catheters Market Research and Analysis by Product Type
2. Global Electrophysiology Catheters Market Research and Analysis by End-User

The Global Electrophysiology Catheters Market 2020-2026 Report Includes the Following:

- Comprehensive research methodology of the global electrophysiology catheters market.
- A detailed and extensive market overview with key analyst insights.
- An exhaustive analysis of macro and micro factors influencing the market guided by key recommendations.
- Analysis of regional regulations and other government policies impacting the global electrophysiology catheters market.
- Insights about market determinants which are stimulating the global electrophysiology catheters market.
- Detailed and extensive market segments with regional distribution of forecasted revenues.
- Extensive profiles and recent developments of market players.

FEBRUARY

11-14

CPP 2021 – The 6th International Congress on Cardiac Problems in Pregnancy
Porto, Portugal
https://cppcongress.com/register-now/

MARCH

05-06

5th International Conference on Cardiomyopathy in Children
Virtual
https://childrenscardiomyopathy.org/unique/physician-resources/scientific-conference.html

10-13

Morphology and Echocardiography in Neonates and Children
Hands-on Interactive Morphology and Echo Course
Birmingham, AL, USA
https://www.congenitalecho.co.uk/

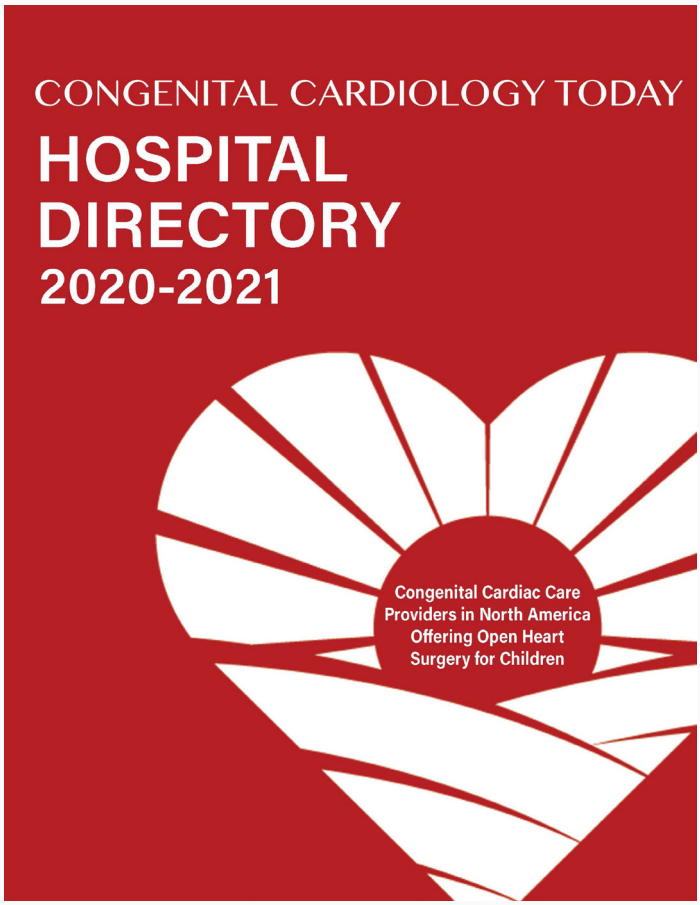
19-20

2020 World Heart and Cardiothoracic Surgery Conference (WHCS)
Bangkok, Thailand
https://heart.episirus.org/

MAY

15-17

ACC.2021
Atlanta, GA, USA
https://accscientificsession.acc.org/en



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