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# Comparison of Patent Ductus Arteriosus Stent and Blalock-Taussig Shunt as Palliation for Neonates with Sole Source Ductal-Dependent Pulmonary Blood Flow: Results from the Congenital Catheterization Research Collaborative

*Bauser-Heaton H, Qureshi AM, Goldstein BH, Glatz AC, Ligon RA, Gartenberg A, Aggarwal V, Shashidharan S, McCracken CE, Kelleman MS, Petit CJ. Pediatr Cardiol. 2022 Jan;43(1):121-131. doi: 10.1007/s00246-021-02699-7. PMID: 34524483*

*Commentary from Dr. Manoj Gupta*

## Take Home Points

1. Patent ductus arteriosus (PDA) stenting is an accepted method for securing pulmonary blood flow in cyanotic neonates. In neonates with pulmonary atresia and single source ductal-dependent pulmonary blood flow (SSPBF), PDA stenting remains controversial.
2. Thirty-five patients with PDA stents and 156 patients with BTS were included. Interstage reintervention rates were higher in the PDA stent cohort (48.6% vs. 15.4%,  $p < 0.001$ ).
3. This study supports the use of PDA stenting as a form of palliation in neonates with single source ductal-dependent pulmonary blood flow (SSPBF).

## Introduction

In the most recent *American Heart Association Scientific Statement*, PDA stenting in the setting of SSPBF received a Class IIb recommendation of "might be reasonable." The authors hypothesized that, SSPBF as a barrier to PDA stenting may be overcome as centers and operators gain experience with the technical approach to stenting and supporting labile neonates with a single, prostaglandin-sensitive source of pulmonary blood flow. Children's Hospital of Atlanta, Cincinnati Children's Hospital Medical Center, Texas Children's Hospital, and Children's Hospital of Philadelphia cohorts were analyzed during this study from January 2008 to December 2015.

## Methods

Patients included in the cohort had a congenital cardiac diagnosis consistent with ductal dependent SSPBF and underwent Blalock-Taussig Shunt (BTS) or PDA stent palliation in the neonatal period ( $\leq 30$  days of age). Procedural outcomes, including complications,

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length of stay (LOS), need for post-procedural inotropic support, mechanical ventilation, and diuretic use post-palliation, were collected. Branch pulmonary artery diameter (measured at the hilum) was reviewed at the time of initial palliation, as well as immediately prior to definitive surgical repair or next palliative stage (e.g., bidirectional Glenn anastomosis) using available imaging. "Reintervention" was defined as those exclusively on the PDA stent or the BTS if the reintervention occurred prior to surgical repair or planned palliation and was focused solely on the shunt or stent itself and did not involve the branch pulmonary arteries or other areas.

## Results

During the study period, 191 neonates with SSPBF underwent either PDA stent (n=35) or BTS (n=156). The baseline characteristics of the two cohorts were equivalent with a few notable exceptions. The PDA stent cohort was composed of more neonates with pulmonary atresia and intact ventricular septum (PA-IVS) compared with the BTS cohort (49% vs 28%, p=0.022). Single ventricle heart disease, presence of genetic syndrome, and pre-intervention clinical status were similar between the cohorts. Following initial palliation, ICU LOS was not different between the two cohorts (median ICU LOS 10 days

for PDA and 7 days for BTS, p = 0.341). Hospital LOS was also similar between groups (p=0.178). The PDA stent cohort was less likely to receive inotropic support (p<0.01) or to be discharged on diuretics (OR 0.45, 95% CI [0.21–0.97], p = 0.042).

## Complications and Reinterventions

Procedural complications occurred in both groups at similar rates. However, major procedural complications occurred in nine infants undergoing BTS and in no patients undergoing PDA stenting (p= 0.146). Adjusted analysis indicated no difference in overall rates of complications between PDA stent and BTS cohorts.

Reintervention was more common in the PDA stent cohort when comparing any reintervention or reintervention on the shunt or stent itself. Reintervention on the PDA stent itself was more common than on the BTS (adjusted p < 0.001). Similarly, the rate of any reintervention following initial palliation was higher in the PDA stent cohort (adjusted p < 0.001). When considering timing of reintervention, it appears that the greatest period of risk for reintervention was >1 month from initial palliation.

Table 2 Outcomes based on treatment strategy

Outcome	n	PDA stent n = 35 (18.3%)	BT shunt n = 156 (81.7%)	p
Any reintervention	191	19 (54.3%)	34 (21.8%)	<b>&lt; 0.001</b>
Reintervention on ductal stent or surgical shunt	191	17 (48.6%)	24 (15.4%)	<b>&lt; 0.001</b>
Procedural complications	191	5 (14.3%)	28 (17.9%)	0.60
Major procedural complications	191	0 (0.0%)	9 (5.8%)	0.15
Death	191	5 (14.3%)	20 (12.8%)	0.79
Age at death, days		20 (15–105) Min, max 10;189	60 (18–80) Min, max 8, 198	0.91
Diuretic use at discharge	187	18 (52.9%)	109 (71.2%)	<b>0.04</b>
Total duration of ventilation, days	190	2 (1–13)	2 (1–5)	0.59
Duration of inotrope use, days	188	0 (0–0)	2 (0–4)	<b>&lt; 0.001</b>
ECMO use post-procedure	190	2 (5.7%)	8 (5.2%)	1.00
Antiplatelet/anticoagulation use at hospital discharge	191	32 (91.4%)	144 (92.3%)	0.74
Age at definitive surgery, days	153	180 (150–214)	162 (125–200)	0.43
Time from first intervention to definitive surgery, days	158	172 (144–185)	148 (117–191)	0.41
Definitive surgical repair				
Stage 2 palliation	186	13 (39.4%)	83 (54.2%)	0.13
Complete anatomic repair		9 (27.3%)	41 (26.8%)	
Other		4 (12.1%)	6 (3.9%)	
None needed		2 (6.1%)	3 (2.0%)	
Planned but has not yet occurred		5 (15.2%)	20 (13.1%)	
PA plasty performed at definitive surgical repair	152	15 (60.0%)	54 (42.5%)	0.11
PA intervention following definitive surgical repair/staged palliation	153	3 (12.0%)	29 (22.7%)	0.23

Bold values indicate statistical significance (p < 0.05)



Table 6 Unadjusted and adjusted effects of treatment strategy on PA growth outcomes

Continuous outcome	n	Unadjusted			Adjusted
		PDA stent	BT shunt	p value	p value
<b>Model<sup>a</sup></b>					
PA symmetry index, initial	179	0.81 (0.72–0.92)	0.87 (0.79–0.95)	0.081	<b>0.02</b>
PA symmetry index, at stage II or definitive repair	166	0.88 (0.77–0.97)	0.82 (0.71–0.92)	0.059	0.86
Change in PA symmetry	160	0.07 (– 0.10 to 0.17)	– 0.06 (– 0.19 to 0.07)	<b>0.007</b>	0.45
Nakata index (mm <sup>2</sup> /m <sup>2</sup> ), initial	166	109 (70–149)	128 (96–157)	0.125	0.07
Nakata index (mm <sup>2</sup> /m <sup>2</sup> ), at stage II or definitive repair	143	158 (117–226)	148 (98–248)	0.661	0.17
Change in Nakata index	133	50 (– 29 to 131)	24 (– 28 to 113)	0.716	0.16

Bold values indicate statistical significance ( $p < 0.05$ )

### Pulmonary Artery Growth & Interventions

The pulmonary arteries were somewhat smaller pre-intervention in the PDA stent cohort (unadjusted median Nakata index 109 mm<sup>2</sup> /m<sup>2</sup>, 25th–75th 70–149) compared with the BTS cohort (unadjusted Nakata index 128 mm<sup>2</sup> /m<sup>2</sup>, 25th–75th 96–157, adjusted  $p=0.071$ ).

The increase in Nakata index from palliation to definitive repair or bidirectional Glenn was not statistically significant between cohorts. Interestingly, the branch pulmonary arteries were more asymmetric at the time of initial palliation in the PDA stent cohort (PA symmetry index 0.81, 25th–75th 0.72–0.92) compared with the BTS cohort (PA symmetry index 0.87, 25th–75th 0.79–0.95, adjusted  $p=0.016$ ). At time of surgical repair or palliation, pulmonary artery symmetry was similar, with a symmetry index of 0.88 (25th–75th 0.77–0.97) in the PDA stent cohort compared with 0.82 (25th–75th 0.71–0.92),  $p=0.857$ ). At time of definitive surgical repair or staged surgical palliation, surgical pulmonary artery plasty was common in both cohorts, with 60.0% of the PDA stent cohort and 42.5% of the BTS cohort undergoing pulmonary artery plasty.

### Discussion

Although overall complication rates were equivalent, complications were more severe in the BTS group. The group palliated with PDA stenting underwent a higher rate of reinterventions compared with the surgical BTS group. Importantly, the two palliative cohorts had similar measures of PA growth, symmetry, and size at time of definitive repair/palliation, suggesting that candidacy for surgical repair or single ventricle palliation was preserved regardless of palliative modality. The current study does not include an equal balance of BTS and PDA stent patients and does not include data on any unsuccessful PDA stent “attempts.” The late reinterventions

noted in the PDA stent cohort likely relate to the known issues of neointimal proliferation which commonly occurs in infants following PDA stenting and appears to be more common in infants with highly tortuous Type III PDAs.

### Conclusion

While PDA anatomy and the SSPBF physiology pose challenges, PDA stenting appears to offer equivalent clinical outcomes and durability as an initial palliative strategy compared with surgical BTS.



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CHIP Network  
New York City, NY, USA



## Join Our Growing Team at the Heart Institute at UPMC Children's Hospital of Pittsburgh

### UPMC CHILDREN'S HOSPITAL of PITTSBURGH

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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.

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# Nationwide Registry-Based Analysis of Infective Endocarditis After Pulmonary Valve Replacement

Stammnitz C, Huscher D, Bauer UMM, Urban A, Nordmeyer J, Schubert S, Photiadis J, Berger F, Klaassen S; German Competence Network for Congenital Heart Defects Investigators. *J Am Heart Assoc.* 2022 Mar;11(5):e022231. doi: 10.1161/JAHA.121.022231. Epub 2022 Feb 18. PMID: 35179045

Commentary from Dr. Shailendra Upadhyay

## Take Home Points

- Bovine jugular vein valves (Contegra/Melody) have the highest risk of infective endocarditis, irrespective of the mode of deployment (surgical or percutaneous)
- Male sex and higher number of previous pulmonary valve replacements increase risk of infective endocarditis

This study is the largest retrospective analysis of the German NR-CHD (National Register for Congenital Heart Defects) comparing the risk of infectious endocarditis (IE) after percutaneous pulmonary valve implantation or surgical pulmonary valve replacement in Congenital Heart Disease.

**TABLE 3** Impact Factors on the Occurrence of IE in Multivariable Cox-Regression

	HR (95% CI)	P value
All types of PVR		
Type of PVR		
Homograft	1	
Heterograft excl. Contegra	2.60 (0.91–7.43)	0.075
Contegra	6.72 (2.80–16.16)	<0.001
Melody	5.49 (2.12–14.19)	<0.001
Sex		
Female	1	
Male	1.81 (1.02–3.20)	0.044
No. of previous PVR	1.45 (1.04–2.00)	0.026
Age at study inclusion, y	1.02 (0.99–1.04)	0.141
Subgroup with Contegra or Melody		
Type of PVR		
Contegra	1	
Melody	1.01 (0.44–2.32)	0.978
Sex		
Female	1	
Male	1.34 (0.71–2.52)	0.365
No. of previous PVR	1.36 (0.92–2.02)	0.127
Age at study inclusion, y	1.02 (0.99–1.05)	0.200

HR indicates hazard ratio; IE, infective endocarditis; and PVR, pulmonary valve replacement.

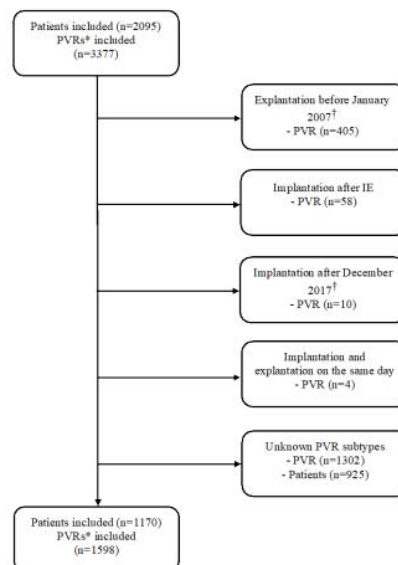
All patients with CHD with at least one surgical pulmonary valve replacement (SPVR) or percutaneous pulmonary valve replacement (PPVI) before January 1, 2018 (January 2007-Dec 2017) were included and followed up for the combined end point (grafts infected or explanted, or the patient was deceased).

The study included 1170 patients (median age 12, 5-20 years, 56% males, 68% < 18 years) that included 1598 surgical pulmonary valve replacement (SPVR) including – aortic/pulmonary homograft, heterograft including Contegra, bio-prosthetic valved conduits using Bovine/Porcine materials, mechanical valves and percutaneous pulmonary valve implantation (PPVR) including Melody and Edward Sapien valves.

Diagnoses included: Tetralogy of Fallot (TOF) – most common, Truncus Arteriosus, Aortic stenosis and s/p Ross operation. Total follow-up was 9397 years (per patient median 10 years). Clinical characteristics of patients is noted in **Table 2**.

IE occurred in 4.8% during a 10-year median follow-up (6-10 years), **Tables 1 and 2**.

**FIGURE S1** Study flow chart



Study design for the recruitment of patients with PVR in the National Register for Congenital Heart Defects, Berlin, Germany. \*Number of PVR in the patients. †Cases of pulmonary-valve-related IE were recorded during the period of January 1st, 2007 until December 31st, 2017. PVR, pulmonary valve replacement; IE, infective endocarditis; CHD, congenital heart defect.

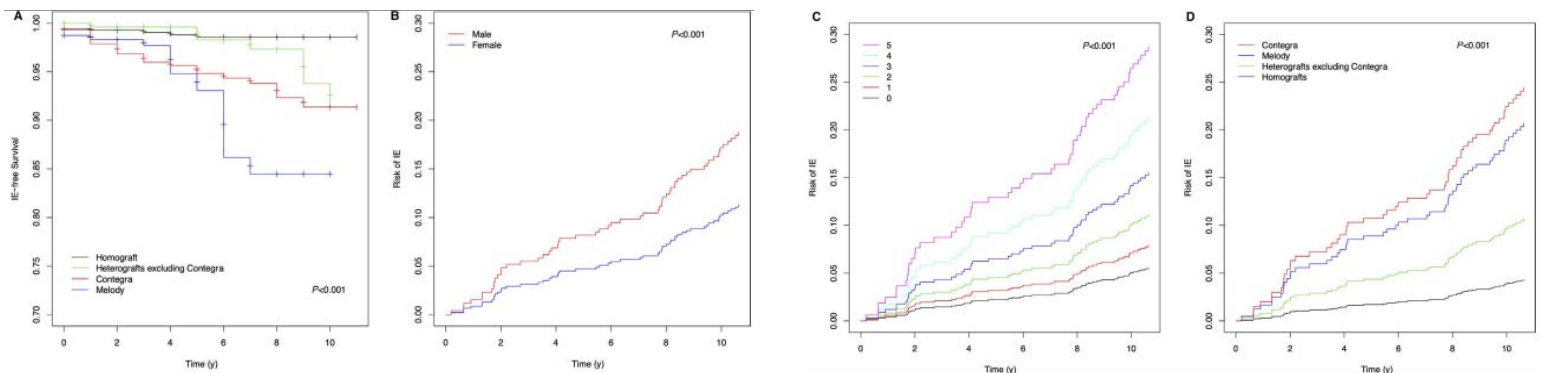


**TABLE 1** Study population

	Patients	PPVI			SPVR					P value*
		Total	Melody	Edwards Sapien	Total	Heterograft excluding Contegra	Contegra	Homograft	Mechanical valve	
No. of PVR, n (%)	1598 (100)	293 (18.3)	241 (15.1)	52 (3.3)	1305 (81.7)	278 (17.4)	445 (27.8)	558 (34.9)	24 (1.5)	
No. of patients, n (%) <sup>†</sup>	1170 (100)	279 (23.9)	230 (19.7)	52 (4.4)	1096 (93.7)	251 (21.5)	403 (34.4)	523 (44.7)	24 (2.1)	
Male sex, n (% of patients)	659 (56.3)	169 (60.6)	138 (60.0)	33 (63.5)	622 (56.8)	140 (55.8)	242 (60.0)	297 (56.8)	8 (33.3)	0.088
Age at implantation of PVR, y <sup>‡</sup>	11 (4–17)	17 (13–26)	16 (13–24)	19 (13–29)	9 (3–16)	12 (5–19)	4 (0–9)	12 (5–18)	17 (9–22)	<0.001
PVR size, mm <sup>‡</sup>	20 (17–23)	22 (20–22)	21.5 (20–22)	23 (23–26)	20 (16–23)	22 (18–25)	16 (14–20)	22 (20–24)	23 (21–25)	<0.001
IE, n (%)	56 (4.8) <sup>§</sup>	18 (6.1) <sup>§</sup>	18 (7.5) <sup>§</sup>	0	38 (2.9) <sup>§</sup>	7 (2.5) <sup>§</sup>	24 (5.4) <sup>§</sup>	7 (1.3) <sup>§</sup>	0	<0.001
Previous PVR <sup>‡</sup>	0 (0–1)	1 (1–2)	1 (1–2)	1 (1–2)	0 (0–1)	0 (0–1)	0 (0–1)	0 (0–1)	0 (0–1)	<0.001
Age at first PVR, y <sup>‡</sup>	5 (0–14)	4 (0–12)	4 (0–11)	10 (0–18)	5 (0–14)	6 (0–17)	1 (0–6)	6 (1–15)	11.5 (4–19)	<0.001
Age at study inclusion, y <sup>‡</sup>	12 (5–20)	13 (8–20)	13 (8–20)	13.5 (8.5–24)	12 (5–20)	12 (5–19)	5 (1–10)	16 (9–22)	22.5 (17–32)	<0.001
<18 y at study inclusion, n (%)	792 (67.7)	191 (68.5)	160 (69.6)	32 (61.5)	749 (68.3)	174 (69.3)	372 (92.3)	294 (56.2)	7 (29.2)	
≥18 y at study inclusion, n (%)	378 (32.3)	88 (31.5)	70 (30.4)	20 (38.5)	347 (31.7)	77 (30.7)	31 (7.7)	229 (43.8)	17 (70.8)	
Follow-up, y <sup>‡</sup>	10 (6–10) <sup>  </sup>	4 (2–6) <sup>  </sup>	4 (2–6) <sup>  </sup>	3.5 (2–5) <sup>  </sup>	6 (3–10) <sup>  </sup>	5 (2–8) <sup>  </sup>	5 (2–8) <sup>  </sup>	7 (4–10) <sup>  </sup>	10 (8–10) <sup>  </sup>	<0.001
Patient-years of follow-up	9397 <sup>  </sup>	1180 <sup>  </sup>	1001 <sup>  </sup>	179 <sup>  </sup>	7553 <sup>  </sup>	1423 <sup>  </sup>	231 <sup>  </sup>	3613 <sup>  </sup>	206 <sup>  </sup>	

IE indicates infective endocarditis; PPVI, percutaneous pulmonary valve implantation; PVR, pulmonary valve replacement; and SPVR, surgical pulmonary valve replacement.  
<sup>†</sup>Melody, Edwards Sapien, heterografts excluding Contegra, Contegra, homografts, and mechanical valves were compared.  
<sup>‡</sup>Some patients had different pulmonary valve replacement over the observation period.  
<sup>§</sup>Median (interquartile range).  
<sup>||</sup>The pulmonary valve replacement size was known in 1247 (78.0%) of 1598 pulmonary valve replacement.  
<sup>||</sup>Calculated based on the number of patients.  
<sup>||</sup>Calculated based on the number of pulmonary valve replacement.

**FIGURE 1** Survival free from infective endocarditis (IE)



**TABLE S4** Impact factors on the occurrence of IE in univariable Cox-regression

Subgroup	All patients		Female sex		Male sex		Patients <18 years at study inclusion		Patients ≥18 years at study inclusion	
	HR (95% CI)	P-value	HR (95% CI)	P-value	HR (95% CI)	P-value	HR (95% CI)	P-value	HR (95% CI)	P-value
<b>Type of PVR</b>										
Homograft	1		1		1		1		1	
Heterograft Excl. Contegra	2.60 (0.91-7.43)	0.074	2.44 (0.15-39.06)	0.528	2.76 (0.89-8.58)	0.079	3.14 (0.89-11.15)	0.076	1.19 (0.12-11.41)	0.883
Contegra	5.62 (2.42-13.07)	<0.001	13.55 (1.69-108.48)	0.014	4.25 (1.65-10.91)	0.003	5.12 (1.75-14.97)	0.003	8.06 (1.63-39.98)	0.011
Melody	7.81 (3.20-19.05)	<0.001	22.90 (2.78-188.30)	0.004	5.01 (1.79-14.01)	0.002	6.05 (1.89-19.40)	0.002	12.05 (3.00-48.32)	<0.001
PVR size (mm) *	0.97 (0.89-1.04)	0.371	0.95 (0.82-1.11)	0.545	0.96 (0.88-1.06)	0.417	1.02 (0.93-1.12)	0.610	0.85 (0.65-1.11)	0.233
<b>Sex</b>										
Female	1		-		-		1		1	
Male	1.95 (1.10-3.44)	0.022	-		-		2.03 (1.02-4.04)	0.044	1.57 (0.54-4.51)	0.407
Number of previous PVR	1.63 (1.23-2.17)	<0.001	1.41 (0.82-2.40)	0.214	1.71 (1.22-2.39)	0.002	1.71 (1.21-2.42)	0.002	1.39 (0.79-2.45)	0.255
Age at study inclusion, yrs	0.99 (0.97-1.02)	0.569	1.01 (0.97-1.05)	0.586	0.99 (0.96-1.02)	0.450	-		-	
<18	1		1		1		-		-	
≥18	0.63 (0.86-2.89)	0.139	0.81 (0.46-3.35)	0.674	0.62 (0.75-3.53)	0.222	-		-	

IE, infective endocarditis; PVR, pulmonary valve replacement; n.a., not applicable; HR, hazard ratio; CI, confidence interval. \*PVR size was known in 1247/1598 PVR.



FIGURE 2 Characteristics of patients with IE after PVR

	Patients	Melody	SPVR			P value*	
			Total	Heterograft excluding Contegra	Contegra		Homograft
Patients with IE/patients with PVR, n (%)	56/1170 (4.8)	18/230 (7.8)	38/1096 (3.5)	7/251 (2.8)	24/403 (6.0)	7/523 (1.3)	
PVR with IE/ number of PVR, n (%)	56/1598 (3.5)	18/241 (7.5)	38/1305 (2.9)	7/278 (2.5)	24/445 (5.4)	7/558 (1.3)	
Male sex, n (% of patients)	39 (69.6)	11 (61.1)	28 (73.7)	6 (85.7)	16 (66.7)	6 (85.7)	0.579
PVR size, mm <sup>†‡</sup>	20 (18–22)	19 (18–22)	20 (17–22)	25 (20–26)	20 (16–20)	21.5 (16.5–23)	0.071
Age at implantation of PVR, y <sup>†</sup>	13.5 (9–20)	16 (14–24)	11 (5–18)	18 (9–22)	9 (4–12)	18 (12–21)	0.002
Age at IE, y <sup>†</sup>	16.5 (13–24)	21.5 (16–29)	15 (11–21)	23 (13–27)	13 (9–18)	19 (12–32)	0.004
Time between PVR and IE, y <sup>†</sup>	4 (1–6)	5 (2–6)	3 (1–7)	5 (2–11)	3 (1–6)	0 (0–5.5)	0.231
Time between IE and next PVR, mo <sup>†</sup>	2 (0–8)	0 (0–2)	3 (0–12)	2 (0–25)	3 (0–12)	6 (1–26)	0.193
Previous PVR <sup>†</sup>	1 (0–2)	1 (1–2)	0 (0–1)	1 (0–2)	0 (0–1)	0 (0–2)	0.006
Age at first PVR, y <sup>†</sup>	3.5 (0–12)	2.5 (0–9.5)	6 (0–12)	9 (1–16)	4 (0–10)	12 (0–21)	0.437
Time between first PVR and IE, y <sup>†</sup>	11 (3–16)	18 (13.5–21)	7.5 (2–13)	13 (7–15)	4 (2–11)	5.5 (0–15)	<0.001
Age at study inclusion, y <sup>†</sup>	12 (7–18)	14.5 (10–21.5)	10.5 (4.5–16)	16 (9–17)	9 (3–13)	12 (7–30)	0.039
<18 y at study inclusion, n (%)	42 (75.0)	11 (61.1)	31 (81.6)	6 (85.7)	21 (87.5)	4 (57.1)	
≥18 y at study inclusion, n (%)	14 (25.0)	7 (38.9)	7 (18.4)	1 (14.3)	3 (12.5)	3 (42.9)	
Pathogen <sup>§</sup>							0.014 <sup>  </sup>
Staphylococci, n (%)	18 (32.1)	11 (61.1)	7 (18.4)	1 (14.3)	4 (16.7)	2 (28.6)	
Streptococci, n (%)	15 (26.8)	5 (27.8)	10 (26.3)	3 (42.9)	7 (29.2)	0	
Other pathogens, n (%)	8 (14.3)	1 (5.6)	7 (18.4)	2 (28.6)	4 (16.7)	1 (14.3)	

IE indicates infective endocarditis; PVR, pulmonary valve replacement; and SPVR, surgical pulmonary valve replacement.

\*Melody valves, heterografts excluding Contegra, Contegra valves, and homografts, were compared.

<sup>†</sup>Median (interquartile range).

<sup>‡</sup>The pulmonary valve replacement size was known in 35 (62.5%) of 56 pulmonary valve replacements.

<sup>§</sup>Negative blood culture in one case (heterograft), and not available in 14 (25.0%) cases (4 homografts, 1 heterograft excluding Contegra, 8 Contegra valves,

1 Melody valve).

<sup>||</sup>Staphylococci were compared with other pathogens.

IE After homograft 1.3%; IE After heterograft 4.3% [Heterograft non Contegra 2.5% and Contegra 5.4%]; IE After Melody 7.5%. IE showed no significance influence on the overall survival of the patients (IHR, 3.57; P=0.20).

Bovine jugular vein valves (Contegra and Melody) had the highest risk of IE, **Table S4**, irrespective of the mode of deployment, either surgical or percutaneous. In the multivariable analysis, the risk of IE was increased in the male sex, in patients with a higher number of previous pulmonary valve replacement and for bovine jugular vein valves (with a similar risk for Melody versus Contegra valves), **Table 3**.





## Conclusion

- Homograft or non Contegra heterograft replacement has the least risk of IE.
- Bovine jugular valves (Contegra/Melody) have the highest risk of IE whether deployed surgically or percutaneously.
- Male sex and higher number of previous PVR add significant IE risk.
- Other significant risk factors for IE are male sex and higher numbers of previous PVR.
- The Edwards-Sapien valve may be useful for PPVI in high-risk subgroups for IE, however data are limited.



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*This [article](#) was originally published by the CHiP Network,  
[Nationwide Registry-Based Analysis of Infective Endocarditis Risk After Pulmonary Valve Replacement.](#)*



**SHAILENDRA UPADHYAY, MD**

Section editor of *ACHD Journal Watch*  
CHiP Network  
Connecticut, USA



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# Pediatric Cardiologist Faculty Position

UC Davis Children's Hospital, School of Medicine, Department of Pediatrics Cardiology

The Department of Pediatrics at the University of California, Davis School of Medicine is recruiting a full-time Pediatric Cardiologist. We are recruiting at the Assistant Professor rank in the Clinical Pediatrics or Health Sciences Clinical Series in the Division of Pediatric Cardiology.

The candidate's primary clinical duties include: 1) general outpatient pediatric cardiology in our clinic as well as in an outreach setting, 2) inpatient consult service, 3) supervise and interpret pediatric echocardiograms and EKG's. Optional skillsets may include ability to perform and interpret transesophageal and fetal echocardiograms, management of cardiomyopathies and heart failure. Work distribution will depend on the specific skillset of the candidate. It is expected that the candidate will share in the on-call and weekend/holiday coverage schedule.

In addition to the clinical responsibilities, the ideal candidate will be expected to participate in teaching of medical students, residents and fellows, research activities of the Department of Pediatrics, and serve on departmental committees. A background and/or interest in research or quality improvement is preferred.

Candidates must have the following experience/qualifications:

- M.D. or D.O.
- Successful completion of an approved pediatric residency training program
- Successful completion of an approved Pediatric Cardiology fellowship training program at this hire
- Board certification/eligibility in Pediatric Cardiology
- Eligibility for a California Medical License
- Ability to foster collegiality and work collaboratively in a diverse environment

The Pediatric Heart Center at UC Davis Children's Hospital is inland Northern California's only full-service facility for children and young adults with congenital and acquired heart disease offering the most advanced testing and treatments for a range of congenital or acquired cardiovascular conditions. Our integrated multidisciplinary team of 2 CHD surgeons, 8 Pediatric Cardiologists and 5 Nurse Practitioners/PAs along with other pediatric subspecialists and researchers offer Northern California's most sophisticated and specialized expertise in cardiac imaging, diagnostic, interventional, hybrid procedures and cardiac surgery. Other specialized cardiac services of the Program include echocardiography (including fetal, transesophageal, IVUS, and intracardiac), exercise stress testing, electrophysiology testing, radiofrequency and cryoablation and pacemaker services. The CHD program also has an advanced interventional/hybrid fellowship. Other advanced subspecialty cardiac clinics offered include cardiomyopathy and heart failure, pulmonary hypertension, adult congenital heart disease, and interstage for single ventricle infants. To provide more flexibility, accessibility, and timely care for pediatric cardiology patients, the Pediatric Heart Center treats patients in both Sacramento and throughout Northern California at various outreach sites.

Completed applications include CV, Cover Letter, Statement of Teaching, Statement of Contributions to Diversity, Equity, and Inclusion and contact information for 3-5 references. Candidates should submit their application online at: <https://recruit.ucdavis.edu/apply/JPF05343>.

With more than 120 physicians in 33 pediatric subspecialties, the Children's Hospital is a 121- bed hospital housed within the 619-bed University of California, Davis Medical Center. It is the only designated Children's Hospital in the Sacramento region, and is known for offering comprehensive, compassionate, family-centered care. UC Davis Children's Hospital is distinguished for its outstanding congenital heart program and its internationally recognized telemedicine programs. UC Davis Children's Hospital has a 49-bed level 4 Neonatal Intensive Care Unit and a new 24-bed Pediatric Intensive Care Unit/Pediatric Cardiac Intensive Care Unit. UC Davis Medical Center is a Baby-Friendly designated birth center.

The UC Davis Children's Hospital is based on the UC Davis Health campus in Sacramento, California and serves a population of over 1 million children in the Northern California, Central Valley and Western Nevada regions. Sacramento is an easily accessible, family-oriented city in close proximity to the San Francisco Bay area, Lake Tahoe and the Sierra Nevada Mountains, the California coast, and Napa Valley.

UC Davis commits to inclusion excellence by advancing equity, diversity and inclusion in all that we do. We are an Affirmative Action/Equal Opportunity employer, and particularly encourage applications from members of historically underrepresented racial/ethnic groups, women, individuals with disabilities, veterans, LGBTQ community members, and others who demonstrate the ability to help us achieve our vision of a diverse and inclusive community. For the complete University of California nondiscrimination and affirmative action policy see: <http://policy.ucop.edu/doc/4000376/NondiscrimAffirmAct>. If you need accommodation due to a disability, please contact the recruiting department.

Under Federal law, the University of California may employ only individuals who are legally able to work in the United States as established by providing documents as specified in the Immigration Reform and Control Act of 1986. Certain positions funded by federal contracts or sub-contracts require the selected candidate to pass an E-Verify check. More information is available <http://www.uscis.gov/e-verify>.

UC Davis is a smoke & tobacco-free campus (<http://breathefree.ucdavis.edu/>).



# PICS Society Symposium 2022 Chicago: Highlights

Kamel Shibbani, MD

This month we would like to celebrate the success of our recent 25<sup>th</sup> Anniversary PICS Symposium in the windy city of Chicago. We would like to revisit some of the highlights of that milestone event this past September at this eagerly anticipated "back together again" and VERY well-attended meeting!

Preceding the meeting, Drs. Vivian Dimas and Darren Berman led the second annual PICS Fellows and Early Career (FEC) course, an intensive two-day session that provided tomorrow's future leaders opportunities to complement the training received at their home institutions, hone their skills on a variety of simulators, network with their peers and much more. This unique course has quickly become a 'must attend' event for all CHD interventionalists in-training or early in their careers.

Dr. Hijazi then began the Symposium's 25<sup>th</sup> Anniversary with a welcome speech that highlighted developments with the meeting and with the PICS Society overall. He noted the importance of attendees joining the PICS Society and taking advantage of important membership benefits:

1. Free subscription to the Society's official journal, *Pediatric Cardiology* (thank you Editor-In-Chief Dr. Karim Diab)
2. Free membership in the highly successful PICS/CCISC DocMatter Community (thank you B. Braun Interventional Systems Inc. and NuMED)
3. Opportunities for committee service
4. Free subscription to our official News & Information partner, *Congenital Cardiology Today*

New this year to PICS was a dedicated Lymphatics Session chaired by Dr. Yoav Dori. This exciting new field has the potential to dramatically increase options for treating our patients. A half-day just scratched the surface BUT was an important beginning. Watch for much more to come.

The meeting continued the tradition of live cases with excellent educational cases from Chicago, Ohio, Minnesota, Canada, Qatar, and for the first time (and very proudly so) from Egypt (thank you Dr. Maiy H. El Sayed). The conference included six main sessions and ten breakout sessions, with topics spanning the spectrum from fetal interventions and neonates to Adult Congenital Heart Disease.

Day one, cases filled the morning schedule while the main afternoon session focused on imaging with updates on 3DRA, CT Image Guidance for Transthoracic Pulmonary Vein Recanalization, and Integrating CT into Cath Interventions. The afternoon also included a well-attended breakout session on "Things we Have Always Wanted in Our Toolbox That May Actually Almost be Here," as well as important talks from the FDA covering regulatory considerations past, present and potentially in the future. Oral abstracts concluded the first day, followed by a PICS Society Welcome Reception for networking and renewing old friendships after so many months of Zooming!

The second day at the PICS Society Symposium 2022 continued with a busy and informative program. Live case transmissions continued in the morning from nearby institutions in Chicago. Our industry partners put forth lunch symposiums that focused on special devices and techniques, before the afternoon sessions of the second day began. The much-awaited lymphatic session took the lion's share of the second afternoon. Breakout sessions also included topics on: complication prevention in the cath lab, nuances of newly approved devices, a PICES session, and the breakout for our always popular Spanish/Latin session. The PICS Lifetime Achievement Awards concluded the second day, with Drs. Mazeni Alwi, Bharat Dalvi and Carlos Pedra all recognized for their outstanding achievements in the field.

Day three started with a presentation from the Executive Director of the PICS Society, Norm Linsky. He updated attendees as to how, during its short existence, the Society has become the "must join" organization for our global community, in partnership with the many outstanding national and regional societies throughout the world. We then shifted gears to live cases from Ohio and Minnesota, followed by our third-day afternoon sessions. These afternoon sessions covered topics from new transcatheter interventions in Fontan patients to non-cardiac interventions, structural interventions for congenital patients, as well as coarctation from the neonate to the adult. Breakout sessions also included a Nursing and Associated Professionals dedicated session.

The day ended on a very collegial note at the PICS Society social event. We paid special tribute to the winners of the "Young Investigator Award," Drs. Borik and Salavitabar, as well as a special award to our Senior Patient Advocate, Mrs. Natalie Poli. Congratulations to you all!

## SAVE THE DATES

### TWO Exciting PICS Meetings in 2023

#### PICS Istanbul

March 15<sup>th</sup> – 18<sup>th</sup>, 2023

in partnership with the Turkish Society/  
Association of Pediatric Cardiology and Cardiac  
Surgery, and with the Interventional Pediatric  
Cardiology (IPC) meeting led by  
Dr. Mario Carminati.

[www.picsistanbul.com](http://www.picsistanbul.com)

#### PICS 26<sup>th</sup> Annual Symposium

August 27<sup>th</sup> – September 1<sup>st</sup>, 2023

in Washington DC, embedded within the 8<sup>th</sup>  
World Congress of Pediatric Cardiology and  
Cardiac Surgery.

[www.wcpccs2023.org](http://www.wcpccs2023.org)



# Pediatric Interventional Cardiology Opportunity

**Children's Hospital of Michigan** is the leader in treating the most children for inpatient cardiovascular care in the Metropolitan Detroit area. With an extensive team of 20 attendings and a dedicated nursing staff, the Pediatric Cardiologists and Pediatric Cardiovascular surgeons at Children's Hospital of Michigan provide a full range of advanced cardiac services for newborns, infants, children, and adolescents with congenital or acquired 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 rankings**. 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 experienced Pediatric Interventional Cardiologist to join our robust program.

- Full-time, employed opportunity – Available immediately
- On service 4-6 weeks per year (Cardiology service)
- Work week is comprised of 2 days in the cath lab, 1 day of clinic, and 1 administrative day; teaching required
- Shared call of 1:3 with two other Interventional Cardiologists for the cath lab rotation
- Dedicated nursing staff of five with one that is designated 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
- Additionally, we have a tremendous research opportunity to work on cardiovascular interventional research for CCISC, a non-profit organization dedicated to the advancement of the science and treatment of infants, children, and adults requiring surgical/interventional procedures for the treatment of congenital heart disease.

## Candidate Requirements:

- MD or DO degree required
- Board certification required
- 1-2 years of advanced fellowship in Cardiac Cath Intervention preferred
- 3-5 years of experience required
- 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
- Please note: Unfortunately, we are unable to sponsor J1 waivers at this time. H1b visas are considered on an individual basis.

## How to Apply:

Interested candidates should submit a CV for immediate consideration.

**Chris Belton**  
**Physician Sourcing Specialist, Tenet Health Corporation**  
**469.893.6577**  
[Chris.Belton@tenethealth.com](mailto:Chris.Belton@tenethealth.com)



The final day started with a major focus on our fastest growing patient population: patients with Adult Congenital Heart Disease. The discussion ranged from risk and risk mitigation to performing the reverse Potts shunt, simulation in ACHD interventions, integration of advanced imaging platforms in ACHD interventions, difficult decision making in ACHD interventions and learning curves with new valve technologies in the RVOT. A breakout session covered decisions made in the cath lab involving transcatheter pulmonary valves, COA intervention, PDA stenting, RVOT stenting and pulmonary vein interventions. A session about pmVSD followed, as well as several taped cases. Saving the best for last, the PICS Society's favorite "My Nightmare Case in the Cath Lab" concluded the academic activities for the 2022 PICS Society Symposium.

As in years past, highlights of several key sessions will be available online at [CHDInterventions.org](https://CHDInterventions.org). Watch your email for an update.

In addition to the formal program, the PICS Symposium is increasingly becoming

THE place for your profession to conduct important business. As such, several of the Society's many committees and working groups met and planned future activities. This year the PICS Humanitarian Working Group, the Education Committee, the Working Group on Regulatory Reform and others held highly productive meetings onsite – watch for updates in future columns in CCT.

This meeting would not have been possible without the visionary support of our industry partners, which will be acknowledged separately. Thank you!

We look forward to seeing you in August 2023 at the 26<sup>th</sup> Annual PICS Symposium as we begin our next quarter century! Also be sure to keep in mind PICS Istanbul in March 2023. As always, PICS is committed to excellence in professional education and "news you can use," along with ample opportunities to learn, network, and most importantly, advance our ability to treat the patients we are honored to serve.



Course Co-Director Dr. Dan Levi leading one of the many hands-on sessions at the Fellows/Early Career Course.



Course Co-Director Dr. Gregor Krings and Ms. Inês Silva, DocMatter Clinical Engagement Specialist. Inês was awarded the PICS Certificate of Special Recognition – congratulations and thank you, Inês!



Sir Dr. Shakeel Qureshi (on left), Dr. Francisco Garay (center) celebrating the induction of Dr. Francisco Garay as a NEW Fellow of the PICS Society (FPICS). Congratulations to Dr. Garay and the many others welcomed into the Society in Chicago.



## Congenital Heart Surgeon

### Primary Purpose of Organizational Unit

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

### OUR VISION

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

### OUR MISSION

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

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

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

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

### Position Summary

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

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

### Minimum Education and Experience Requirements

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

### Preferred Qualifications, Competencies, and Experience

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

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

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



# Heart Rhythm Society Announces Semi-Finalists in First-Ever HRX Pitch Competition

## *Five Early-Stage Companies Shared Emerging Research and Innovations in Cardiovascular Digital Health*

The Heart Rhythm Society (HRS) announced they will showcase innovation and science from five early-stage innovators as part of the HRX 2022 meeting. The Breakthrough Innovations in Cardiovascular Digital Health pitch competition were made possible by an in-kind donation and in collaboration with The Massachusetts Medical Device Development Center.

The semi-finalist teams advanced to the live pitch competition following a selection process review by a panel of five cardiovascular digital health experts. The top three teams will each earn monetary awards: 1<sup>st</sup> place: \$30,000, 2<sup>nd</sup> place: \$15,000, and 3<sup>rd</sup> place: \$10,000.

“With the design of HRX, the Heart Rhythm Society aims to aid and champion organizations making a difference via innovations in digital health,” said pitch competition moderator, G. Stuart Mendenhall, MD, FHRS, a cardiac electrophysiologist at Scripps Memorial Hospital in La Jolla, CA. “This arena is a rapidly growing and increasingly important aspect of cardiovascular care, and we aim to help this technology become implemented to improve patient health, improve outcomes, and reduce the costs of heart disease to society.”

The five pitch teams will present timely digital health innovations focused on cardiovascular care, with an emphasis on artificial intelligence (AI) and consumer wearables:

- **Anumana:** AI-based electrocardiogram to serve

as a deep predictive tool and biomarker of disease

- **General Prognostics (GPx):** The world's first bloodless blood test aiming to eradicate preventable heart failure readmission
- **Relay Response:** Medical software deployed on consumer smartphones and smartwatches for rescuers performing CPR
- **ReadMyRhythm (RMR):** A cloud-based, digital healthcare platform that will identify and diagnose cardiac arrhythmias in consumers with wearable devices
- **TeleHealth Care Solutions LLC (TCS):** VPEXam Virtual Care tool to reduce morbidity and mortality in complex cardiac patients

“The Breakthrough Innovations pitch competition embodies the spirit of HRX – we’re convening in San Diego to accelerate innovation and transform cardiovascular patient care,” said Dr. Ki Chon, Krenicki Chair Professor and Head of Biomedical Engineering at University of Connecticut, who will be serving as one of five pitch competition judges. “Of course, this ambitious goal requires inventive thinking, collaboration, inspiration, and in many instances, funding.”

Congratulations to the 2022 HR Pitch Competition Awardees:

- **First Place:** Relay Response
- **Second Place:** VPEXam
- **Third Place:** Anumana

### About the Heart Rhythm Society

The Heart Rhythm Society (HRS) is the international leader in science, education, and advocacy for cardiac arrhythmia professionals and patients and is the primary information resource on heart rhythm disorders. Its mission is to improve the care of patients by promoting research, education, and optimal health care policies and standards. Its mission is to eliminate death and suffering due to heart rhythm disorders. Incorporated in 1979 and based in Washington, D.C., it has a membership of more than 7,500 heart rhythm professionals in more than 90 countries around the world. For more information, visit [www.HRSonline.org](http://www.HRSonline.org).



# NEONATOLOGY TODAY

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**THE OHIO STATE UNIVERSITY**  
COLLEGE OF MEDICINE

## Cardiac Critical Care Faculty

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

Candidates must have completed fellowship training in pediatric cardiology and/or critical care that included advanced cardiac intensive care training. Preference will be given to those who are boarded in pediatric cardiology and interested in an academic center with research and leadership opportunities for the candidate's professional growth.

The successful applicant will join a group of nine multi-background academic cardiac intensivists and twelve dedicated nurse practitioners devoted to the CTICU, providing 24/7 in house coverage. Our free-standing CTICU is a 20 bed unit with 600 admissions per year (medical and surgical); an average daily census of 12. The Heart Center's comprehensive services include hybrid palliation, comprehensive single ventricle program, thoracic organ transplantation, blood conservation strategies, and cardiac mechanical support. Current annual clinical metrics include: over 400 cardiothoracic surgeries, over 700 cardiac catheterizations and EP procedures, and over 20,000 cardiology outpatient visits. We have a pediatric and pediatric/adult combined cardiology fellowship programs.

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

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

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

To learn more about Nationwide Children's or apply for this position visit us at: [NationwideChildrens.org/physician-careers](https://www.nationwidechildrens.org/physician-careers)

Candidates may submit their curriculum vitae by email to:

**Janet Simsic, MD**

**Director, Cardiothoracic Intensive Care Unit**

[Janet.Simsic@nationwidechildrens.org](mailto:Janet.Simsic@nationwidechildrens.org) or

**Robert Gajarski, MD, MHSA**

**Section Chief, Pediatric Cardiology**

**The Heart Center at Nationwide Children's Hospital**

[Robert.Gajarski@NationwideChildrens.org](mailto:Robert.Gajarski@NationwideChildrens.org)

All inquiries and referrals will remain confidential.





# A New CARE Collaborative Project

The Coronary Anomalies Research and Education (CARE) Collaborative has been busy. We have some exciting news to share with you about the anomalous aortic origin of a coronary artery (AAOCA) project funded by PCORI!

As a reminder, the **CARE Collaborative** is a group of clinicians, research investigators, and patients/families from University of Texas at Austin, Boston Children's Hospital, Children's Hospital of Philadelphia, and Texas Children's Hospital studying AAOCA. As you know, patients with AAOCA are at an increased risk of **sudden cardiac death**, especially during exercise. The mechanism of sudden cardiac death, the risk for individual patients, and the effectiveness of different therapies are unknown. These uncertainties result in anxiety for patients and families. To date, there has been no patient, family, nor provider engagement to define research priorities and the most relevant outcomes to be measured in this vulnerable population.

Since the inception of this collaborative, our main goal has been to **identify and prioritize patient-centered questions and gaps in care considered to be the most critical by patients and families**. Over the course of this funding period, we have been working towards that goal by disseminating surveys to identify questions and gaps that matter most to our patients and providers.

As we get closer to the final few stages of having the most pertinent questions identified, we would like you – our stakeholders and partners – to join us on this journey!

**Here's how we hope you and your organization will continue to be involved:**

1. **Attend our stakeholder engagement virtual meeting (Date TBD – early January expected)** to learn more about the research process so far and upcoming next steps. This is aimed to be informal and more as an opportunity for a conversation on what we have been up to, how we hope to disseminate our findings and, perhaps more importantly, hear from you how we can apply what we have learned in a broader way in other conditions that may lead to sudden death in the young (among others).
2. **Attend our final dissemination webinar** to be informed on the findings from the analysis and the final list of unanswered questions about AAOCA in early 2023.

We hope you will join us on our journey to identify unanswered questions by creating a focused and intentional research agenda for these patients and families while also addressing gaps in the AAOCA community!

Please, do not hesitate to reach out if you have any questions. Looking forward to connecting soon!

*The CARE Collaborative*

Contact: Silvana Molossi at [smolossi@bcm.edu](mailto:smolossi@bcm.edu)



**Children's National**

## Faculty Position

Children's National Hospital in Washington, DC is currently recruiting an outstanding candidate for a faculty position at our outpatient cardiology center in Richmond, VA. The successful candidate must be board-certified or board-eligible in pediatric cardiology with post-graduate training and/or experience in general pediatric cardiology. Candidates would be expected to provide the full spectrum of cardiac care including electrocardiograms, echocardiograms, stress tests, and Holter monitoring as well as inpatient cardiology services and teaching at regional community hospitals. Our Richmond office sits adjacent to Henrico Doctor's Hospital, which houses a Level III NICU and works closely with the PICU at nearby Chippenham Hospital. There is also an opportunity to provide fetal echocardiography in collaboration with our fetal heart program.

The city of Richmond is ideally located in central Virginia providing a well-balanced mix of urban life wrapped in Southern charm. The city and its suburbs provide a great quality of life with reasonable cost of living. Richmond offers a wide range of culture and activities for any individual or family. In 2 hours or less, there are beaches to the east, scenic mountains to the west, and Washington, DC to the north.

As part of the Children's National Heart Institute, the candidate would be a part of a division that includes Cardiology, Cardiovascular Surgery, Cardiac Intensive Care and Cardiac Anesthesia. There are currently nearly 40 pediatric cardiologists and 4 pediatric cardiac surgeons, with dedicated ACHD, echocardiography and cardiac MRI/CT, interventional cardiology, and electrophysiology expertise. Our Institute takes care of more than 20,000 patients yearly. There is a state-of-the-art CICU with 26 beds and new Tele-CICU Command Center, a specialized Cardiac Procedure Recovery Unit. We perform inpatient and telemedicine consultations at over 20 regional hospitals and have outpatient centers at 18 sites in the District of Columbia, Maryland, and Virginia.

Consistently ranked among the top 10 pediatric hospitals in America, Children's has been serving the nation's children for 150 years. Children's National is proudly ranked among the best pediatric hospitals in America by US News & World Report and the Leapfrog Group and is a designated Nursing Magnet Hospital. Our hospital sponsors 16 ACGME approved residencies and fellowships including a top ranked pediatric residency program, with over 6,000 employees, including our 300+ bed main campus.

Children's is an equal opportunity employer and encourages applications from a diverse group of candidates.

**Please send inquiries & curriculum vitae to:**

**Charles Berul, MD**

Chief of Cardiology and Co-Director of the Heart Institute  
[cberul@childrensnational.org](mailto:cberul@childrensnational.org)

**Craig Sable, MD**

Associate Chief of Cardiology  
[csable@childrensnational.org](mailto:csable@childrensnational.org)



## Asst/Assoc/Professor of Pediatric Cardiology

The **Department of Pediatrics of the University Of Illinois College Of Medicine at Peoria (UICOMP)** seeks **Pediatric Cardiac Electrophysiology** candidates for a **pediatric cardiology faculty position**.

This cardiologist will work primarily at **OSF Healthcare Children's Hospital of Illinois**. The candidate must hold an MD/DO degree, be board-certified or board-eligible in pediatric cardiology, and hold or be eligible for an Illinois physician license. Candidates must have completed residency & fellowship training. Additional training and/or extensive experience in pediatric and congenital cardiac electrophysiology, invasive and non-invasive, is required.

The candidate will join a well-established team of 10 pediatric cardiologists, 2 pediatric cardiovascular surgeons, 4 advanced practice providers, and EP nursing. Professional efforts will be bolstered by state-of-the-art facilities, including EP lab. Excellent collaboration exists among pediatric subspecialists as well as adult cardiology colleagues. UICOMP supports a thriving education program with medical students, residents, and fellows.

### Position Summary:

Clinical activities will include outpatient clinics, inpatient rotation, and procedural time. Travel to outreach clinics located in surrounding community cities is required. Inpatient and procedural care is provided at OSF Healthcare Children's Hospital of Illinois (CHOI). Clinical activities of this faculty member will be at the full time assistant/associate/professor rank based on the experience of the candidate.

### Duties & Responsibilities:

- Patient care duties including inpatient, outpatient and interventional.
- Satellite clinics in the region.
- Device checks both in person and remote.
- On-call duties for pediatric cardiology and electrophysiology.
- Teaching of medical students, residents, and fellow.
- Academic efforts including original research and QI.
- Administrative efforts related EP program.

Malpractice insurance is provided by the University of Illinois system and an excellent benefits package available including vacations, sick time, CME, health and life insurance and retirement plan.

### Minimum Qualifications:

- MD/DO or foreign equivalent.
- Eligible for licensure in Illinois.
- BC/BE in Pediatric Cardiology.
- 3 years pediatric residency/3 years pediatric cardiology fellowship or equivalent.
- Significant experience or formal training in Pediatric Cardiac Electrophysiology (invasive and non-invasive).

**For fullest consideration, submit your application by 1/15/23 to:**  
<https://uic.csod.com/ux/ats/careersite/1/home/requisition/1806?c=uic>

*The University of Illinois System is an equal opportunity employer, including but not limited to disability and/or veteran status, and complies with all applicable state and federal employment mandates. Please visit [Required Employment Notices and Posters](#) to view our non-discrimination statement and find additional information about required background checks, sexual harassment/misconduct disclosures, COVID-19 vaccination requirement, and employment eligibility review through E-Verify.*

[Request an Accommodation](#)



# Atrium Health Sanger Heart & Vascular Institute Using New Technology to Preserve Donor Hearts for Lifesaving Transplants

## *New System Keeps a Donated Heart Beating as it's Transported*

Atrium Health Sanger Heart & Vascular Institute's heart transplant team is using new technology to keep hearts viable while being transported to a waiting heart transplant recipient. The portable technology, called the TransMedics Organ Care System (OCS), expands the amount of time a donated heart can be suitable for transplant, helping make more donated hearts available for those who need them.

"Once a heart is removed from a deceased donor due to cardiac death, the portable system revives the heart and keeps it beating, infusing it with blood from the donor that is supplemented with nutrients and oxygen," said Dr. Eric Skipper, a cardiothoracic heart transplant surgeon at Atrium Health Sanger Heart & Vascular Institute. "The system also allows us to carefully assess the heart's functional quality and viability for transplant before we reach the operating room to perform the transplant."

According to Skipper, OCS eliminates the time restraints that can require turning down a donated heart. Previously, the Sanger Heart & Vascular Institute transplant team could only accept donor hearts from within a 500-mile radius. That's because there is a 4-hour cold storage limitation for the organ and the travel time between the deceased donor and a patient waiting for a transplant in Charlotte would exceed that. Now, with the use of the new technology, the donor pool has expanded because the heart can be kept viable for up to eight hours and be received from up to 1,000 miles away. It also allows for the acceptance of higher-risk hearts, including those from older donors and donors who are initially put on life support before withdrawing care, referred to as donation after cardiac death donors.

The first patient to receive a donated heart preserved via the new technology at Atrium Health had their transplant completed recently and is currently recovering in the hospital.

"This was a patient who was potentially looking at a long wait for an organ transplant," said Skipper. "But because of the ability to utilize this technology, they were able to receive a heart very quickly."

Sanger Heart & Vascular Institute is the only transplant center in the greater Charlotte region currently using this technology and was identified as an ideal location because it is a high-quality and high-volume transplant center. The transplant team utilized Atrium Health's MedCenter Air to transport the team to and from the donor location.

The U.S. Food and Drug Administration approved the use of this device in April 2022 to preserve hearts for donation after cardiac death. The approval followed results from a multi-center clinical trial comparing the use of the technology to the traditional cold storage method of preserving donated hearts during transport. The study found that using the OCS resulted in 90 patients (of the 180 randomized and transplanted patients) receiving organs that were previously unable to be used prior to this technology. Those recipients had a one-year survival rate of 93.3% compared to an 87.3% one-year survival rate among a control group where OCS was not used.

"We were always limited to accepting organs from donors who suffered immediate brain death," said Dr. Joseph Mishkin, an advanced heart failure transplant cardiologist at Sanger Heart & Vascular Institute. "We now can accept organs from donors who have suffered an irreversible brain injury but do not meet formal brain death criteria. In these instances, the family has decided to withdraw care. The donor's organs can now be a life-saving gift for others."

Across the U.S., more than 3,300 people are on the waiting list for a heart transplant and 95 of those are waiting in North Carolina, according to the U.S. Department of Health & Human Services Organ Procurement and Transplantation Network.

"We face a nationwide shortage of donated organs. I expect this technology to transform the transplant industry, increasing the national donor supply and helping us transplant more patients in need," said Mishkin.

### About Atrium Health

Atrium Health is a nationally recognized leader in shaping health outcomes through innovative research, education and compassionate patient care. Based in Charlotte, North Carolina, Atrium Health is an integrated, nonprofit health system with more than 70,000 teammates serving patients at 40 hospitals and more than 1,400 care locations. It provides care under the Atrium Health Wake Forest Baptist name in the Winston-Salem, North Carolina, region, as well as Atrium Health Navicent and Atrium Health Floyd in Georgia and Alabama. Atrium Health is renowned for its top-ranked pediatric, cancer and heart care, as well as organ transplants, burn treatments and specialized musculoskeletal programs. A recognized leader in experiential medical education and groundbreaking research, Wake Forest University School of Medicine is the academic core of the enterprise, including Wake Forest Innovations, which is advancing new medical technologies and biomedical discoveries. Atrium Health is also a leading-edge innovator in virtual care and mobile medicine, providing care close to home and in the home. Ranked nationally among U.S. News & World Report's Best Hospitals in eight pediatric specialties and for rehabilitation, Atrium Health has also received the American Hospital Association's Quest for Quality Prize and its 2021 Carolyn Boone Lewis Equity of Care Award, as well as the 2020 Centers for Medicare & Medicaid Services Health Equity Award for its efforts to reduce racial and ethnic disparities in care. With a commitment to every community it serves, Atrium Health seeks to improve health, elevate hope and advance healing – for all, providing \$2.46 billion last year in free and uncompensated care and other community benefits.





**Driscoll**  
Children's Hospital

## ***NEW Opportunity*** **Chief of Pediatric Cardiac Intensive Care**

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

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

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

### **About Driscoll Children's Hospital**

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

### **About Corpus Christi, Texas**

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

### **Apply Today!**

**[Lori.smith@dchstx.org](mailto:Lori.smith@dchstx.org)**

*Director of Physician Recruitment*

361.694.5906 – direct line



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**PICS Istanbul 2023**

Istanbul, Turkey

<https://www.picsistanbul.com/>

**16-18**

**The 7<sup>th</sup> Annual Advances in Congenital Heart Disease Summit: Transposition of the Great Arteries: The Master Class**

Orlando, FL, USA

<https://www.clevelandclinicmeded.com/live/courses/CongenitalHeart23/>

**25-28**

**CRT23 – Cardiovascular Research Technologies**

Washington, DC, USA

<https://www.crtmeeting.org/Default.aspx>

## 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/>

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Published Mid-August

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