

Division Details

Division Data Summary

Research and Training Details

Number of Faculty	35
Number of Joint Appointment Faculty	2
Number of Research Fellows	6
Number of Support Personnel	137
Direct Annual Grant Support	\$1,184,765
Direct Annual Industry Support	\$59,351
Peer Reviewed Publications	121

Clinical Activities and Training

Number of Clinical Staff	2
Number of Clinical Fellows	13
Inpatient Encounters	1,281
Outpatient Encounters	15,699

Division Photo

No Photo information has been entered yet.

Significant Publications

Kindel SJ, Miller EM, Gupta R, Cripe LH, Hinton RB, Spicer RL, **Towbin JA**, Ware SM. **Pediatric cardiomyopathy: importance of genetic and metabolic evaluation.** *Journal of cardiac failure*. 18(5):396-403. May 2012.

Cardiomyopathies are primary heart muscle disorders characterized by abnormalities in the size, thickness and function of the heart muscle. In childhood, these are typically caused by genetic and metabolic abnormalities. In this study, we determined that 76% of probands had familial, syndromic, or metabolic causes. In 43% of hypertrophic cardiomyopathy (HCM) patients, mutations in sarcomeric genes (predominantly MYH7 and MYBPC3 mutations) was noted while 17% had metabolic causes. Dilated cardiomyopathy (DCM) patients had similar rates of syndromic (20%) and metabolic (16%) causes, but fewer familial cases (24%) compared with HCM patients.

Krawczeski CD, Goldstein SL, Woo JG, Wang Y, Piyaphanee N, Ma Q, Bennett M, Devarajan P. **Temporal relationship and predictive value of urinary acute kidney injury biomarkers after pediatric cardiopulmonary bypass.** *J Am Coll Cardiol*. 58(22):2301-9. Nov 2011.

This study, on a large group of pediatric cardiac surgical patients, demonstrates the temporal rise and relationship of four early urinary biomarkers for acute kidney injury (AKI) following cardiopulmonary bypass. Importantly, it is the first study to demonstrate that the use of biomarker combinations are more predictive of AKI than a single biomarker alone. The addition a urinary biomarker “panel”, consisting of the combination of NGAL, IL-18, L-FABP, and KIM-1, to a clinical model, enhanced the prediction of AKI in the first 6-24 hours after surgery. The use of biomarker combinations may enhance early prediction and timing of AKI, allowing for

targeted therapy designed at lessening disease severity.

Kwiatkowski D, Wang Y, **Cnota J**. **The utility of outpatient echocardiography for evaluation of asymptomatic murmurs in children.** *Congenit Heart Dis*. 7(3):283-8. May 2012.

Echocardiography is often used to assess heart murmurs in asymptomatic children, but the utility of such testing has not been studied in a contemporary era of routine prenatal ultrasound, telemedicine, pulse oximetry screening, and expanded neonatal echocardiography. We reviewed the results of 462 sedated outpatient echocardiograms performed in asymptomatic children between 1 month and 4 years of age, categorizing cardiac findings as none/mild in 91%, moderate in 8%, and severe in 1%. No severe pathology was seen in children over 1 year of age. These results may assist clinical decision-making and inform efforts to control health-care costs in children.

Purevjav E, Arimura T, Augustin S, Huby AC, Takagi K, Nunoda S, Kearney DL, **Taylor MD**, Terasaki F, Bos JM, Ommen SR, Shibata H, Takahashi M, Itoh-Satoh M, McKenna WJ, Murphy RT, Labeit S, Yamanaka Y, Machida N, Park JE, Alexander PM, Weintraub RG, Kitaura Y, Ackerman MJ, Kimura A, **Towbin JA**. **Molecular basis for clinical heterogeneity in inherited cardiomyopathies due to myopalladin mutations.** *Hum Mol Genet*. 21(9):2039-53. May 2012.

Most childhood forms of cardiomyopathy have a genetic basis. The sarcomere and Z-disc are commonly affected areas of the myocardium in these disorders. We were able to show that mutations in myopalladin (MYPN), a Z-disc protein expressed in striated muscle that functions as a structural, signaling and gene expression-regulating molecule in response to muscle stress, caused a substantial number of cases of DCM, HCM and RCM, depending on the position of the mutation. This data shows that the clinical appearance of cardiomyopathies may differ widely, even when caused by mutations in the same gene.

Urbina EM, Gao Z, Khoury PR, Martin LJ, Dolan LM. **Insulin resistance and arterial stiffness in healthy adolescents and young adults.** *Diabetologia*. 55(3):625-31. Mar 2012.

Cardiovascular (CV) diseases are the leading cause of death throughout the world. Increased arterial stiffness is an early marker for CV disease risk as stiffer vessels predict heart attack and stroke in obese adults with insulin resistance (IR). Whether obese youth with IR have stiffer vessels is not known. Therefore, we measured CV risk factors and arterial stiffness in 343 non-diabetic adolescents and young adults 15-28 years of age. We found that obese subjects with IR had stiffer vessels than those without IR demonstrating lower brachial artery distensibility, higher pulse wave velocity and augmentation index. However, this difference was accounted for by adverse levels of CV risk factors such as obesity, BP and cholesterol and not insulin resistance per se. We concluded that obesity and elevated BP are the major factors driving increased CV risk in non-diabetic youth. Efforts to combat the obesity epidemic should be top priority to reduce future CV risk in America's young adults.

Division Publications

1. Acharya A, Hans CP, Koenig SN, Nichols HA, Galindo CL, Garner HR, Merrill WH, Hinton RB, Garg V. **Inhibitory role of Notch1 in calcific aortic valve disease.** *PloS one*. 2011; 6:e27743.
2. Ackerman MJ, Priori SG, Willems S, Berul C, Brugada R, Calkins H, Camm AJ, Ellinor PT, Gollob M, Hamilton R, Hershberger RE, Judge DP, Le Marec H, McKenna WJ, Schulze-Bahr E, Semsarian C, Towbin JA, Watkins H, Wilde A, Wolpert C, Zipes DP. **HRS/EHRA expert consensus statement on the state of genetic testing for the channelopathies and cardiomyopathies this document was developed as a partnership between the Heart Rhythm Society (HRS) and the European Heart Rhythm Association (EHRA).** *Heart rhythm : the official journal of the Heart Rhythm Society*. 2011; 8:1308-39.
3. Ackerman MJ, Priori SG, Willems S, Berul C, Brugada R, Calkins H, Camm AJ, Ellinor PT, Gollob M, Hamilton

R, Hershberger RE, Judge DP, Le Marec H, McKenna WJ, Schulze-Bahr E, Semsarian C, Towbin JA, Watkins H, Wilde A, Wolpert C, Zipes DP. **HRS/EHRA expert consensus statement on the state of genetic testing for the channelopathies and cardiomyopathies: this document was developed as a partnership between the Heart Rhythm Society (HRS) and the European Heart Rhythm Association (EHRA).** *Europace : European pacing, arrhythmias, and cardiac electrophysiology : journal of the working groups on cardiac pacing, arrhythmias, and cardiac cellular electrophysiology of the European Society of Cardiology.* 2011; 13:1077-109.

4. Alvarez JA, Orav EJ, Wilkinson JD, Fleming LE, Lee DJ, Sleeper LA, Rusconi PG, Colan SD, Hsu DT, Canter CE, Webber SA, Cox GF, Jefferies JL, Towbin JA, Lipshultz SE. **Competing risks for death and cardiac transplantation in children with dilated cardiomyopathy: results from the pediatric cardiomyopathy registry.** *Circulation.* 2011; 124:814-23.
5. Anderson JB, Iyer SB, Beekman RH, 3rd, Jenkins KJ, Klitzner TS, Kugler JD, Martin GR, Neish SR, Rosenthal GL, Lannon CM. **National pediatric cardiology quality improvement collaborative: Lessons from development and early years.** *Progress in Pediatric Cardiology.* 2011; 32:103-109.
6. Anderson JB, Knilans TK. **Syncope.** *Schwartz's Clinical Handbook of Pediatrics.* Baltimore: Lippincott Williams & Wilkins; 2012:793-798.
7. Anderson JB, Marino BS, Irving SY, Garcia-Espana JF, Ravishankar C, Stallings VA, Medoff-Cooper B. **Poor post-operative growth in infants with two-ventricle physiology.** *Cardiology in the young.* 2011; 21:421-9.
8. Bainbridge MN, Wang M, Wu Y, Newsham I, Muzny DM, Jefferies JL, Albert TJ, Burgess DL, Gibbs RA. **Targeted enrichment beyond the consensus coding DNA sequence exome reveals exons with higher variant densities.** *Genome biology.* 2011; 12:R68.
9. Barsheshet A, Goldenberg I, J OU, Moss AJ, Jons C, Shimizu W, Wilde AA, McNitt S, Peterson DR, Zareba W, Robinson JL, Ackerman MJ, Cypress M, Gray DA, Hofman N, Kanter JK, Kaufman ES, Platonov PG, Qi M, Towbin JA, Vincent GM, Lopes CM. **Mutations in cytoplasmic loops of the KCNQ1 channel and the risk of life-threatening events: implications for mutation-specific response to beta-blocker therapy in type 1 long-QT syndrome.** *Circulation.* 2012; 125:1988-96.
10. Barsheshet A, Moss AJ, McNitt S, Polonsky S, Lopes CM, Zareba W, Robinson JL, Ackerman MJ, Benhorin J, Kaufman ES, Towbin JA, Vincent GM, Qi M, Goldenberg I. **Risk of syncope in family members who are genotype-negative for a family-associated long-QT syndrome mutation.** *Circulation. Cardiovascular genetics.* 2011; 4:491-9.
11. Barsheshet A, Peterson DR, Moss AJ, Schwartz PJ, Kaufman ES, McNitt S, Polonsky S, Buber J, Zareba W, Robinson JL, Ackerman MJ, Benhorin J, Towbin JA, Vincent GM, Zhang L, Goldenberg I. **Genotype-specific QT correction for heart rate and the risk of life-threatening cardiac events in adolescents with congenital long-QT syndrome.** *Heart rhythm : the official journal of the Heart Rhythm Society.* 2011; 8:1207-13.
12. Bassett AS, McDonald-McGinn DM, Devriendt K, Digilio MC, Goldenberg P, Habel A, Marino B, Oskarsdottir S, Philip N, Sullivan K, Swillen A, Vorstman J. **Practical guidelines for managing patients with 22q11.2 deletion syndrome.** *The Journal of pediatrics.* 2011; 159:332-9 e1.
13. Beebe DW, Miller N, Kirk S, Daniels SR, Amin R. **The association between obstructive sleep apnea and dietary choices among obese individuals during middle to late childhood.** *Sleep medicine.* 2011; 12:797-9.
14. Bennett BL, Mahabee-Gittens M, Chua MS, Hirsch R. **Elevated cardiac troponin I level in cases of thoracic nonaccidental trauma.** *Pediatric emergency care.* 2011; 27:941-4.
15. Bergersen L, Gauvreau K, Foerster SR, Marshall AC, McElhinney DB, Beekman RH, 3rd, Hirsch R, Kreutzer J, Balzer D, Vincent J, Hellenbrand WE, Holzer R, Cheatham JP, Moore JW, Burch G, Armsby L, Lock JE, Jenkins KJ. **Catheterization for Congenital Heart Disease Adjustment for Risk Method (CHARM).** *JACC.*

Cardiovascular interventions. 2011; 4:1037-46.

16. Blinder JJ, Goldstein SL, Lee VV, Baycroft A, Fraser CD, Nelson D, Jefferies JL. **Congenital heart surgery in infants: effects of acute kidney injury on outcomes**. *J Thorac Cardiovasc Surg*. 2012; 143:368-74.
17. Blinder JJ, Martinez HR, Craigen WJ, Belmont J, Pignatelli RH, Jefferies JL. **Noncompaction of the left ventricular myocardium in a boy with a novel chromosome 8p23.1 deletion**. *American journal of medical genetics. Part A*. 2011; 155A:2215-20.
18. Carlo WF, Carberry KE, Heinle JS, Morales DL, McKenzie ED, Fraser CD, Jr., Nelson DP. **Interstage attrition between bidirectional Glenn and Fontan palliation in children with hypoplastic left heart syndrome**. *The Journal of thoracic and cardiovascular surgery*. 2011; 142:511-6.
19. Casadonte JR, Kim JM, Dadlani GH, Jacobs JP, Cooper DS, Stapleton GE. **Blalock-Taussig Shunt Thrombosis Prophylaxis in a Patient With Jacobsen Syndrome and Thrombocytopenia**. *World Journal for Pediatric and Congenital Heart Surgery*. 2011; 2:641-643.
20. Chai PJ, Jacobs JP, Dalton HJ, Costello JM, Cooper DS, Kirsch R, Rosenthal T, Graziano JN, Quintessenza JA. **Extracorporeal cardiopulmonary resuscitation for post-operative cardiac arrest: indications, techniques, controversies, and early results--what is known (and unknown)**. *Cardiol Young*. 2011; 21 Suppl 2:109-17.
21. Cnota JF, Gupta R, Michelfelder EC, Ittenbach RF. **Congenital heart disease infant death rates decrease as gestational age advances from 34 to 40 weeks**. *The Journal of pediatrics*. 2011; 159:761-5.
22. Cooper DS, Charpie JR, Flores FX, Gaynor JW, Salvin JW, Devarajan P, Krawczeski CD. **Acute Kidney Injury and Critical Cardiac Disease**. *World Journal for Pediatric and Congenital Heart Surgery*. 2011; 2:411-423.
23. Costa J, Lopes CM, Barsheshet A, Moss AJ, Migdalovich D, Ouellet G, McNitt S, Polonsky S, Robinson JL, Zareba W, Ackerman MJ, Benhorin J, Kaufman ES, Platonov PG, Shimizu W, Towbin JA, Vincent GM, Wilde AA, Goldenberg I. **Combined assessment of sex- and mutation-specific information for risk stratification in type 1 long QT syndrome**. *Heart Rhythm*. 2012; 9:892-8.
24. Costello JM, Cooper DS, Jacobs JP, Chai PJ, Kirsch R, Rosenthal T, Dalton HJ, Graziano JN, Quintessenza JA. **Intermediate-term outcomes after paediatric cardiac extracorporeal membrane oxygenation--what is known (and unknown)**. *Cardiol Young*. 2011; 21 Suppl 2:118-23.
25. Czosek RJ, Goldenberg P, Miller EM, Spicer R, Towbin JA, Ware SM. **Cardiac electrical system involvement in Alstrom syndrome: uncommon causes of dilated cardiomyopathies**. *Cardiogenetics*. 2012; 2:e2.
26. Czosek RJ, Knilans TK. **Tachycardia**. *Schwartz's Clinical Handbook of Pediatrics*. Baltimore: Lippincott Williams & Wilkins; 2012:799-808.
27. Czosek RJ, Meganathan K, Anderson JB, Knilans TK, Marino BS, Heaton PC. **Cardiac rhythm devices in the pediatric population: utilization and complications**. *Heart rhythm : the official journal of the Heart Rhythm Society*. 2012; 9:199-208.
28. Divanovic A, Cnota J, Ittenbach R, Tan X, Border W, Crombleholme T, Michelfelder E. **Characterization of diastolic dysfunction in twin-twin transfusion syndrome: association between Doppler findings and ventricular hypertrophy**. *Journal of the American Society of Echocardiography : official publication of the American Society of Echocardiography*. 2011; 24:834-40.
29. Edwards NM, Daniels SR, Claytor RP, Khoury PR, Dolan LM, Kimball TR, Urbina EM. **Physical activity is independently associated with multiple measures of arterial stiffness in adolescents and young adults**. *Metabolism*. 2012; 61:869-72.
30. Feinstein JA, Benson DW, Dubin AM, Cohen MS, Maxey DM, Mahle WT, Pahl E, Villafane J, Bhatt AB, Peng LF, Johnson BA, Marsden AL, Daniels CJ, Rudd NA, Caldarone CA, Mussatto KA, Morales DL, Ivy DD, Gaynor

- JW, Tweddell JS, Deal BJ, Furck AK, Rosenthal GL, Ohye RG, Ghanayem NS, Cheatham JP, Tworetzky W, Martin GR. **Hypoplastic left heart syndrome: current considerations and expectations.** *J Am Coll Cardiol.* 2012; 59:S1-42.
31. Flynn JT, Urbina EM. **Pediatric ambulatory blood pressure monitoring: indications and interpretations.** *J Clin Hypertens (Greenwich).* 2012; 14:372-82.
 32. Frommelt PC, Guey LT, Minich LL, Bhat M, Bradley TJ, Colan SD, Ensing G, Gorentz J, Heydarian H, John JB, Lai WW, Levine JC, Mahle WT, Miller SG, Ohye RG, Pearson GD, Shirali GS, Wong PC, Cohen MS. **Does Initial Shunt Type for the Norwood Procedure Affect Echocardiographic Measures of Cardiac Size and Function During Infancy?: The Single Ventricle Reconstruction Trial.** *Circulation.* 2012; 125:2630-2638.
 33. Gazit AZ, Cooper DS. **Emerging technologies.** *Pediatric critical care medicine : a journal of the Society of Critical Care Medicine and the World Federation of Pediatric Intensive and Critical Care Societies.* 2011; 12:S55-61.
 34. Gersh BJ, Maron BJ, Bonow RO, Dearani JA, Fifer MA, Link MS, Naidu SS, Nishimura RA, Ommen SR, Rakowski H, Seidman CE, Towbin JA, Udelson JE, Yancy CW. **2011 ACCF/AHA guideline for the diagnosis and treatment of hypertrophic cardiomyopathy: a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines.** *The Journal of thoracic and cardiovascular surgery.* 2011; 142:e153-203.
 35. Gersh BJ, Maron BJ, Bonow RO, Dearani JA, Fifer MA, Link MS, Naidu SS, Nishimura RA, Ommen SR, Rakowski H, Seidman CE, Towbin JA, Udelson JE, Yancy CW. **2011 ACCF/AHA guideline for the diagnosis and treatment of hypertrophic cardiomyopathy: executive summary: a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines.** *The Journal of thoracic and cardiovascular surgery.* 2011; 142:1303-38.
 36. Gersh BJ, Maron BJ, Bonow RO, Dearani JA, Fifer MA, Link MS, Naidu SS, Nishimura RA, Ommen SR, Rakowski H, Seidman CE, Towbin JA, Udelson JE, Yancy CW. **2011 ACCF/AHA Guideline for the Diagnosis and Treatment of Hypertrophic Cardiomyopathy A Report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines Developed in Collaboration With the American Association for Thoracic Surgery, American Society of Echocardiography, American Society of Nuclear Cardiology, Heart Failure Society of America, Heart Rhythm Society, Society for Cardiovascular Angiography and Interventions, and Society of Thoracic Surgeons.** *Journal of the American College of Cardiology.* 2011; 58:e212-60.
 37. Gersh BJ, Maron BJ, Bonow RO, Dearani JA, Fifer MA, Link MS, Naidu SS, Nishimura RA, Ommen SR, Rakowski H, Seidman CE, Towbin JA, Udelson JE, Yancy CW. **2011 ACCF/AHA Guideline for the Diagnosis and Treatment of Hypertrophic Cardiomyopathy: A Report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines.** *Circulation.* 2011; 124:e783-831.
 38. Gersh BJ, Maron BJ, Bonow RO, Dearani JA, Fifer MA, Link MS, Naidu SS, Nishimura RA, Ommen SR, Rakowski H, Seidman CE, Towbin JA, Udelson JE, Yancy CW. **2011 ACCF/AHA Guideline for the Diagnosis and Treatment of Hypertrophic Cardiomyopathy: Executive Summary A Report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines Developed in Collaboration With the American Association for Thoracic Surgery, American Society of Echocardiography, American Society of Nuclear Cardiology, Heart Failure Society of America, Heart Rhythm Society, Society for Cardiovascular Angiography and Interventions, and Society of Thoracic Surgeons.** *Journal of the American College of Cardiology.* 2011; 58:2703-38.
 39. Gersh BJ, Maron BJ, Bonow RO, Dearani JA, Fifer MA, Link MS, Naidu SS, Nishimura RA, Ommen SR, Rakowski H, Seidman CE, Towbin JA, Udelson JE, Yancy CW. **2011 ACCF/AHA Guideline for the Diagnosis and Treatment of Hypertrophic Cardiomyopathy: Executive Summary: A Report of the American**

40. Goldberg DJ, French B, Szwast AL, McBride MG, Marino BS, Mirarchi N, Hanna BD, Wernovsky G, Paridon SM, Rychik J. **Impact of sildenafil on echocardiographic indices of myocardial performance after the fontan operation.** *Pediatr Cardiol*. 2012; 33:689-96.
41. Goldenberg I, Thottathil P, Lopes CM, Moss AJ, McNitt S, J OU, Robinson JL, Zareba W, Ackerman MJ, Kaufman ES, Towbin JA, Vincent M, Barsheshet A. **Trigger-specific ion-channel mechanisms, risk factors, and response to therapy in type 1 long QT syndrome.** *Heart rhythm : the official journal of the Heart Rhythm Society*. 2012; 9:49-56.
42. Goldenberg PC, Calkins ME, Richard J, McDonald-McGinn D, Zackai E, Mitra N, Emanuel B, Devoto M, Borgmann-Winter K, Kohler C, Conroy CG, Gur RC, Gur RE. **Computerized neurocognitive profile in young people with 22q11.2 deletion syndrome compared to youths with schizophrenia and At-Risk for psychosis.** *American journal of medical genetics. Part B, Neuropsychiatric genetics : the official publication of the International Society of Psychiatric Genetics*. 2012; 159B:87-93.
43. Goldstein BH, Aiyagari R, Bocks ML, Armstrong AK. **Hydrogel expandable coils for vascular occlusion in congenital cardiovascular disease: a single center experience.** *Congenit Heart Dis*. 2012; 7:212-8.
44. Goldstein BH, Fifer CG, Armstrong AK, Gelehrter SK, Treadwell MC, van de Ven C, Rocchini AP. **Use of a pressure guidewire in fetal cardiac intervention for critical aortic stenosis.** *Pediatrics*. 2011; 128:e716-9.
45. Goldstein BH, Golbus JR, Sandelin AM, Warnke N, Gooding L, King KK, Donohue JE, Gurney JG, Goldberg CS, Rocchini AP, Charpie JR. **Usefulness of peripheral vascular function to predict functional health status in patients with Fontan circulation.** *The American journal of cardiology*. 2011; 108:428-34.
46. Goldstein BH, Sandelin AM, Golbus JR, Warnke N, Gooding L, King KK, Donohue JE, Yu S, Gurney JG, Goldberg CS, Rocchini AP, Charpie JR. **Impact of vitamin C on endothelial function and exercise capacity in patients with a fontan circulation.** *Congenit Heart Dis*. 2012; 7:226-34.
47. Habli M, Michelfelder E, Cnota J, Wall D, Polzin W, Lewis D, Lim FY, Crombleholme TM. **Prevalence and progression of recipient-twin cardiomyopathy in early-stage twin-twin transfusion syndrome.** *Ultrasound in obstetrics & gynecology : the official journal of the International Society of Ultrasound in Obstetrics and Gynecology*. 2012; 39:63-8.
48. Hehir DA, Cooper DS, Walters EM, Ghanayem NS. **Feeding, growth, nutrition, and optimal interstage surveillance for infants with hypoplastic left heart syndrome.** *Cardiol Young*. 2011; 21 Suppl 2:59-64.
49. Hickey EJ, Veldtman G, Bradley TJ, Gengsakul A, Webb G, Williams WG, Manlhiot C, McCrindle BW. **Functional health status in adult survivors of operative repair of tetralogy of fallot.** *The American journal of cardiology*. 2012; 109:873-80.
50. Hinton RB, Benson DW. **Hypoplastic Left Heart Syndrome.** *Pediatric cardiovascular medicine*. Chichester, West Sussex, UK: Wiley-Blackwell; 2012:523-533.
51. Hollander SA, Reinhartz O, Chin C, Yeh J, Maeda K, Mallidi H, Bernstein D, Rosenthal D. **Use of the Impella 5.0 as a bridge from ECMO to implantation of the HeartMate II left ventricular assist device in a pediatric patient.** *Pediatric transplantation*. 2012; 16:205-6.
52. Hom KA, Hirsch R, Elluru RG. **Antihypertensive drug-induced angioedema causing upper airway obstruction in children.** *International journal of pediatric otorhinolaryngology*. 2012; 76:14-9.
53. Hor KH, Marino B. **Chest Pain.** *Schwartz's Clinical Handbook of Pediatrics*. Baltimore: Lippincott Williams & Wilkins; 2012:209-216.
54. Hor KN, Mazur W, Taylor MD, Al-Khalidi HR, Cripe LH, Jefferies JL, Raman SV, Chung ES, Kinnett KJ, Williams K, Gottliebson WM, Benson DW. **Effects of steroids and angiotensin converting enzyme inhibition on circumferential strain in boys with Duchenne muscular dystrophy: a cross-sectional and**

- longitudinal study utilizing cardiovascular magnetic resonance.** *Journal of cardiovascular magnetic resonance : official journal of the Society for Cardiovascular Magnetic Resonance.* 2011; 13:60.
55. Hunt SA, Burch MB, Bhat G, Canter CE, Chinnock RE, Crespo-Leiro M, Delgado RM, Dobbels F, Grady KL, Kao WG, Lamour JM, Parry G, Patel JK, Pini D, Towbin JA, Wolfel EE. **Long-term Care of Heart Transplant Recipients.** *ISHLT Guidelines for the Care of Heart Transplant Recipients.* Birmingham: University of Alabama Printing; 2012.
 56. Iyer SB, Anderson JB, Slicker J, Beekman RH, 3rd, Lannon CM. **Using Statistical Process Control to Identify Early Growth Failure Among Infants With Hypoplastic Left Heart Syndrome.** *World Journal for Pediatric and Congenital Heart Surgery.* 2011; 2:576-585.
 57. Jacobs JP, Pasquali SK, Jeffries H, Barnett-Jones S, Cooper DS, Vincent R. **Outcomes Analysis and Quality Improvement for the Treatment of Patients With Pediatric and Congenital Cardiac Disease.** *World Journal for Pediatric and Congenital Heart Surgery.* 2011; 2:620-633.
 58. James J, Kinnett K, Wang Y, Ittenbach RF, Benson DW, Cripe L. **Electrocardiographic abnormalities in very young Duchenne muscular dystrophy patients precede the onset of cardiac dysfunction.** *Neuromuscular disorders : NMD.* 2011; 21:462-7.
 59. Jefferies JL, Pignatelli RH, Martinez HR, Robbins-Furman PJ, Liu P, Gu W, Lupski JR, Potocki L. **Cardiovascular findings in duplication 17p11.2 syndrome.** *Genetics in medicine : official journal of the American College of Medical Genetics.* 2012; 14:90-4.
 60. Johnson BA, Marino B. **Cyanosis.** *Schwartz's Clinical Handbook of Pediatrics.* Baltimore: Lippincott Williams & Wilkins; 2012:266-273.
 61. Kanetzke EE, Lynch J, Prows CA, Siegel RM, Myers MF. **Perceived utility of parent-generated family health history as a health promotion tool in pediatric practice.** *Clinical pediatrics.* 2011; 50:720-8.
 62. Kindel SJ, Miller EM, Gupta R, Cripe LH, Hinton RB, Spicer RL, Towbin JA, Ware SM. **Pediatric cardiomyopathy: importance of genetic and metabolic evaluation.** *J Card Fail.* 2012; 18:396-403.
 63. Krawczeski CD, Goldstein SL, Woo JG, Wang Y, Piyaphanee N, Ma Q, Bennett M, Devarajan P. **Temporal relationship and predictive value of urinary acute kidney injury biomarkers after pediatric cardiopulmonary bypass.** *Journal of the American College of Cardiology.* 2011; 58:2301-9.
 64. Krishnamurthy VK, Opoka AM, Kern CB, Guilak F, Narmoneva DA, Hinton RB. **Maladaptive matrix remodeling and regional biomechanical dysfunction in a mouse model of aortic valve disease.** *Matrix biology : journal of the International Society for Matrix Biology.* 2012; 31:197-205.
 65. Kwiatkowski D, Wang Y, Cnota J. **The utility of outpatient echocardiography for evaluation of asymptomatic murmurs in children.** *Congenit Heart Dis.* 2012; 7:283-8.
 66. Kwiatkowski DM, Goldstein SL, Krawczeski CD. **Biomarkers of acute kidney injury in pediatric cardiac patients.** *Biomark Med.* 2012; 6:273-82.
 67. Laksman ZW, Silversides CK, Sedlak T, Samman AM, Williams WG, Webb GD, Liu PP. **Valvular aortic stenosis as a major sequelae in patients with pre-existing subaortic stenosis changing spectrum of outcomes.** *Journal of the American College of Cardiology.* 2011; 58:962-5.
 68. Larsen RL, Canter CE, Naftel DC, Tressler M, Rosenthal DN, Blume ED, Mahle WT, Yung D, Morrow WR, Orav EJ, Wilkinson JD, Towbin JA, Lipshultz SE. **The impact of heart failure severity at time of listing for cardiac transplantation on survival in pediatric cardiomyopathy.** *The Journal of heart and lung transplantation : the official publication of the International Society for Heart Transplantation.* 2011; 30:755-60.
 69. Lorts A. **Pleural Effusions.** *Schwartz's Clinical Handbook of Pediatrics.* Baltimore: Lippincott Williams & Wilkins; 2012:633-638.
 70. Lorts A, Krawczeski CD. **Perioperative care of a child with transposition of the great arteries.** *Current treatment options in cardiovascular medicine.* 2011; 13:456-63.
 71. Mack EH, Wheeler DS, Hirsch R. **Endovascular treatment of near-fatal neonatal superior vena cava**

- syndrome.** *Pediatric critical care medicine : a journal of the Society of Critical Care Medicine and the World Federation of Pediatric Intensive and Critical Care Societies.* 2011; 12:e410-2.
72. Mahle WT, Martin GR, Beekman RH, 3rd, Morrow WR. **Endorsement of Health and Human Services recommendation for pulse oximetry screening for critical congenital heart disease.** *Pediatrics.* 2012; 129:190-2.
73. Marino BS. **Transposition of the Great Arteries.** *The 5 Minute Pediatric Consult.* Philadelphia: Lippincott Williams & Wilkins; 2012:898-899.
74. Marino BS, Jefferies JL. **Myocarditis.** *The 5 Minute Pediatric Consult.* Philadelphia: Lippincott Williams & Wilkins; 2012:568-569.
75. Martin GR, Mitchell S, Beekman RH, 3rd, Feinstein JA, Jenkins KJ, Landzberg M, Webb G. **The Adult Congenital and Pediatric Cardiology Section: increasing the opportunities for the congenital heart disease community within the American College of Cardiology.** *Journal of the American College of Cardiology.* 2012; 59:84-7.
76. Martin LJ, Hinton RB, Benson DW. **Genetics of Cardiovascular Disease in the Young.** *Pediatric cardiovascular medicine.* Chichester, West Sussex, UK: Wiley-Blackwell; 2012:23-32.
77. Martin LJ, Hinton RB, Zhang X, Cripe LH, Benson DW. **Aorta Measurements are Heritable and Influenced by Bicuspid Aortic Valve.** *Front Genet.* 2011; 2:61.
78. Martinez HR, Niu MC, Sutton VR, Pignatelli R, Vatta M, Jefferies JL. **Coffin-Lowry syndrome and left ventricular noncompaction cardiomyopathy with a restrictive pattern.** *American journal of medical genetics. Part A.* 2011; 155A:3030-4.
79. Martinez HR, Pignatelli R, Belmont JW, Craigen WJ, Jefferies JL. **Childhood onset of left ventricular dysfunction in a female manifesting carrier of muscular dystrophy.** *American journal of medical genetics. Part A.* 2011; 155A:3025-9.
80. Maskatia SA, Decker JA, Spinner JA, Kim JJ, Price JF, Jefferies JL, Dreyer WJ, Smith EO, Rossano JW, Denfield SW. **Restrictive Physiology is Associated With Poor Outcomes in Children With Hypertrophic Cardiomyopathy.** *Pediatric cardiology.* 2012; 33:141-9.
81. Mazur W, Hor KN, Germann JT, Fleck RJ, Al-Khalidi HR, Wansapura JP, Chung ES, Taylor MD, Jefferies JL, Woodrow Benson D, Gottliebson WM. **Patterns of left ventricular remodeling in patients with Duchenne Muscular Dystrophy: a cardiac MRI study of ventricular geometry, global function, and strain.** *Int J Cardiovasc Imaging.* 2012; 28:99-107.
82. Metzger A, Matsuura T, McKnite S, Marino BS, Nadkarni VM, Yannopoulos D. **Intrathoracic pressure regulation improves 24-hour survival in a pediatric porcine model of hemorrhagic shock.** *Pediatric research.* 2011; 70:267-71.
83. Migdalovich D, Moss AJ, Lopes CM, Costa J, Ouellet G, Barsheshet A, McNitt S, Polonsky S, Robinson JL, Zareba W, Ackerman MJ, Benhorin J, Kaufman ES, Platonov PG, Shimizu W, Towbin JA, Vincent GM, Wilde AA, Goldenberg I. **Mutation and gender-specific risk in type 2 long QT syndrome: implications for risk stratification for life-threatening cardiac events in patients with long QT syndrome.** *Heart rhythm : the official journal of the Heart Rhythm Society.* 2011; 8:1537-43.
84. Moffett BS, McDade E, Rossano JW, Dickerson HA, Nelson DP. **Enteral potassium supplementation in a pediatric cardiac intensive care unit: evaluation of a practice change.** *Pediatric critical care medicine : a journal of the Society of Critical Care Medicine and the World Federation of Pediatric Intensive and Critical Care Societies.* 2011; 12:552-4.
85. Murphy LL, Moon-Grady AJ, Cuneo BF, Wakai RT, Yu S, Kunic JD, Benson DW, George AL, Jr.. **Developmentally regulated SCN5A splice variant potentiates dysfunction of a novel mutation associated with severe fetal arrhythmia.** *Heart Rhythm.* 2012; 9:590-7.

86. Nehus E, Goebel J, Mitsnefes M, Lorts A, Laskin B. **Intensive hemodialysis for cardiomyopathy associated with end-stage renal disease.** *Pediatric nephrology*. 2011; 26:1909-12.
87. Newburger JW, Sleeper LA, Bellinger DC, Goldberg CS, Tabbutt S, Lu M, Mussatto KA, Williams IA, Gustafson KE, Mital S, Pike N, Sood E, Mahle WT, Cooper DS, Dunbar-Masterson C, Krawczeski CD, Lewis A, Menon SC, Pemberton VL, Ravishankar C, Atz TW, Ohye RG, Gaynor JW. **Early developmental outcome in children with hypoplastic left heart syndrome and related anomalies: the single ventricle reconstruction trial.** *Circulation*. 2012; 125:2081-91.
88. Opatowsky AR, Siddiqi OK, D'Souza B, Webb GD, Fernandes SM, Landzberg MJ. **Maternal cardiovascular events during childbirth among women with congenital heart disease.** *Heart*. 2012; 98:145-51.
89. Pahl E, Sleeper LA, Canter CE, Hsu DT, Lu M, Webber SA, Colan SD, Kantor PF, Everitt MD, Towbin JA, Jefferies JL, Kaufman BD, Wilkinson JD, Lipshultz SE. **Incidence of and risk factors for sudden cardiac death in children with dilated cardiomyopathy: a report from the Pediatric Cardiomyopathy Registry.** *Journal of the American College of Cardiology*. 2012; 59:607-15.
90. Parikh CR, Coca SG, Thiessen-Philbrook H, Shlipak MG, Koyner JL, Wang Z, Edelstein CL, Devarajan P, Patel UD, Zappitelli M, Krawczeski CD, Passik CS, Swaminathan M, Garg AX. **Postoperative biomarkers predict acute kidney injury and poor outcomes after adult cardiac surgery.** *J Am Soc Nephrol*. 2011; 22:1748-57.
91. Parikh CR, Devarajan P, Zappitelli M, Sint K, Thiessen-Philbrook H, Li S, Kim RW, Koyner JL, Coca SG, Edelstein CL, Shlipak MG, Garg AX, Krawczeski CD. **Postoperative biomarkers predict acute kidney injury and poor outcomes after pediatric cardiac surgery.** *Journal of the American Society of Nephrology : JASN*. 2011; 22:1737-47.
92. Perry J, Lanzberg M, Franklin W, Webb GD, Chang AC. **Cardiac Intensive Care of the Adult With Congenital Heart Disease: Basic Principles in the Management of Common Problems.** *World Journal for Pediatric and Congenital Heart Surgery*. 2011; :3.
93. Pignatelli R, Law MA, Martinez H, Altman C, Ayres N, Jefferies JL, Ganame J. **Two-dimensional speckle strain imaging: in the management of paraganglioma, acute junctional tachycardia, and myocardial dysfunction in a child.** *Texas Heart Institute journal / from the Texas Heart Institute of St. Luke's Episcopal Hospital, Texas Children's Hospital*. 2012; 39:119-21.
94. Purejav E, Arimura T, Augustin S, Huby AC, Takagi K, Nunoda S, Kearney DL, Taylor MD, Terasaki F, Bos JM, Ommen SR, Shibata H, Takahashi M, Itoh-Satoh M, McKenna WJ, Murphy RT, Labeit S, Yamanaka Y, Machida N, Park JE, Alexander PM, Weintraub RG, Kitaura Y, Ackerman MJ, Kimura A, Towbin JA. **Molecular basis for clinical heterogeneity in inherited cardiomyopathies due to myopalladin mutations.** *Human molecular genetics*. 2012; 21:2039-53.
95. Rocchini AP, Goldstein BH. **Common Arterial Trunk (Truncus Arteriosus).** *Pediatric cardiovascular medicine*. Chichester, West Sussex, UK: Wiley-Blackwell; 2012:651-659.
96. Rossano JW, Kim JJ, Decker JA, Price JF, Zafar F, Graves DE, Morales DL, Heinle JS, Bozkurt B, Towbin JA, Denfield SW, Dreyer WJ, Jefferies JL. **Prevalence, morbidity, and mortality of heart failure-related hospitalizations in children in the United States: a population-based study.** *J Card Fail*. 2012; 18:459-70.
97. Schumacher KR, Cools M, Goldstein BH, Ioffe-Dahan V, King K, Gaffney D, Russell MW. **Oral budesonide treatment for protein-losing enteropathy in Fontan-palliated patients.** *Pediatric cardiology*. 2011; 32:966-71.
98. Shah AS, Dolan LM, D'Agostino RB, Jr., Standiford D, Davis C, Testaverde L, Pihoker C, Daniels SR, Urbina EM. **Comparison of mercury and aneroid blood pressure measurements in youth.** *Pediatrics*. 2012; 129:e1205-10.
99. Shah AS, Dolan LM, Gao Z, Kimball TR, Urbina EM. **Racial differences in arterial stiffness among adolescents and young adults with type 2 diabetes.** *Pediatric diabetes*. 2012; 13:170-5.

100. Shamszad P, Slesnick TC, Smith EO, Taylor MD, Feig DI. **Association between left ventricular mass index and cardiac function in pediatric dialysis patients.** *Pediatr Nephrol.* 2012; 27:835-41.
101. Shen J, Benson DW. **Aortopulmonary Shunts: Patent Ductus Arteriosus, Aortopulmonary Window, Aortic Origin of a Pulmonary Artery.** *Pediatric cardiovascular medicine.* Chichester, West Sussex, UK: Wiley-Blackwell; 2012:343-353.
102. Sheridan RM, Michelfelder EC, Choe KA, Divanovic A, Liu C, Ware S, Stanek J. **Ductus arteriosus aneurysm with massive thrombosis of pulmonary artery and fetal hydrops.** *Pediatric and developmental pathology : the official journal of the Society for Pediatric Pathology and the Paediatric Pathology Society.* 2012; 15:79-85.
103. Siegel RM, Rich W, Khoury J. **An office-based low-carbohydrate intervention in teens: one-year follow-up of a six-month intervention.** *Clinical pediatrics.* 2011; 50:1062-3.
104. Srivatsa SS, Taylor MD, Hor K, Collins DA, King-Strunk M, Pelberg RA, Mazur W. **Liquefaction necrosis of mitral annular calcification (LNMAC): review of pathology, prevalence, imaging and management: proposed diagnostic imaging criteria with detailed multi-modality and MRI image characterization.** *Int J Cardiovasc Imaging.* 2012; 28:1161-71.
105. Sung V, Beebe DW, Vandyke R, Fenchel MC, Crimmins NA, Kirk S, Hiscock H, Amin R, Wake M. **Does sleep duration predict metabolic risk in obese adolescents attending tertiary services? A cross-sectional study.** *Sleep.* 2011; 34:891-8.
106. Thiagarajan RR, Almond CS, Cooper DS, Morales DLS. **Ventricular Assist Devices for Mechanical Circulatory Support in Children.** *World Journal for Pediatric and Congenital Heart Surgery.* 2012; 3:104-109.
107. Tisma-Dupanovic S, Gowdamarajan R, Goldenberg I, Huang DT, Knilans T, Towbin JA. **Prolonged QT in a 13-year-old patient with Down syndrome and complete atrioventricular canal defect.** *Annals of noninvasive electrocardiology : the official journal of the International Society for Holter and Noninvasive Electrocardiology, Inc.* 2011; 16:403-6.
108. Towbin JA. **Cardiomyopathies.** *Pediatric cardiovascular medicine.* Chichester, West Sussex, UK: Wiley-Blackwell; 2012:826-854.
109. Towbin JA, Vatta M, Li H, Bowles NE. **Genetics and Cardiac Arrhythmia Syndromes.** *Electrophysiological Disorders of the Heart.* Philadelphia: Elsevier Saunders; 2011:795-808.
110. Tuzun E, Bick R, Kadipasaoglu C, Conger JL, Poindexter BJ, Gregoric ID, Frazier OH, Towbin JA, Radovancevic B. **Modification of a volume-overload heart failure model to track myocardial remodeling and device-related reverse remodeling.** *ISRN cardiology.* 2011; 2011:831062.
111. Urbina EM, Gao Z, Khoury PR, Martin LJ, Dolan LM. **Insulin resistance and arterial stiffness in healthy adolescents and young adults.** *Diabetologia.* 2012; 55:625-31.
112. Varma N, Helms R, Benson DW, Sanagala T. **Congenital sick sinus syndrome with atrial inexcitability and coronary sinus flutter.** *Circulation. Arrhythmia and electrophysiology.* 2011; 4:e52-8.
113. Walsh MA, Grenier MA, Jefferies JL, Towbin JA, Lorts A, Czosek RJ. **Conduction abnormalities in pediatric patients with restrictive cardiomyopathy.** *Circulation. Heart failure.* 2012; 5:267-73.
114. Williams RV, Zak V, Ravishankar C, Altmann K, Anderson J, Atz AM, Dunbar-Masterson C, Ghanayem N, Lambert L, Lurito K, Medoff-Cooper B, Margossian R, Pemberton VL, Russell J, Stylianou M, Hsu D. **Factors affecting growth in infants with single ventricle physiology: a report from the Pediatric Heart Network Infant Single Ventricle Trial.** *J Pediatr.* 2011; 159:1017-22 e2.
115. Woodward GA, Kirsch R, Trautman MS, Kleinman ME, Wernovsky G, Marino BS. **Stabilization and Transport of the High-Risk Infant.** *Avery's Diseases of the Newborn: Expert Consult.* Philadelphia: Saunders Elsevier; 2011:341-356.
116. Wray J, Brown K, Marino BS, Franklin R. **Medical Test Results Do Not Tell the Whole Story: Health-Related Quality of Life Offers a Patient Perspective on Outcomes.** *World Journal for Pediatric and*

- Congenital Heart Surgery*. 2011; 2:566-575.
117. Wray J, Franklin R, Brown K, Blyth J, Marino BS. **Linguistic validation of a disease-specific quality of life measure for children and teenagers with cardiac disease**. *Cardiol Young*. 2012; 22:13-7.
118. Yetman AT, Webb GD. **Adults with Congenital Heart Disease**. *Pediatric cardiovascular medicine*. Chichester, West Sussex, UK: Wiley-Blackwell; 2012:762-772.
119. Zaoutis TE, Webber S, Naftel DC, Chrisant MA, Kaufman B, Pearce FB, Spicer R, Dipchand AI. **Invasive fungal infections in pediatric heart transplant recipients: incidence, risk factors, and outcomes**. *Pediatric transplantation*. 2011; 15:465-9.
120. Zappitelli M, Krawczeski CD, Devarajan P, Wang Z, Sint K, Thiessen-Philbrook H, Li S, Bennett MR, Ma Q, Shlipak MG, Garg AX, Parikh CR. **Early postoperative serum cystatin C predicts severe acute kidney injury following pediatric cardiac surgery**. *Kidney international*. 2011; 80:655-62.
121. Zussman ME, Bagby M, Benson DW, Gupta R, Hirsch R. **Pulmonary vascular resistance in repaired congenital diaphragmatic hernia vs. age-matched controls**. *Pediatr Res*. 2012; 71:697-700.

Faculty, Staff, and Trainees

Faculty Members

Jeffrey A. Towbin, MD, FAAP, FACC, FAHA, Professor

Leadership Executive Co-Director, The Heart Institute; Director and Chief, Division of Cardiology

Research Interests Cardiomyopathy and Genetics

Jeffrey B. Anderson, MD, MPH, Assistant Professor

Leadership Director, Value Delivery

Research Interests Syncope, Nutritional failure in congenital heart disease, Quality improvement

Robert Beekman, MD, Professor

Research Interests Cardiac Catheterization & Intervention, Quality Improvement, Coarctation of the Aorta

D. Woodrow Benson, MD, PhD, Professor

Leadership Director, Cardiovascular Genetics

Research Interests Cardiovascular Genetics

Clifford Chin, MD, Professor

Leadership Medical Director, Pediatric Heart Transplant Service

Research Interests Cardiomyopathy, Heart Failure, and Cardiac Transplantation

James F. Cnota, MD, Associate Professor

Leadership Director, Neonatal Cardiology

Research Interests Fetal Cardiology, Multicenter clinical trials

David S. Cooper, MD, MPH, Assistant Professor

Leadership Associate Medical Director, Cardiac Intensive Care Unit; Director, Cardiac ECMO Program

Research Interests Acute Kidney Injury in Critical Cardiac Disease, Anticoagulation on Extracorporeal Support, Outcomes research

Linda H. Cripe, MD, Associate Professor

Research Interests Cardiomyopathies, Neuromuscular Disorders, Echocardiography

Richard Czosek, MD, Assistant Professor

Research Interests Cardiac pacing devices in pediatric and congenital heart disease patients and arrhythmia risk stratification in the pediatric population

Allison Divanovic, MD, Assistant Professor

Research Interests Fetal Echocardiography

Paula Goldenberg, MD, MSCE, MSW, FAAP, FACMG, Associate Professor

Research Interests Cardiovascular Genetics

Bryan H. Goldstein, MD, Assistant Professor

Research Interests Cardiac catheterization & intervention, Hybrid therapies for congenital heart disease, Single ventricle outcomes

Michelle Grenier, MD, Associate Professor

Leadership Director, 3 Dimensional Echocardiography

Research Interests Cardiomyopathy, Heart Failure, 3 Dimensional Echocardiography, Athletic Screening in Sudden Cardiac Death

Haleh Heydarian, MD, Assistant Professor

Research Interests Echocardiography Synchrony/Strain Imaging and Quality Improvement

Robert B. Hinton, MD, Assistant Professor

Leadership Director, Heart Institute BioRepository

Research Interests Cardiovascular Genetics & Developmental Biology

Russel Hirsch, MD, Associate Professor

Leadership Director, Pulmonary Hypertension Service

Research Interests Cardiac Catheterization & Intervention, Device Development

Kan Hor, MD, Assistant Professor

Research Interests MRI technology to diagnose and follow heart disease, in particular DMD cardiomyopathy

Holly M. Ippisch, MD, MS, FAAP, Assistant Professor

Research Interests Echocardiography, preventive cardiology, exercise and pediatric obesity

John Lynn Jefferies, MD, MPH, FACC, FAAP, Associate Professor

Leadership Director, Cardiomyopathy/Heart Failure & Transplantation; Co-Director, CV Genetics

Research Interests Cardiomyopathy, Heart Failure, Cardiovascular Genetics and drug trials

Thomas R. Kimball, MD, Professor

Leadership Medical Director, Heart Institute

Research Interests Echocardiography, Ventricular function, Cardiovascular Effects of Obesity and Type II Diabetes

Shelley Kirk, PhD, RD, LD, Assistant Professor

Research Interests The efficacy, safety and feasibility of interventions for the management of pediatric obesity

Timothy Knilans, MD, Professor

Leadership Director, Clinical Cardiac Electrophysiology and Pacing; Director, Pediatric Cardiac Electrophysiology Fellowship

Research Interests Identification and risk stratification of causes of sudden death

Catherine Krawczeski, MD, Associate Professor

Leadership Director, Heart Institute Quality Improvement and Clinical Effectiveness; Co-Director, Center for

Acute Care Nephrology

Research Interests Cardiac surgery-associated acute kidney injury, cardiorenal syndromes, biomarkers, quality improvement

Cong Liu, PhD, Assistant Professor

Leadership Associate Director of HIDL

Research Interests Genetic etiology of cardiomyopathy, congenital heart disease and cardiovascular diseases. New technology development in clinical genetic testing and clinical viral testing

Angela Lorts, MD, Assistant Professor

Research Interests Heart failure and myocardial remodeling

Bradley S. Marino, MD, MPP, MSCE, Associate Professor

Leadership Director, Heart Institute Research Core; Director, Heart Institute Neurodevelopmental Clinic

Research Interests Outcomes Research

Erik Michelfelder, MD, Associate Professor

Leadership Co-Director, Cardiac Imaging; Director, Fetal Heart Program

Research Interests Fetal Cardiology and Echocardiography

David Nelson, MD, PhD, Professor

Leadership Medical Director, CICU

Research Interests Inflammatory injury after cardiac surgery

Enkhsaikhan Purevjav, MD, PhD, Assistant Professor

Research Interests Genetics of Cardiovascular Disease

Robert Siegel, MD, Professor

Leadership Medical Director, The Center for Better Health and Nutrition

Robert Spicer, MD, Professor

Research Interests Heart Failure Transplant

Arnold Strauss, MD, Professor

Leadership BK Rachford Professor and Chair, Department of Pediatrics, University of Cincinnati College of Medicine; Director, Cincinnati Children's Research Foundation; Chief Medical Officer, Cincinnati Children's Hospital Medical Center

Michael Taylor, MD, PhD, Assistant Professor

Leadership Director of Advanced Imaging Innovation and Cardiac MRI (CMR)

Research Interests Non-invasive study of cardiovascular physiology and metabolism; Pre-clinical imaging of cardiomyopathy models with cardiac MR and positron emission tomography

Elaine Urbina, MD, MS, Associate Professor

Leadership Director, Preventive Cardiology

Research Interests Non-invasive assessment of vascular structure and function and relationship to CV risk factors, obesity, diabetes, renal disease and sleep disorders. Treatment of high blood pressure and cholesterol

Gary Webb, MD, FRCP(C), FACC, FAHA, Professor

Leadership Director, Adolescent and Adult Congenital Heart Disease Program

Research Interests Adolescent and Adult Congenital Heart Disease

Joint Appointment Faculty Members

Jeanne James, MD, Associate Professor (Molecular Cardiovascular Biology)

Research Interests Manifestations and etiologies of misfolded protein response and echocardiography

Stephanie Ware, MD, Associate Professor (Molecular Cardiovascular Biology)

Research Interests Cardiovascular Genetics

Clinical Staff Members

- **Lisa Lee, MD**
- **Chad Connor, MD**

Trainees

- **Christopher Cheng, MD, PhD**, PL5, New York Methodist
- **David Kwiatkowski, MD**, PL4, Cincinnati Children's Hospital/University of Cincinnati
- **Benjamin Landis, MD**, PL4, Columbia University
- **Sam Hanke, MD**, PL6, Cincinnati Children's Hospital/University of Cincinnati
- **Chike Madueme, MD**, PL7, Cincinnati Children's Hospital/University of Cincinnati
- **Ryan Moore, MD**, PL4, Cincinnati Children's Hospital/University of Cincinnati
- **Thomas Ryan, MD, PhD**, PL6, Cincinnati Children's Hospital/University of Cincinnati
- **Christopher Statile, MD**, PL6, Cincinnati Children's Hospital/University of Cincinnati
- **Aashoo Tandon, MD**, PL4, Cincinnati Children's Hospital/University of Cincinnati
- **Tamara Thomas, MD**, PL5, Vanderbilt University
- **Chet Villa, MD**, PL5, Cincinnati Children's Hospital/University of Cincinnati
- **Dingding Xiong, MD, PhD**, PL6, Driscoll Children's Hospital
- **Matt Zussman, MD**, PL7, University of North Carolina, Chapel Hill
- **Anne-Cecile Huby, PhD**, UPMC, Pierre and Marie Curie University, France
- **Sarkies Ruben Mattheus, Martherus, PhD**, Maastricht University, The Netherlands
- **Charu Munjal, PhD**, University of Louisville
- **Kathryn M. Rafferty, PhD**, Cincinnati Children's Hospital/University of Cincinnati
- **Ken Takagi, MD**, Baylor College of Medicine
- **Varun Krishnamurthy, BS**, PL5, University of Cincinnati

Division Collaboration

Neurology; Developmental and Behavioral Pediatrics; Nutrition Therapy; Cancer and Blood Diseases

Institute; Social Services » Mark Shapiro, MD, Kris Wesselkamper, MD, Shannon Standridge, MPH, DO, Cameron Thomas, MD, Julia Anixt, MD, Karen Mason, MD, Jannel Phillips, PhD, Patricia Eiler-Sims, PsyD, Stacey Morrison, PsyD, Jodi Raugh, MPT, Karen Harpster, PhD, OTR/L, Kristy Keyes, RD, Megan Horsley, RD, Mary Kay Irwin, MEd, EdD, Patricia Towbin, MEd, Sarah Strong, Jamie Brauley, MSW, LISW, and Lisa Dodd

The Neurodevelopmental Clinic offers specialized neurodevelopmental care to children and adolescents with a history of heart disease. The clinic's multi-disciplinary team provides a comprehensive neurodevelopmental evaluation for infants, toddlers, children and adolescents by providing families with the appropriate surveillance, screening, evaluation and treatment resources needed to ensure the best outcome possible for the patients.

Biostatistics & Epidemiology » Jessica Woo, MHSA, PhD, Eileen King, PhD, Yu Wang, MS, MAS, Phil Khoury, MS, Zhiqian Gao, Jesse Pratt, MS, MA, and Patricia Herbers, MS

The Heart Institute Research Core (HIRC) supports innovative, clinical, and translational science by facilitating

the design of research processes, implementation of research plans, dissemination and application of findings, and development of research professionals. The collaboration between the Heart Institute and the Division of Biostatistics & Epidemiology promotes efficiency of resource utilization by providing specialized statistical support for HIRC's research projects.

Nephrology & Hypertension » Stuart Goldstein, MD and Prasad Devarajan, MD

Collaborative research and clinical care of kidney injury in critical cardiac disease. In one study, we are performing vascular function in children with CKD on dialysis to see if it correlates with coronary calcification and if it differs by type of dialysis used.

Nephrology » David Hooper, MD

Performing cardiac and carotid ultrasound and arterial stiffness in children after kidney transplant.

Nephrology » Mark Mitsnefes, MD

Chronic Kidney Disease in Children study, performing and reading carotid and cardiac ultrasound in children with kidney disease.

Hematology; Pharmacology » Joseph Palumbo, MD, Cristina Tarango, MD, and Alexander Vinks, PharmD, PhD, FCP

Studying recombinant antithrombin III supplementation in patients on extracorporeal support (cardiopulmonary bypass and extracorporeal membrane oxygenation).

Endocrinology » Lawrence Dolan, MD

Search for Diabetes in Youth study, performing vascular function testing on youth with type 1 and type 2 diabetes.

Exercise Physiology » Nicholas Edwards, MD, MPH

BMI rebound study, analyzing previously collected vascular function data in youth to compare to activity data.

Sports Medicine » Nicholas Edwards, MD, MPH

A feasibility study compares the practicality and effects of high intensity interval training to standard aerobic exercise in obese teens.

Perinatal Institute » Foong-Yen Lim, MD, William Polzin, MD, and Mounira Habli, MD

Assessing fetal cardiac abnormalities in twin-twin transfusion syndrome, fetal mass lesions, and tumors. Research on novel delivery strategies in critical fetal heart disease.

Anesthesiology » Pornswan Ngamprasertwong, MD and Senthilkumar Sadhasivam, MD, MPH

Assessing fetal cardiac function in an ovine model of maternal-fetal anesthesia.

Sickle Cell » Punam Malik, MD

Research studying the cardiovascular effects of sickle cell, specifically the correlates of pulmonary hypertension and diastolic dysfunction.

Pediatric Surgery; Biostatistics & Epidemiology » Thomas Inge, MD, PhD and Jessica Woo, MHSA, PhD

A project comparing the long-term outcome of severely obese adolescents undergoing bariatric surgery to those participating in a comprehensive medical weight management program.

Biostatistics & Epidemiology; Adolescent Medicine » Eileen King, PhD and Maria Britto, MD, MPH

This project tests the feasibility of using wireless/continuous feedback devices in augmenting weight management in obese teens. This project has led to an R21 application, submitted to NIH in June 2012.

Behavioral Medicine & Clinical Psychology » Megan Ratcliff, PhD, MPH

A pilot study that looks at the effects of blueberry supplemental drink on weight management, vascular function and cognitive function in obese teens.

The Anderson Center for Health Systems Excellence » Linda Dynan, PhD

A study that looks at rapid cycle, serial changes in setup, design and messaging on effects on cafeteria purchases by evaluating food consumption over time.

Fetal Care Center » Mounira Habli, MD

Studying the postnatal effects on left ventricular mass and function in a mouse model of intrauterine growth retardation.

Neurology; Pulmonary Medicine » Brenda Wong, MBBS, MRCP, Jim Collins, MD, PhD, and Hemant Sawnani, MD

Neuromuscular Clinic

Neurology; Pulmonary Medicine; Cancer and Blood Diseases Institute; Genetics » Jim Collins, MD, PhD, Hemant Sawnani, MD, and Rajaram Nagarajan, MD, MS

Cardiomyopathy Clinic

Endocrinology; Genetics »

Cardiovascular Genetics Clinic

Grants, Contracts, and Industry Agreements

Grant and Contract Awards	Annual Direct
---------------------------	---------------

ANDERSON, J**Nutritional Deficiencies in Infants with Single Ventricle**

Thrasher Research Fund

10/01/10-09/30/12

\$12,500

CNOTA, J / KRAWCZESKI, C**Pediatric Heart Network Prairieland Consortium**

National Institutes of Health

U01 HL 109673

09/01/11-06/30/16

\$367,500

COOPER, D**Outcomes in Patients Requiring More Than a Single Course of ECMO Therapy**

Extracorporeal Life Support Organization

04/01/12-03/31/13

\$5,000

HOR, K**Early Treatment with Aldosterone Antagonism Attenuates Cardiomyopathy in Duchenne Muscular Dystrophy**

Parent Project Muscular Dystrophy

06/01/12-05/31/14

\$29,811

Early Treatment with Aldosterone Antagonism Attenuates Cardiomyopathy in Duchenne Muscular Dystrophy - Supplement Funds

Ohio State University

06/01/12-05/31/14

\$10,000

IPPISCH, H**Cardiovascular Effects of Dietary Fat and Exercise Challenges in Obese Children**

National Institutes of Health

K23 HL 091174

09/01/08-07/31/13

\$126,135

KIMBALL, T**Chronic Kidney Disease in Children**

National Institutes of Health(Children's Mercy Hospital)		
U01 DK 066143	08/01/08-07/31/13	\$55,222
LATTIN, B		
Weight Management Program for Pre-school Children: A Feasibility Study for Group Treatment		
Aramark(Academy of Nutrition and Dietetics)		
	06/01/12-05/31/13	\$10,000
MARINO, B		
Do Biochemical, Hematopoietic, and Stool Biomarkers Predict Low Cardiac Index in Patients with Fontan Physiology		
Children's Heart Foundation		
	01/01/12-12/31/13	\$100,000
Understanding Mechanisms of Fontan Failure and Key Predictors for Patient Outcome		
National Institutes of Health(Georgia Tech Research Corp)		
R01 HL 098252	02/01/10-01/31/14	\$16,667
MICHELFELDER, E		
Hypoplastic Left Heart Syndrome: Expression of RHD in the Fetus?		
National Institutes of Health(Washington University)		
	05/15/11-12/31/14	\$33,848
URBINA, E		
Accelerated CV Aging in Youth Related to CV Risk Factor Clusters		
National Institutes of Health		
R01 HL 105591	01/01/11-12/31/15	\$379,410
Modifying Dietary Behavior in Adolescents with Elevated Blood Pressure		
National Institutes of Health(University of Cincinnati)		
R01 HL 088567	02/01/08-01/31/13	\$38,672
Current Year Direct		\$1,184,765
Industry Contracts		
BEEKMAN, R		
JHU		
		\$2,229
CHIN, C		
Hoffman-LaRoche, Inc		
		\$10,372
HIRSCH, R		
AGA Medical, LLC		
		\$22,372
KRAWCZESKI, C		
Asklepiion Pharmaceuticals, LLC		
		\$24,378
Current Year Direct Receipts		\$59,351
Total		\$1,244,116