

# 2013 Research Annual Report

## Cardiology



### Division Details

#### Division Data Summary

##### **RESEARCH AND TRAINING DETAILS**

Number of Faculty	<b>44</b>
Number of Joint Appointment Faculty	<b>2</b>
Number of Research Fellows	<b>4</b>
Number of Support Personnel	<b>156</b>
Direct Annual Grant Support	<b>\$1,135,130</b>
Direct Annual Industry Support	<b>\$32,236</b>
Peer Reviewed Publications	<b>121</b>

##### **CLINICAL ACTIVITIES AND TRAINING**

Number of Clinical Staff	<b>2</b>
Number of Clinical Fellows	<b>14</b>
Inpatient Encounters	<b>1,469</b>
Outpatient Encounters	<b>16,765</b>

#### Division Photo

No Photo information has been entered yet.

### Significant Publications

Brescia ST, Rossano JW, Pignatelli R, **Jefferies JL**, Price JF, Decker JA, Denfield SW, Dreyer WJ, Smith O, **Towbin JA**, Kim JJ. **Mortality and sudden death in pediatric left ventricular noncompaction in a tertiary referral center**. *Circulation*. 2013 Jun 4;127(22):2202-8.

This article is the largest report ever published on left ventricular noncompaction (LVNC) in children. The frequency of this diagnosis is increasing the importance of defining risk factors for morbidity and mortality. Our publication delineates specific clinical criteria that are predictive of poor outcome. These criteria offer clinicians around the world guidance for management of children with LVNC. Furthermore, this study fills a void in the existing literature regarding this disease and will contribute to the substrate for cardiomyopathy guidelines in the future.

### Division Publications

1. Alghamdi M, De Souza AM, White CT, Potts MT, Warady BA, Furth SL, Kimball TR, Potts JE, Sandor GG. **Echo-Doppler assessment of the biophysical properties of the aorta in children with chronic kidney disease**. *Pediatr Cardiol*. 2013; 34:1218-25.
2. Allen KY, Goldstein BH, Pahl E, Schumacher KR, Gajarski RJ, Backer CL, Wax DF, Kaushal S, Gossett JG. **Non-cameral coronary artery fistulae after pediatric cardiac transplantation: a multicenter study**. *J Heart Lung Transplant*. 2012; 31:744-9.
3. Anderson JB, Czosek RJ, Cnota J, Meganathan K, Knilans TK, Heaton PC. **Pediatric syncope: national hospital ambulatory medical care survey results**. *J Emerg Med*. 2012; 43:575-83.
4. Anderson JB, Czosek RJ, Knilans TK, Marino BS. **The effect of paediatric syncope on health-related**

**quality of life.** *Cardiol Young.* 2012; 22:583-8.

5. Anderson JB, Czosek RJ, Knilans TK, Meganathan K, Heaton P. **Postoperative Heart Block in Children with Common Forms of Congenital Heart Disease: Results from the KID Database.** *J Cardiovasc Electrophysiol.* 2012; 23:1349-54.
6. Anderson JB, Iyer SB, Schidlow DN, Williams R, Varadarajan K, Horsley M, Slicker J, Pratt J, King E, Lannon C. **Variation in growth of infants with a single ventricle.** *J Pediatr.* 2012; 161:16-21 e1; quiz 21 e2-3.
7. Ashley EA, Hershberger RE, Caleshu C, Ellinor PT, Garcia JG, Herrington DM, Ho CY, Johnson JA, Kittner SJ, Macrae CA, Mudd-Martin G, Rader DJ, Roden DM, Scholes D, Sellke FW, Towbin JA, Van Eyk J, Worrall BB. **Genetics and cardiovascular disease: a policy statement from the American Heart Association.** *Circulation.* 2012; 126:142-57.
8. Askenazi DJ, Selewski DT, Paden ML, Cooper DS, Bridges BC, Zappitelli M, Fleming GM. **Renal replacement therapy in critically ill patients receiving extracorporeal membrane oxygenation.** *Clin J Am Soc Nephrol.* 2012; 7:1328-36.
9. Averin K, Uzark K, Beekman RH, 3rd, Willging JP, Pratt J, Manning PB. **Postoperative assessment of laryngopharyngeal dysfunction in neonates after Norwood operation.** *Ann Thorac Surg.* 2012; 94:1257-61.
10. Bartos DC, Anderson JB, Bastiaenen R, Johnson JN, Gollob MH, Tester DJ, Burgess DE, Homfray T, Behr ER, Ackerman MJ, Guicheney P, Delisle BP. **A KCNQ1 mutation causes a high penetrance for familial atrial fibrillation.** *J Cardiovasc Electrophysiol.* 2013; 24:562-9.
11. Beekman RH, 3rd. **Coarctation of the Aorta.** In: HD Allen, DJ Driscoll, RE Shaddy, TF Feltes, eds. *Moss & Adams' Heart Disease in Infants, Children and Adolescents: Including the Fetus and Young Adult.* Philadelphia, PA: Lippincott Williams & Wilkins; 2012:1044-1060.
12. Beekman RH, 3rd. **FDA Clearance of Cardiac Devices for Children: A Primer and Call to Action.** *Congenital Cardiology Today.* 2012; 10:1-7.
13. Beekman RH, 3rd, Lannon C. **The National Pediatric Cardiology Quality Improvement Collaborative.** *Neonatology Today.* 2013; 8:1-5.
14. Berger KA, Lynch J, Prows CA, Siegel RM, Myers MF. **Mothers' perceptions of family health history and an online, parent-generated family health history tool.** *Clin Pediatr (Phila).* 2013; 52:74-81.
15. Brescia ST, Rossano JW, Pignatelli R, Jefferies JL, Price JF, Decker JA, Denfield SW, Dreyer WJ, Smith O, Towbin JA, Kim JJ. **Mortality and sudden death in pediatric left ventricular noncompaction in a tertiary referral center.** *Circulation.* 2013; 127:2202-8.
16. Bridges BC, Selewski DT, Paden ML, Cooper DS, Zappitelli M, Fleming GM, Askenazi DJ. **Acute Kidney Injury in Neonates Requiring ECMO.** *NeoReviews.* 2012; 13:e428-433.
17. Brown KL, Ichord R, Marino BS, Thiagarajan RR. **Outcomes Following Extracorporeal Membrane Oxygenation in Children with Cardiac Disease.** *Pediatric Critical Care Medicine.* 2013; 15:S73-S83.
18. Burns KC, Nagarajan R, O. SF, Marino BS. **Oncology.** In: BS Marino, KS Fine, eds. *Blueprints: Pediatrics.* Philadelphia, PA: Lippincott Williams & Wilkins; 2013:205-223.
19. Cassedy A, Drotar D, Ittenbach R, Hottinger S, Wray J, Wernovsky G, Newburger JW, Mahony L, Mussatto K, Cohen MI, Marino BS. **The impact of socio-economic status on health related quality of life for children and adolescents with heart disease.** *Health Qual Life Outcomes.* 2013; 11:99.
20. Chen H, Zhang W, Sun X, Yoshimoto M, Chen Z, Zhu W, Liu J, Shen Y, Yong W, Li D, Zhang J, Lin Y, Li B, Vandusen NJ, Snider P, Schwartz RJ, Conway SJ, Field LJ, Yoder MC, Firulli AB, Carlesso N, Towbin JA, Shou W. **Fkbp1a controls ventricular myocardium trabeculation and compaction by regulating endocardial Notch1 activity.** *Development.* 2013; 140:1946-57.

21. Chin C. **Cardiac antibody-mediated rejection.** *Pediatr Transplant.* 2012; 16:404-12.
22. Cnota JF, Allen KR, Colan S, Covitz W, Graham EM, Hehir DA, Levine JC, Margossian R, McCrindle BW, Minich LL, Natarajan S, Richmond ME, Hsu DT, Pediatric Heart Network I. **Superior cavopulmonary anastomosis timing and outcomes in infants with single ventricle.** *J Thorac Cardiovasc Surg.* 2013; 145:1288-96.
23. Cohen M, Ladinsky M, Marino BS. **Gastroenterology.** In: BS Marino, KS Fine, eds. *Blueprints: Pediatrics.* Philadelphia, PA: Lippincott Williams & Wilkins; 2013:134-153.
24. Cooper DS, Hirsch JC, Jacobs JJ. **Pediatric Cardiac Extracorporeal Life Support.** In: GM Annich, WR Lynch, G MacLaren, JM Wilson, RH Bartlett, eds. *ECMO: Extracorporeal Cardiopulmonary Support in Critical Care.* Ann Arbor: Extracorporeal Life Support Organization; 2012.
25. Cooper DS, Prêtre R. **Clinical management of pediatric ventricular assist devices.** *Pediatr Crit Care Med.* 2013; 14:S27-36.
26. Cooper DS, Thiagarajan RR, Almond CS, VanderPluym CJ, Buchholz H, Jacobs JP. **Ventricular Assist Devices in Children.** In: GM Annich, WR Lynch, G MacLaren, JM Wilson, RH Bartlett, eds. *ECMO: Extracorporeal Cardiopulmonary Support in Critical Care.* Ann Arbor: Extracorporeal Life Support Organization; 2012.
27. Czosek RJ, Anderson J, Khouri PR, Knilans TK, Spar DS, Marino BS. **Utility of ambulatory monitoring in patients with congenital heart disease.** *Am J Cardiol.* 2013; 111:723-30.
28. Czosek RJ, Anderson JB, Heaton PC, Cassedy A, Schnell B, Cnota JF. **Staged palliation of hypoplastic left heart syndrome: trends in mortality, cost, and length of stay using a national database from 2000 through 2009.** *Am J Cardiol.* 2013; 111:1792-9.
29. Czosek RJ, Bonney WJ, Cassedy A, Mah DY, Tanel RE, Imundo JR, Singh AK, Cohen MI, Miyake CY, Fawley K, Marino BS. **Impact of cardiac devices on the quality of life in pediatric patients.** *Circ Arrhythm Electrophysiol.* 2012; 5:1064-72.
30. Divanović A, Witte D, Michelfelder E. **A fetus with hypoplastic left heart syndrome and tricuspid stenosis with evolving hydrops fetalis.** *Pediatr Cardiol.* 2012; 33:1210-2.
31. Elder D, Marino BS. **Endocrinology.** In: BS Marino, KS Fine, eds. *Blueprints: Pediatrics.* Philadelphia, PA: Lippincott Williams & Wilkins; 2013:241-455.
32. Fleming GM, Askenazi DJ, Bridges BC, Cooper DS, Paden ML, Selewski DT, Zappitelli M. **A multicenter international survey of renal supportive therapy during ECMO: the Kidney Intervention During Extracorporeal Membrane Oxygenation (KIDMO) group.** *ASAIO J.* 2012; 58:407-14.
33. Frank LH, Bradshaw E, Beekman R, Mahle WT, Martin GR. **Critical congenital heart disease screening using pulse oximetry.** *J Pediatr.* 2013; 162:445-53.
34. Frommelt PC, Gerstenberger E, Baffa J, Border WL, Bradley TJ, Colan S, Gorentz J, Heydarian H, John JB, Lai WW, Levine J, Lu JC, McCandless RT, Miller S, Nutting A, Ohye RG, Pearson GD, Wong PC, Cohen MS, Pediatric Heart Network I. **Doppler flow patterns in the right ventricle-to-pulmonary artery shunt and neo-aorta in infants with single right ventricle anomalies: impact on outcome after initial staged palliations.** *J Am Soc Echocardiogr.* 2013; 26:521-9.
35. George-Abraham JK, Zimmerman SL, Hinton RB, Marino BS, Witte DP, Hopkin RJ. **Tetrasomy 15q25.2 >qter identified with SNP microarray in a patient with multiple anomalies including complex cardiovascular malformation.** *Am J Med Genet A.* 2012; 158A:1971-6.
36. Ghanayem NS, Allen KR, Tabbutt S, Atz AM, Clabby ML, Cooper DS, Eghtesady P, Frommelt PC, Gruber PJ, Hill KD, Kaltman JR, Laussen PC, Lewis AB, Lurito KJ, Minich LL, Ohye RG, Schonbeck JV, Schwartz SM, Singh RK, Goldberg CS. **Interstage mortality after the Norwood procedure: Results of the multicenter Single Ventricle Reconstruction trial.** *J Thorac Cardiovasc Surg.* 2012; 144:896-906.

37. Goldenberg P, Marino BS. **Genetic Disorders**. In: BS Marino, KS Fine, eds. *Blueprints: Pediatrics*. Philadelphia, PA: Lippincott Williams & Wilkins; 2013:315-326.
38. Goldstein BH, Hirsch R, Zussman ME, Vincent JA, Torres AJ, Coulson J, Ringel RE, Beekman RH, 3rd. **Percutaneous balloon-expandable covered stent implantation for treatment of traumatic aortic injury in children and adolescents**. *Am J Cardiol*. 2012; 110:1541-5.
39. Grenier MA. **Looking into an athlete's heart: Panacea or Pandora's box?** *Future Cardiol*. 2012; 8:805-7.
40. Griffin AC, Strauss AW, Bennett MJ, Ernst LM. **Mutations in long-chain 3-hydroxyacyl coenzyme a dehydrogenase are associated with placental maternal floor infarction/massive perivillous fibrin deposition**. *Pediatr Dev Pathol*. 2012; 15:368-74.
41. Guha IN, Bokhandi S, Ahmad Z, Sheron N, Cope R, Marshall C, Veldtman G. **Structural and functional uncoupling of liver performance in the Fontan circulation**. *Int J Cardiol*. 2013; 164:77-81.
42. Gupta R, Marino BS, Cnota JF, Ittenbach RF. **Finding the right distribution for highly skewed zero-inflated clinical data**. *Epidemiology Biostatistics and Public Health*. 2013; 10:e8732-1-15.
43. Gurvitz M, Valente AM, Broberg C, Cook S, Stout K, Kay J, Ting J, Kuehl K, Earing M, Webb G, Houser L, Opotowsky A, Harmon A, Graham D, Khairy P, Gianola A, Verstappen A, Landzberg M, Alliance for Adult Research in Congenital C, Adult Congenital Heart A. **Prevalence and Predictors of Gaps in Care Among Adult Congenital Heart Disease Patients: HEART-ACHD (The Health, Education, and Access Research Trial)**. *J Am Coll Cardiol*. 2013; 61:2180-4.
44. Hampl S, Demeule M, Eneli I, Frank M, Hawkins MJ, Kirk S, Morris P, Sallinen BJ, Santos M, Ward WL, Rhodes E. **Parent perspectives on attrition from tertiary care pediatric weight management programs**. *Clin Pediatr (Phila)*. 2013; 52:513-9.
45. Hanke SP, Gardner AB, Lombardi JP, Manning PB, Nelson DP, Towbin JA, Jefferies JL, Lorts A. **Left ventricular noncompaction cardiomyopathy in Barth syndrome: an example of an undulating cardiac phenotype necessitating mechanical circulatory support as a bridge to transplantation**. *Pediatr Cardiol*. 2012; 33:1430-4.
46. Hinton RB. **Genetics of Bicuspid Aortic Valve and Calcific Aortic Valve Disease**. In: E Aikawa, ed. *Calcific Aortic Valve Disease*. Rijeka, Croatia: InTech; 2013:173-204.
47. Hinton RB. **Genetic and environmental factors contributing to cardiovascular malformation: a unified approach to risk**. *J Am Heart Assoc*. 2013; 2:e000292.
48. Hinton RB. **Bicuspid aortic valve and thoracic aortic aneurysm: three patient populations, two disease phenotypes, and one shared genotype**. *Cardiol Res Pract*. 2012; 2012:926975.
49. Hollander SA, Addonizio LJ, Chin C, Lamour JM, Hsu DT, Bernstein D, Rosenthal DN. **Abdominal complaints as a common first presentation of heart failure in adolescents with dilated cardiomyopathy**. *Am J Emerg Med*. 2013; 31:684-6.
50. Jayakumar C, Ranganathan P, Devarajan P, Krawczeski CD, Looney S, Ramesh G. **Semaphorin 3A is a new early diagnostic biomarker of experimental and pediatric acute kidney injury**. *PLoS One*. 2013; 8:e58446.
51. Jefferies JL, Goldstein SL. **Cardiorenal syndrome: an emerging problem in pediatric critical care**. *Pediatr Nephrol*. 2013; 28:855-62.
52. Jefferies JL, Morales DL. **Mechanical circulatory support in children: bridge to transplant versus recovery**. *Curr Heart Fail Rep*. 2012; 9:236-43.
53. Jodele S, Hirsch R, Laskin B, Davies S, Witte D, Chima R. **Pulmonary arterial hypertension in pediatric patients with hematopoietic stem cell transplant-associated thrombotic microangiopathy**. *Biol Blood Marrow Transplant*. 2013; 19:202-7.

54. Kimball TR, Michelfelder EC. **Echocardiography: Basic Principles and Imaging**. In: HD Allen, DJ Driscoll, RE Shaddy, TF Feltes, eds. *Moss & Adams' Heart Disease in Infants, Children and Adolescents: Including the Fetus and Young Adult*. Philadelphia, PA: Lippincott Williams & Wilkins; 2012:134-171.
55. Kirk S, Brehm B, Saelens BE, Woo JG, Kissel E, D'Alessio D, Bolling C, Daniels SR. **Role of carbohydrate modification in weight management among obese children: a randomized clinical trial**. *J Pediatr*. 2012; 161:320-7 e1.
56. Knowles R, Veldtman G, Hickey EJ, Bradley T, Gengsakul A, Webb GD, Williams WG, McCrindle BW. **Functional health status of adults with tetralogy of Fallot: matched comparison with healthy siblings**. *Ann Thorac Surg*. 2012; 94:124-32.
57. Knudson JD, Neish SR, Cabrera AG, Lowry AW, Shamszad P, Morales DL, Graves DE, Williams EA, Rossano JW. **Prevalence and outcomes of pediatric in-hospital cardiopulmonary resuscitation in the United States: An analysis of the Kids' Inpatient Database\***. *Crit Care Med*. 2012; 40:2940-4.
58. Kreeger RN, Ramamoorthy C, Nicolson SC, Ames WA, Hirsch R, Peng LF, Glatz AC, Hill KD, Hoffman J, Tomasson J, Kurth CD. **Evaluation of pediatric near-infrared cerebral oximeter for cardiac disease**. *Ann Thorac Surg*. 2012; 94:1527-33.
59. Lalani SR, Shaw C, Wang X, Patel A, Patterson LW, Kolodziejska K, Szafranski P, Ou Z, Tian Q, Kang SH, Jinnah A, Ali S, Malik A, Hixson P, Potocki L, Lupski JR, Stankiewicz P, Bacino CA, Dawson B, Beaudet AL, Boricha FM, Whittaker R, Li C, Ware SM, Cheung SW, Penny DJ, Jeffries JL, Belmont JW. **Rare DNA copy number variants in cardiovascular malformations with extracardiac abnormalities**. *Eur J Hum Genet*. 2013; 21:173-81.
60. Learn CP, Holzer RJ, Daniels CJ, Torres AJ, Vincent JA, Moore JW, Armsby LB, Landzberg MJ, Bergersen L. **Adverse events rates and risk factors in adults undergoing cardiac catheterization at pediatric hospitals-results from the C3PO**. *Catheter Cardiovasc Interv*. 2013; 81:997-1005.
61. Lorts A, Krawczeski CD, Marino BS. **Cardiology**. In: BS Marino, KS Fine, eds. *Blueprints: Pediatrics*. Philadelphia, PA: Lippincott Williams & Wilkins; 2013:86-133.
62. Lorts A, Schwanekamp JA, Baudino TA, McNally EM, Molkentin JD. **Deletion of periostin reduces muscular dystrophy and fibrosis in mice by modulating the transforming growth factor-beta pathway**. *Proc Natl Acad Sci U S A*. 2012; 109:10978-83.
63. Lozano R, Naghavi M, Foreman K, Lim S, Shibuya K, Aboyans V, Abraham J, Adair T, Aggarwal R, Ahn SY, Alvarado M, Anderson HR, Anderson LM, Andrews KG, Atkinson C, Baddour LM, Barker-Collo S, Bartels DH, Bell ML, Benjamin EJ, Bennett D, Bhalla K, Bikbov B, Bin Abdulhak A, Birbeck G, Blyth F, Bolliger I, Boufous S, Bucello C, Burch M, Burney P, Carapetis J, Chen H, Chou D, Chugh SS, Coffeng LE, Colan SD, Colquhoun S, Colson KE, Condon J, Connor MD, Cooper LT, Corriere M, Cortinovis M, de Vaccaro KC, Couser W, Cowie BC, Criqui MH, Cross M, Dabhadkar KC, Dahodwala N, De Leo D, Degenhardt L, Delossantos A, Denenberg J, Des Jarlais DC, Dharmaratne SD, Dorsey ER, Driscoll T, Duber H, Ebel B, Erwin PJ, Espindola P, Ezzati M, Feigin V, Flaxman AD, Forouzanfar MH, Fowkes FG, Franklin R, Fransen M, Freeman MK, Gabriel SE, Gakidou E, Gaspari F, Gillum RF, Gonzalez-Medina D, Halasa YA, Haring D, Harrison JE, Havmoeller R, Hay RJ, Hoen B, Hotez PJ, Hoy D, Jacobsen KH, James SL, Jasrasaria R, Jayaraman S, Johns N, Karthikeyan G, Kassebaum N, Keren A, Khoo JP, Knowlton LM, Kobusingye O, Koranteng A, Krishnamurthi R, Lipnick M, Lipshultz SE, Ohno SL, Mabweijano J, MacIntyre MF, Mallinger L, March L, Marks GB, Marks R, Matsumori A, Matzopoulos R, Mayosi BM, McAnulty JH, McDermott MM, McGrath J, Mensah GA, Merriman TR, Michaud C, Miller M, Miller TR, Mock C, Mocumbi AO, Mokdad AA, Moran A, Mulholland K, Nair MN, Naldi L, Narayan KM, Nasseri K, Norman P, O'Donnell M, Omer SB, Ortblad K, Osborne R, Ozgediz D, Pahari B, Pandian JD, Rivero AP, Padilla RP, Perez-Ruiz F, Perico N, Phillips D, Pierce K, Pope CA, 3rd, Porrini E, Pourmalek F, Raju M,

Ranganathan D, Rehm JT, Rein DB, Remuzzi G, Rivara FP, Roberts T, De Leon FR, Rosenfeld LC, Rushton L, Sacco RL, Salomon JA, Sampson U, Sanman E, Schwebel DC, Segui-Gomez M, Shepard DS, Singh D, Singleton J, Sliwa K, Smith E, Steer A, Taylor JA, Thomas B, Tleyjeh IM, Towbin JA, Truelson T, Undurraga EA, Venketasubramanian N, Vijayakumar L, Vos T, Wagner GR, Wang M, Wang W, Watt K, Weinstock MA, Weintraub R, Wilkinson JD, Woolf AD, Wulf S, Yeh PH, Yip P, Zabetian A, Zheng ZJ, Lopez AD, Murray CJ, AlMazroa MA, Memish ZA. **Global and regional mortality from 235 causes of death for 20 age groups in 1990 and 2010: a systematic analysis for the Global Burden of Disease Study 2010.** *Lancet.* 2012; 380:2095-128.

64. Madsen NL, Drezner JA, Salerno JC. **Sudden cardiac death screening in adolescent athletes: an evaluation of compliance with national guidelines.** *Br J Sports Med.* 2013; 47:172-7.
65. Madsen NL, Schwartz SM, Lewin MB, Mueller BA. **Prepregnancy Body Mass Index and Congenital Heart Defects among Offspring: A Population-based Study.** *Congenit Heart Dis.* 2013; 8:131-41.
66. Madueme PC, Khoury PR, Urbina EM, Kimball TR. **Predictors of exaggerated exercise-induced systolic blood pressures in young patients after coarctation repair.** *Cardiol Young.* 2013; 23:416-22.
67. Mahle WT, Lu M, Ohye RG, William Gaynor J, Goldberg CS, Sleeper LA, Pemberton VL, Mussatto KA, Williams IA, Sood E, Krawczeski CD, Lewis A, Mirarchi N, Scheurer M, Pasquali SK, Pinto N, Jacobs JP, McCrindle BW, Newburger JW. **A predictive model for neurodevelopmental outcome after the Norwood procedure.** *Pediatr Cardiol.* 2013; 34:327-33.
68. Malatesta-Muncher R, Wansapura J, Taylor M, Lindquist D, Hor K, Mitsnefes M. **Early cardiac dysfunction in pediatric patients on maintenance dialysis and post kidney transplant.** *Pediatr Nephrol.* 2012; 27:1157-64.
69. Marcus FI, Edson S, Towbin JA. **Genetics of arrhythmogenic right ventricular cardiomyopathy: a practical guide for physicians.** *J Am Coll Cardiol.* 2013; 61:1945-8.
70. Marino BS. **Evaluation of Quality of Life in Children and Adolescents with Congenital and Acquired Heart Disease.** In: HD Allen, DJ Driscoll, RE Shaddy, TF Feltes, eds. *Moss & Adams' Heart Disease in Infants, Children and Adolescents: Including the Fetus and Young Adult.* Philadelphia, PA: Lippincott Williams & Wilkins; 2012:1608-1621.
71. Marino BS, Lipkin PH, Newburger JW, Peacock G, Gerdes M, Gaynor JW, Mussatto KA, Uzark K, Goldberg CS, Johnson WH, Jr., Li J, Smith SE, Bellinger DC, Mahle WT. **Neurodevelopmental Outcomes in Children With Congenital Heart Disease: Evaluation and Management: A Scientific Statement From the American Heart Association.** *Circulation.* 2012; 126:1143-1172.
72. Marino BS, Tibby SM, Hoffman GM. **Resuscitation of the Patient with the Functionally Univentricular Heart.** *Current Pediatric Reviews.* 2013; 9:148-157.
73. Mathias A, Moss AJ, Lopes CM, Barsheshet A, McNitt S, Zareba W, Robinson JL, Locati EH, Ackerman MJ, Benhorin J, Kaufman ES, Platonov PG, Qi M, Shimizu W, Towbin JA, Michael Vincent G, Wilde AA, Zhang L, Goldenberg I. **Prognostic implications of mutation-specific QTc standard deviation in congenital long QT syndrome.** *Heart Rhythm.* 2013; 10:720-5.
74. Miyake CY, Webster G, Czosek RJ, Kantoch MJ, Dubin AM, Avasarala K, Atallah J. **Efficacy of implantable cardioverter defibrillators in young patients with catecholaminergic polymorphic ventricular tachycardia: success depends on substrate.** *Circ Arrhythm Electrophysiol.* 2013; 6:579-87.
75. Molina KM, Garcia X, Denfield SW, Fan Y, Morrow WR, Towbin JA, Frazier EA, Nelson DP. **Parvovirus B19 myocarditis causes significant morbidity and mortality in children.** *Pediatr Cardiol.* 2013; 34:390-7.
76. Moore J, Hegde S, El-Said H, Beekman R, 3rd, Benson L, Bergersen L, Holzer R, Jenkins K, Ringel R, Rome J, Vincent R, Martin G, Committee AIS. **Transcatheter device closure of atrial septal defects: a**

**safety review.** JACC Cardiovasc Interv. 2013; 6:433-42.

77. Mullally J, Goldenberg I, Moss AJ, Lopes CM, Ackerman MJ, Zareba W, McNitt S, Robinson JL, Benhorin J, Kaufman ES, Towbin JA, Barsheheshet A. **Risk of life-threatening cardiac events among patients with long QT syndrome and multiple mutations.** Heart Rhythm. 2012; 10:378-82.
78. Murray CJ, Vos T, Lozano R, Naghavi M, Flaxman AD, Michaud C, Ezzati M, Shibuya K, Salomon JA, Abdalla S, Aboyans V, Abraham J, Ackerman I, Aggarwal R, Ahn SY, Ali MK, Alvarado M, Anderson HR, Anderson LM, Andrews KG, Atkinson C, Baddour LM, Bahalim AN, Barker-Collo S, Barrero LH, Bartels DH, Basáñez MG, Baxter A, Bell ML, Benjamin EJ, Bennett D, Bernabé E, Bhalla K, Bhandari B, Bikbov B, Bin Abdulhak A, Birbeck G, Black JA, Blencowe H, Blore JD, Blyth F, Bolliger I, Bonaventure A, Boufous S, Bourne R, Boussinesq M, Braithwaite T, Brayne C, Bridgett L, Brooker S, Brooks P, Brugha TS, Bryan-Hancock C, Bucello C, Buchbinder R, Buckle G, Budke CM, Burch M, Burney P, Burstein R, Calabria B, Campbell B, Canter CE, Carabin H, Carapetis J, Carmona L, Cella C, Charlson F, Chen H, Cheng AT, Chou D, Chugh SS, Coffeng LE, Colan SD, Colquhoun S, Colson KE, Condon J, Connor MD, Cooper LT, Corriere M, Cortinovis M, de Vaccaro KC, Couser W, Cowie BC, Criqui MH, Cross M, Dabhadkar KC, Dahiya M, Dahodwala N, Damsere-Derry J, Danaei G, Davis A, De Leo D, Degenhardt L, Dellavalle R, Delossantos A, Denenberg J, Derrett S, Des Jarlais DC, Dharmaratne SD, Dherani M, Diaz-Torne C, Dolk H, Dorsey ER, Driscoll T, Duber H, Ebel B, Edmond K, Elbaz A, Ali SE, Erskine H, Erwin PJ, Espindola P, Ewoigbokhan SE, Farzadfar F, Feigin V, Felson DT, Ferrari A, Ferri CP, Fevre EM, Finucane MM, Flaxman S, Flood L, Foreman K, Forouzanfar MH, Fowkes FG, Fransen M, Freeman MK, Gabbe BJ, Gabriel SE, Gakidou E, Ganatra HA, Garcia B, Gaspari F, Gillum RF, Gmel G, Gonzalez-Medina D, Gosselin R, Grainger R, Grant B, Groeger J, Guillemin F, Gunnell D, Gupta R, Haagsma J, Hagan H, Halasa YA, Hall W, Haring D, Haro JM, Harrison JE, Havmoeller R, Hay RJ, Higashi H, Hill C, Hoen B, Hoffman H, Hotez PJ, Hoy D, Huang JJ, Ibeanusi SE, Jacobsen KH, James SL, Jarvis D, Jasrasaria R, Jayaraman S, Johns N, Jonas JB, Karthikeyan G, Kassebaum N, Kawakami N, Keren A, Khoo JP, King CH, Knowlton LM, Kobusingye O, Koranteng A, Krishnamurthi R, Laden F, Laloo R, Laslett LL, Lathlean T, Leasher JL, Lee YY, Leigh J, Levinson D, Lim SS, Limb E, Lin JK, Lipnick M, Lipshultz SE, Liu W, Loane M, Ohno SL, Lyons R, Mabweijano J, MacIntyre MF, Malekzadeh R, Mallinger L, Manivannan S, Marques W, March L, Margolis DJ, Marks GB, Marks R, Matsumori A, Matzopoulos R, Mayosi BM, McAnulty JH, McDermott MM, McGill N, McGrath J, Medina-Mora ME, Meltzer M, Mensah GA, Merriman TR, Meyer AC, Miglioli V, Miller M, Miller TR, Mitchell PB, Mock C, Mocumbi AO, Moffitt TE, Mokdad AA, Monasta L, Montico M, Moradi-Lakeh M, Moran A, Morawska L, Mori R, Murdoch ME, Mwaniki MK, Naidoo K, Nair MN, Naldi L, Narayan KM, Nelson PK, Nelson RG, Nevitt MC, Newton CR, Nolte S, Norman P, Norman R, O'Donnell M, O'Hanlon S, Olives C, Omer SB, Ortblad K, Osborne R, Ozgediz D, Page A, Pahari B, Pandian JD, Rivero AP, Patten SB, Pearce N, Padilla RP, Perez-Ruiz F, Perico N, Pesudovs K, Phillips D, Phillips MR, Pierce K, Pion S, Polanczyk GV, Polinder S, Pope CA, 3rd, Popova S, Porrini E, Pourmalek F, Prince M, Pullan RL, Ramaiah KD, Ranganathan D, Razavi H, Regan M, Rehm JT, Rein DB, Remuzzi G, Richardson K, Rivara FP, Roberts T, Robinson C, De Leon FR, Ronfani L, Room R, Rosenfeld LC, Rushton L, Sacco RL, Saha S, Sampson U, Sanchez-Riera L, Sanman E, Schwebel DC, Scott JG, Segui-Gomez M, Shahraz S, Shepard DS, Shin H, Shivakoti R, Singh D, Singh GM, Singh JA, Singleton J, Sleet DA, Sliwa K, Smith E, Smith JL, Stapelberg NJ, Steer A, Steiner T, Stolk WA, Stovner LJ, Sudfeld C, Syed S, Tamburlini G, Tavakkoli M, Taylor HR, Taylor JA, Taylor WJ, Thomas B, Thomson WM, Thurston GD, Tleyjeh IM, Tonelli M, Towbin JA, Truelsen T, Tsilimbaris MK, Ubeda C, Undurraga EA, van der Werf MJ, van Os J, Vavilala MS, Venketasubramanian N, Wang M, Wang W, Watt K, Weatherall DJ, Weinstock MA, Weintraub R, Weisskopf MG, Weissman MM, White RA, Whiteford H, Wiebe N, Wiersma ST, Wilkinson JD, Williams HC, Williams SR, Witt E, Wolfe F, Woolf AD, Wulf S, Yeh

PH, Zaidi AK, Zheng ZJ, Zonies D, Lopez AD, AlMazroa MA, Memish ZA. **Disability-adjusted life years (DALYs) for 291 diseases and injuries in 21 regions, 1990-2010: a systematic analysis for the Global Burden of Disease Study 2010.** *Lancet.* 2012; 380:2197-223.

79. Ngamprasertwong P, Michelfelder EC, Arbab S, Choi YS, Statile C, Ding L, Boat A, Eghtesady P, Holland K, Sadhasivam S. **Anesthetic Techniques for Fetal Surgery: Effects of Maternal Anesthesia on Intraoperative Fetal Outcomes in a Sheep Model.** *Anesthesiology.* 2013; 118:796-808.
80. Perman M, Lucky A, Marino BS. **Dermatology.** In: BS Marino, KS Fine, eds. *Blueprints: Pediatrics.* Philadelphia, PA: Lippincott Williams & Wilkins; 2013:74-85.
81. Pietra BA, Kantor PF, Bartlett HL, Chin C, Canter CE, Larsen RL, Edens RE, Colan SD, Towbin JA, Lipshultz SE, Kirklin JK, Naftel DC, Hsu DT. **Early predictors of survival to and after heart transplantation in children with dilated cardiomyopathy.** *Circulation.* 2012; 126:1079-86.
82. Pike NA, Pemberton V, Allen K, Jacobs JP, Hsu DT, Lewis AB, Ghanayem N, Lambert L, Crawford K, Atz T, Korsin R, Xu M, Ravishankar C, Cnota J, Pearson GD. **Challenges and successes of recruitment in the "angiotensin-converting enzyme inhibition in infants with single ventricle trial" of the Pediatric Heart Network.** *Cardiol Young.* 2013; 23:248-57.
83. Powers C, Huang Y, Strauss A, Khuchua Z. **Diminished Exercise Capacity and Mitochondrial bc1 Complex Deficiency in Tafazzin-Knockdown Mice.** *Front Physiol.* 2013; 4:74.
84. Prada CE, Jefferies JL, Grenier MA, Huth CM, Page KI, Spicer RL, Towbin JA, Leslie ND. **Malonyl coenzyme A decarboxylase deficiency: early dietary restriction and time course of cardiomyopathy.** *Pediatrics.* 2012; 130:e456-60.
85. Punn R, Obayashi DY, Olson I, Kazmucha JA, DePucci A, Hurley MP, Chin C. **Supine exercise echocardiographic measures of systolic and diastolic function in children.** *J Am Soc Echocardiogr.* 2012; 25:773-81.
86. Quinn CT, Smith FO, Marino BS. **Hematology.** In: BS Marino, KS Fine, eds. *Blueprints: Pediatrics.* Philadelphia, PA: Lippincott Williams & Wilkins; 2013:179-204.
87. Ravishankar C, Zak V, Williams IA, Bellinger DC, Gaynor JW, Ghanayem NS, Krawczeski CD, Licht DJ, Mahony L, Newburger JW, Pemberton VL, Williams RV, Sananes R, Cook AL, Atz T, Khaikin S, Hsu DT, Pediatric Heart Network I. **Association of impaired linear growth and worse neurodevelopmental outcome in infants with single ventricle physiology: a report from the pediatric heart network infant single ventricle trial.** *J Pediatr.* 2013; 162:250-6 e2.
88. Roos-Hesselink JW, Ruys TP, Stein JI, Thilén U, Webb GD, Niwa K, Kaemmerer H, Baumgartner H, Budts W, Maggioni AP, Tavazzi L, Taha N, Johnson MR, Hall R, Investigators R. **Outcome of pregnancy in patients with structural or ischaemic heart disease: results of a registry of the European Society of Cardiology.** *Eur Heart J.* 2013; 34:657-65.
89. Rutter MM, Collins J, Rose SR, Woo JG, Sucharew H, Sawnani H, Hor KN, Cripe LH, Wong BL. **Growth hormone treatment in boys with Duchenne muscular dystrophy and glucocorticoid-induced growth failure.** *Neuromuscul Disord.* 2012; 22:1046-56.
90. Ryan TD, Taylor MD, Mazur W, Cripe LH, Pratt J, King EC, Lao K, Grenier MA, Jefferies JL, Benson DW, Hor KN. **Abnormal circumferential strain is present in young Duchenne muscular dystrophy patients.** *Pediatr Cardiol.* 2013; 34:1159-65.
91. Ryan TD, Ware SM, Lucky AW, Towbin JA, Jefferies JL, Hinton RB. **Left ventricular noncompaction cardiomyopathy and aortopathy in a patient with recessive dystrophic epidermolysis bullosa.** *Circ Heart Fail.* 2012; 5:e81-2.
92. Rychik J, Veldtman G, Rand E, Russo P, Rome JJ, Krok K, Goldberg DJ, Cahill AM, Wells RG. **The precarious state of the liver after a Fontan operation: summary of a multidisciplinary symposium.**

*Pediatr Cardiol.* 2012; 33:1001-12.

93. Selamet Tierney ES, Levine JC, Chen S, Bradley TJ, Pearson GD, Colan SD, Sleeper LA, Campbell MJ, Cohen MS, De Backer J, Guey LT, Heydarian H, Lai WW, Lewin MB, Marcus E, Mart CR, Pignatelli RH, Printz BF, Sharkey AM, Shirali GS, Srivastava S, Lacro RV, Pediatric Heart Network I. **Echocardiographic methods, quality review, and measurement accuracy in a randomized multicenter clinical trial of marfan syndrome.** *J Am Soc Echocardiogr.* 2013; 26:657-66.
94. Shah AS, Dolan LM, Lauer A, Davis C, Dabelea D, Daniels SR, Hamman RF, Marcovina S, Wadwa RP, Urbina EM. **Adiponectin and arterial stiffness in youth with type 1 diabetes: the SEARCH for diabetes in youth study.** *J Pediatr Endocrinol Metab.* 2012; 25:717-21.
95. Shamszad P, Cabrera AG, Kim JJ, Moffett BS, Graves DE, Heinle JS, Rossano JW. **Perioperative atrial tachycardia is associated with increased mortality in infants undergoing cardiac surgery.** *J Thorac Cardiovasc Surg.* 2012; 144:396-401.
96. Shamszad P, Moore RA, Ghanayem N, Cooper DS. **Intensive care management of neonates with d-transposition of the great arteries and common arterial trunk.** *Cardiol Young.* 2012; 22:755-60.
97. Slicker J, Hehir DA, Horsley M, Monczka J, Stern KW, Roman B, Ocampo EC, Flanagan L, Keenan E, Lambert LM, Davis D, Lamonica M, Rollison N, Heydarian H, Anderson JB. **Nutrition Algorithms for Infants with Hypoplastic Left Heart Syndrome; Birth through the First Interstage Period.** *Congenit Heart Dis.* 2013; 8:89-102.
98. Sobolewski B, Grupp-Phelan J, Marino BS. **Emergency Medicine: The Critically Ill and Injured Child.** In: BS Marino, KS Fine, eds. *Blueprints: Pediatrics.* Philadelphia, PA: Lippincott Williams & Wilkins; 2013:336-353.
99. Spar DS, Anderson JB, Palumbo JS, Kukreja KU, Czosek RJ. **Symptomatic upper-extremity deep venous thrombosis after pacemaker placement in a pediatric patient: how to treat?** *Pediatr Cardiol.* 2013; 34:1275-9.
100. Stapleton GE, Wilmot I, Suh EJ. **Cardiac catheterisation of patients with common arterial trunk and transposition of the great arteries.** *Cardiol Young.* 2012; 22:687-90.
101. Statile CJ, Cnota JF, Gomien S, Divanovic A, Crombleholme T, Michelfelder E. **Estimated cardiac output and cardiovascular profile score in fetuses with high cardiac output lesions.** *Ultrasound Obstet Gynecol.* 2013; 41:54-8.
102. Szafranski P, Dharmadhikari AV, Brosens E, Gurha P, Kolodziejska KE, Zhishuo O, Dittwald P, Majewski T, Mohan KN, Chen B, Person RE, Tibboel D, de Klein A, Pinner J, Chopra M, Malcolm G, Peters G, Arbuckle S, Guiang SF, 3rd, Hustead VA, Jessurun J, Hirsch R, Witte DP, Maystadt I, Sebire N, Fisher R, Langston C, Sen P, Stankiewicz P. **Small noncoding differentially methylated copy-number variants, including lncRNA genes, cause a lethal lung developmental disorder.** *Genome Res.* 2013; 23:23-33.
103. Tabbutt S, Ghanayem N, Ravishankar C, Sleeper LA, Cooper DS, Frank DU, Lu M, Pizarro C, Frommelt P, Goldberg CS, Graham EM, Krawczeski CD, Lai WW, Lewis A, Kirsh JA, Mahony L, Ohye RG, Simsic J, Lodge AJ, Spurrier E, Stylianou M, Laussen P. **Risk factors for hospital morbidity and mortality after the Norwood procedure: A report from the Pediatric Heart Network Single Ventricle Reconstruction trial.** *J Thorac Cardiovasc Surg.* 2012; 144:882-95.
104. Towbin JA, Lorts A, Jefferies JL. **Myocarditis.** In: HD Allen, DJ Driscoll, RE Shaddy, TF Feltes, eds. *Moss & Adams' Heart Disease in Infants, Children and Adolescents: Including the Fetus and Young Adult.* Philadelphia, PA: Lippincott Williams & Wilkins; 2012:1247-1266.
105. Towbin JA, Ware SM, Jefferies JL. **Congenital Cardiomyopathies.** In: JA Hill, EN Olson, eds. *Muscle: Fundamental Biology and Mechanisms of Disease.* Waltham, MA: Academic Press; 2012:459-472.

106. Trasande L, Fiorino EK, Attina T, Berger K, Goldring R, Chemtob C, Levy-Carrick N, Shao Y, Liu M, Urbina E, Reibman J. **Associations of World Trade Center exposures with pulmonary and cardiometabolic outcomes among children seeking care for health concerns.** *Sci Total Environ.* 2013; 444:320-6.
107. Tweddell JS, Sleeper LA, Ohye RG, Williams IA, Mahony L, Pizarro C, Pemberton VL, Frommelt PC, Bradley SM, Cnota JF, Hirsch J, Kirshbom PM, Li JS, Pike N, Puchalski M, Ravishankar C, Jacobs JP, Laussen PC, McCrindle BW. **Intermediate-term mortality and cardiac transplantation in infants with single-ventricle lesions: risk factors and their interaction with shunt type.** *J Thorac Cardiovasc Surg.* 2012; 144:152-9.
108. Urbina EM, Khouri PR, McCoy CE, Dolan LM, Daniels SR, Kimball TR. **Triglyceride to HDL-C Ratio and Increased Arterial Stiffness in Children, Adolescents, and Young Adults.** *Pediatrics.* 2013; 131:e1082-90.
109. Uzark K, King E, Spicer R, Beekman R, Kimball T, Varni JW. **The Clinical Utility of Health-related Quality of Life Assessment in Pediatric Cardiology Outpatient Practice.** *Congenit Heart Dis.* 2013; 8:211-8.
110. Villa CR, Marino BS, Jacobs JP, Cooper DS. **Intensive care and perioperative management of neonates with functionally univentricular hearts.** *World J Pediatr Congenit Heart Surg.* 2012; 3:359-63.
111. Vos T, Flaxman AD, Naghavi M, Lozano R, Michaud C, Ezzati M, Shibuya K, Salomon JA, Abdalla S, Aboyans V, Abraham J, Ackerman I, Aggarwal R, Ahn SY, Ali MK, Alvarado M, Anderson HR, Anderson LM, Andrews KG, Atkinson C, Baddour LM, Bahalim AN, Barker-Collo S, Barrero LH, Bartels DH, Basáñez MG, Baxter A, Bell ML, Benjamin EJ, Bennett D, Bernabé E, Bhalla K, Bhandari B, Bikbov B, Bin Abdulhak A, Birbeck G, Black JA, Blencowe H, Blore JD, Blyth F, Bolliger I, Bonaventure A, Boufous S, Bourne R, Boussinesq M, Braithwaite T, Brayne C, Bridgett L, Brooker S, Brooks P, Brugha TS, Bryan-Hancock C, Bucello C, Buchbinder R, Buckle G, Budke CM, Burch M, Burney P, Burstein R, Calabria B, Campbell B, Canter CE, Carabin H, Carapetis J, Carmona L, Cella C, Charlson F, Chen H, Cheng AT, Chou D, Chugh SS, Coffeng LE, Colan SD, Colquhoun S, Colson KE, Condon J, Connor MD, Cooper LT, Corriere M, Cortinovis M, de Vaccaro KC, Couser W, Cowie BC, Criqui MH, Cross M, Dabhadkar KC, Dahiya M, Dahodwala N, Damsere-Derry J, Danaei G, Davis A, De Leo D, Degenhardt L, Dellavalle R, Delossantos A, Denenberg J, Derrett S, Des Jarlais DC, Dharmaratne SD, Dherani M, Diaz-Torne C, Dolk H, Dorsey ER, Driscoll T, Duber H, Ebel B, Edmond K, Elbaz A, Ali SE, Erskine H, Erwin PJ, Espindola P, Ewoigbokhan SE, Farzadfar F, Feigin V, Felson DT, Ferrari A, Ferri CP, Fevre EM, Finucane MM, Flaxman S, Flood L, Foreman K, Forouzanfar MH, Fowkes FG, Franklin R, Fransen M, Freeman MK, Gabbe BJ, Gabriel SE, Gakidou E, Ganatra HA, Garcia B, Gaspari F, Gillum RF, Gmel G, Gosselin R, Grainger R, Groeger J, Guillemin F, Gunnell D, Gupta R, Haagsma J, Hagan H, Halasa YA, Hall W, Haring D, Haro JM, Harrison JE, Havmoeller R, Hay RJ, Higashi H, Hill C, Hoen B, Hoffman H, Hotez PJ, Hoy D, Huang JJ, Ibeanusi SE, Jacobsen KH, James SL, Jarvis D, Jasrasaria R, Jayaraman S, Johns N, Jonas JB, Karthikeyan G, Kassebaum N, Kawakami N, Keren A, Khoo JP, King CH, Knowlton LM, Kobusingye O, Koranteng A, Krishnamurthi R, Laloo R, Laslett LL, Lathlean T, Leasher JL, Lee YY, Leigh J, Lim SS, Limb E, Lin JK, Lipnick M, Lipshultz SE, Liu W, Loane M, Ohno SL, Lyons R, Ma J, Mabweijano J, MacIntyre MF, Malekzadeh R, Mallinger L, Manivannan S, Marques W, March L, Margolis DJ, Marks GB, Marks R, Matsumori A, Matzopoulos R, Mayosi BM, McAnulty JH, McDermott MM, McGill N, McGrath J, Medina-Mora ME, Meltzer M, Mensah GA, Merriman TR, Meyer AC, Miglioli V, Miller M, Miller TR, Mitchell PB, Mocumbi AO, Moffitt TE, Mokdad AA, Monasta L, Montico M, Moradi-Lakeh M, Moran A, Morawska L, Mori R, Murdoch ME, Mwaniki MK, Naidoo K, Nair MN, Naldi L, Narayan KM, Nelson PK, Nelson RG, Nevitt MC, Newton CR, Nolte S, Norman P, Norman R, O'Donnell M, O'Hanlon S, Olives C, Omer SB,

Ortblad K, Osborne R, Ozgediz D, Page A, Pahari B, Pandian JD, Rivero AP, Patten SB, Pearce N, Padilla RP, Perez-Ruiz F, Perico N, Pesudovs K, Phillips D, Phillips MR, Pierce K, Pion S, Polanczyk GV, Polinder S, Pope CA, 3rd, Popova S, Porrini E, Pourmalek F, Prince M, Pullan RL, Ramaiah KD, Ranganathan D, Razavi H, Regan M, Rehm JT, Rein DB, Remuzzi G, Richardson K, Rivara FP, Roberts T, Robinson C, De Leon FR, Ronfani L, Room R, Rosenfeld LC, Rushton L, Sacco RL, Saha S, Sampson U, Sanchez-Riera L, Sanman E, Schwebel DC, Scott JG, Segui-Gomez M, Shahraz S, Shepard DS, Shin H, Shivakoti R, Singh D, Singh GM, Singh JA, Singleton J, Sleet DA, Sliwa K, Smith E, Smith JL, Stapelberg NJ, Steer A, Steiner T, Stolk WA, Stovner LJ, Sudfeld C, Syed S, Tamburlini G, Tavakkoli M, Taylor HR, Taylor JA, Taylor WJ, Thomas B, Thomson WM, Thurston GD, Tleyjeh IM, Tonelli M, Towbin JA, Truelsen T, Tsilimbaris MK, Ubeda C, Undurraga EA, van der Werf MJ, van Os J, Vavilala MS, Venketasubramanian N, Wang M, Wang W, Watt K, Weatherall DJ, Weinstock MA, Weintraub R, Weisskopf MG, Weissman MM, White RA, Whiteford H, Wiersma ST, Wilkinson JD, Williams HC, Williams SR, Witt E, Wolfe F, Woolf AD, Wulf S, Yeh PH, Zaidi AK, Zheng ZJ, Zonies D, Lopez AD, Murray CJ, AlMazroa MA, Memish ZA. **Years lived with disability (YLDs) for 1160 sequelae of 289 diseases and injuries 1990-2010: a systematic analysis for the Global Burden of Disease Study 2010.** *Lancet.* 2012; 380:2163-96.

112. Walsh M, Knilans TK, Anderson JB, Czosek RJ. **Successful treatment of pallid breath-holding spells with fluoxetine.** *Pediatrics.* 2012; 130:e685-9.
113. Walsh MA, Anderson JB, Knilans TK, Cottrill CM, Czosek RJ. **Ventricular "oversensing" in a biventricular pacemaker.** *Pacing Clin Electrophysiol.* 2012; 35:1014-7.
114. Webber SA, Lipshultz SE, Sleeper LA, Lu M, Wilkinson JD, Addonizio LJ, Canter CE, Colan SD, Everitt MD, Jefferies JL, Kantor PF, Lamour JM, Margossian R, Pahl E, Rusconi PG, Towbin JA. **Outcomes of Restrictive Cardiomyopathy in Childhood and the Influence of Phenotype: A Report From the Pediatric Cardiomyopathy Registry.** *Circulation.* 2012; 126:1237-1244.
115. West C, Bradley M, Fine KS, Marino BS. **Ophthalmology.** In: BS Marino, KS Fine, eds. *Blueprints: Pediatrics.* Philadelphia, PA: Lippincott Williams & Wilkins; 2013:327-335.
116. Wilkinson JD, Lowe AM, Salbert BA, Sleeper LA, Colan SD, Cox GF, Towbin JA, Connuck DM, Messere JE, Lipshultz SE. **Outcomes in children with Noonan syndrome and hypertrophic cardiomyopathy: A study from the Pediatric Cardiomyopathy Registry.** *Am Heart J.* 2012; 164:442-8.
117. Williams IA, Fifer C, Jaeggi E, Levine JC, Michelfelder EC, Szwast AL. **The association of fetal cerebrovascular resistance with early neurodevelopment in single ventricle congenital heart disease.** *Am Heart J.* 2013; 165:544-550 e1.
118. Wray J, Franklin R, Brown K, Cassedy A, Marino BS. **Testing the pediatric cardiac quality of life inventory in the United kingdom.** *Acta Paediatr.* 2013; 102:e68-73.
119. Yao J, Liu GR, Narmoneva DA, Hinton RB, Zhang ZQ. **Immersed smoothed finite element method for fluid-structure interaction simulation of aortic valves.** *Computational Mechanics.* 2012; 50:789-804.
120. Zampi JD, Hirsch JC, Goldstein BH, Armstrong AK. **Use of a Pressure Guidewire to Assess Pulmonary Artery Band Adequacy in the Hybrid Stage I Procedure for High-risk Neonates with Hypoplastic Left Heart Syndrome and Variants.** *Congenit Heart Dis.* 2013; 8:149-58.
121. Zappitelli M, Coca SG, Garg AX, Krawczeski CD, Thiessen Heather P, Sint K, Li S, Parikh CR, Devarajan P. **The association of albumin/creatinine ratio with postoperative AKI in children undergoing cardiac surgery.** *Clin J Am Soc Nephrol.* 2012; 7:1761-9.

## Faculty, Staff, and Trainees

### Faculty Members

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**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 H. Beekman, III, MD**, Professor

**Research Interests** Cardiac catheterization and intervention, quality improvement

**D. Woodrow Benson, MD, PhD**, Adjunct

**Research Interests** Cardiovascular genetics

**Castleberry Chesney, MD**, Assistant Professor

**Research Interests** Immune deficiencies after and responses to cardiac transplantation

**Clifford Chin, MD**, Professor

**Leadership** Medical Director, Pediatric Heart Transplant Service

**Research Interests** Cardiomyopathy, heart failure, and cardiac transplantation

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**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

**Richard J. Czosek, MD**, Assistant Professor

**Leadership** Director, Cardiac Rhythm Device Management

**Research Interests** Cardiac pacing device and arrhythmia management in pediatric patients with congenital heart disease and cardiomyopathy

**Allison Divanovic, MD**, Assistant Professor

**Research Interests** Fetal echocardiography

**Paula Goldenberg, MD, MSCE, MSW, FAAP, FACMG**, Assistant 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

**Leadership** Medical Director, Heart Institute Single Ventricle Clinic

**Research Interests** Echocardiography Synchrony/Strain Imaging and Quality Improvement

**Robert B. Hinton, MD**, Associate Professor

**Leadership** Director, Heart Institute BioRepository

**Research Interests** Cardiovascular genetics and developmental biology

**Russel Hirsch, MD**, Associate Professor

**Leadership** Director, Pulmonary Hypertension Service; Director, Cardiac Cath and Intervention

**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

**Ilias Iliopoulos, MD**, Assistant Professor

**Research Interests** Hemodynamic management and use of inotropes in cardiac intensive care

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

**Research Interests** Cardiovascular effects of pediatric obesity; cardiovascular effects of exercise; non-invasive cardiac imaging

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

**Leadership** Director, Advanced Heart Failure & Cardiomyopathy; 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**, Associate Professor

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

**Timothy Knilans, MD**, Professor

**Leadership** Director, Clinical Cardiac Electrophysiology; Director, Pediatric Cardiac Electrophysiology Fellowship; Director, Cardiac Exercise Laboratory

**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

**Christopher Learn, MD**, Assistant Professor

**Leadership** Co-Director, Adolescent and Adult Congenital Cardiology Fellowship Program

**Research Interests** Non-invasive imaging in congenital heart disease; adolescent/young adult transition care for persons with congenital heart disease; heart disease in pregnancy

**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

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**Research Interests** Heart failure and myocardial remodeling

**Madsen Nicolas, MD**, Assistant Professor

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**Research Interests** 3D Heart Modeling; Echo/MRI Quantification

**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, Heart Institute Imaging Service; 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, endocrine dysfunction in critical illness

**Enkhsaikhan Purevjav, MD, PhD**, Assistant Professor

**Research Interests** Genetics of Cardiovascular Disease

**Pirouz Shamszad, MD**, Assistant Professor

**Research Interests** Patient outcomes and quality improvement in pediatric cardiac intensive care

**Robert Siegel, MD**, Professor

**Leadership** Medical Director, The Center for Better Health and Nutrition

**David Spar, MD**, Assistant Professor

**Research Interests** Pediatric and congenital electrophysiology

**Joshua James Sticka, MD**, Assistant Professor

**Leadership** Co-Director, Heart Institute Resident & Medical Student Education

**Research Interests** Non-invasive cardiac imaging; myocardial mechanics

**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); Co-Director, The Heart Institute Imaging Service

**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

**Gruschen Veldtman, MBChB, FRCP, Professor**

**Leadership** Associate Director, AACHD Program; Inpatient Medical Director, AACHD Program

**Research Interests** The Fontan circulation and end-organ damage; risk stratification in high-risk pregnancy; pulmonary hypertension

**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

**Ivan Wilmot, MD, Assistant Professor**

**Research Interests** Quality of life in children with heart failure, transplant, and those requiring mechanical circulatory support

**Wenying Zhang, MD, PhD, FACMG, Assistant Professor**

**Leadership** Associate Director, Heart Institute Diagnostic Laboratory

**Research Interests** Clinical molecular genetics; molecular genetic diagnosis of heritable cardiovascular disease; molecular diagnosis of viral infection of the heart

**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**

**Catherine Allen, MD, PL4, A.I. duPont Children's**

**Konstantin Averin, MD, PL4, Cincinnati Children's Hospital/University of Cincinnati**

**Joshua Daily, MD, PL4, Cincinnati Children's Hospital/University of Cincinnati**

**Karine Guerrier, DO, PL4, Cleveland Clinic**

**Sam Hanke, MD, PL7, Cincinnati Children's Hospital/University of Cincinnati**

**Anne-Cecile Huby, PhD, Pierre and Marie Curie University, France**

**Varun Krishnamurthy, BS, University of Cincinnati**

**David Kwiatkowski, MD, PL5, Cincinnati Children's Hospital/University of Cincinnati**

**Benjamin Landis, MD, PL5, Columbia University**

**Sarkies Ruben Mattheus Martherus, PhD, Maastricht University, The Netherlands**

**Ryan Moore, MD, PL5, Cincinnati Children's Hospital/University of Cincinnati**

**Charu Munjal, PhD, University of Louisville**

**Thomas Ryan, MD, PhD, PL7, Cincinnati Children's Hospital/University of Cincinnati**

**Michael Seckeler, MD**, PL7, University of Virginia

**Christopher Statile, MD**, PL7, Cincinnati Children's Hospital/University of Cincinnati

**Aashoo Tandon, MD**, PL5, Cincinnati Children's Hospital/University of Cincinnati

**Tamara Thomas, MD**, PL6, Vanderbilt University

**Chet Villa, MD**, PL6, Cincinnati Children's Hospital/University of Cincinnati

## Division Collaboration

### **Adolescent Medicine** » Laurie A. Mitan, MD

We explored QT prolongation in adolescent patients admitted with eating disorders. We analyzed associated factors leading to QT prolongation as well as QT prolongation as a prognostic indicator of outcome and disease severity.

### **Allergy & Immunology** » Kimberly A. Risma, MD, PhD

Studying immune profiling, especially thymic markers, in patients who have received cardiac transplants and correlation with rates of infection, rejection, and death.

### **Behavioral Medicine & Clinical Psychology; Center for Adherence & Self-Management** » Dean W. Beebe, PhD and Dennis D. Drotar, PhD

Studying the impact of neurodevelopmental outcomes on quality of life on complex CHC survivors.

### **Behavioral Medicine & Clinical Psychology** » Michelle M. Ernst, PhD and Carrie Piazza-Waggoner, PhD

Studying psychosocial factors that predict quality of life in congenital heart disease surgical survivors.

### **Biostatistics & Epidemiology** » Jessica Woo, MHSA, PhD

This collaboration stems from shared interests in growth as a measure of health in the pediatric population. Specifically, we identified growth abnormalities in the fetus with hypoplastic left heart. The project was novel by utilizing fetal ultrasound measurement to understand growth trajectory.

### **Biostatistics & Epidemiology** » Jessica Woo, MHSA, PhD

Studying cardiovascular morbidity and mortality after 40 years follow-up in international cohorts.

### **Bone Marrow Transplantation & Immune Deficiency** » Stella M. Davies, MBBS, PhD, MRCP

This collaboration focuses on the detection of chem-induced cardiotoxicity in the BMT population as well as those exposed to anthracyclines. We are seeing all patients in referral as well as performing novel imaging to detect cardiac involvement.

### **Center for Acute Nephrology** » Stuart Goldstein, MD and Prasad Devarajan, MD

Collaboration on studies of acute kidney injury in cardiac patients, including patients with heart failure, Cardiorenal syndrome, and following cardiopulmonary bypass.

### **Center for Acute Nephrology** » Stuart Goldstein, MD

Studying the impact of hybrid procedure for HLHS on AKI and the incidence of CKD in patients experiencing AKI after CPB.

### **Center for Acute Nephrology** » Stuart Goldstein, MD

Studying the association of biomarkers and cardiac output in Fontan survivors.

### **Critical Care Medicine** » Derek Wheeler, MD

Impedance pressure regulatory device. A novel study in pediatric critical care medicine: basic science and clinical evidence.

### **Endocrinology** » Lawrence M. Dolan, MD and Amy Shah, MD

We are investigating the effects of diabetes on the cardiovascular system, specifically the progression of atherosclerosis in youth with obesity and T2DM and arterial stiffness in T1DM.

**Endocrinology » Lawrence M. Dolan, MD**

Studying Vitamin D levels and arterial stiffness.

**Endocrinology » Philippe F. Backeljauw, MD and Sarah Lawson, MD**

Studying arterial stiffness in Turner syndrome.

**Endocrinology » Amy Shah, MD**

Studying arterial Stiffness & HDL proteomics, as well as cerebrovascular and arterial change in T2DM.

**Endocrinology » Nancy A. Crimmins, MD**

We are researching the incidence of elevated left ventricular mass in severely obese toddlers and preschoolers.

**Experimental Hematology and Cancer Biology-Molecular Genetics » Punam Malik, MD**

Studying cardiovascular complications in sickle cell disease.

**Fetal Care Center » Mounira Habli, MD**

This collaboration stems from the multidisciplinary team that provides clinical care in the FCC. Specifically, we looked at the use of fetal echocardiography to guide clinical decision making in patients with high output cardiac lesions.

**Gastroenterology, Hepatology & Nutrition » Stavra A. Xanthakos, MD, MS and Maisam A. Abu-El-Haija, MD**

We are researching the presentation and management of hypertriglyceridemia-induced pancreatitis in children at Cincinnati Children's.

**Gastroenterology, Hepatology & Nutrition » Kathleen M. Campbell, MD**

Magnetic resonance elastography of the liver in patients post-Fontan procedure: feasibility and preliminary results.

**Gastroenterology, Hepatology & Nutrition » John C. Bucuvalas, MD and James E. Heubi, MD**

This is a clinical research study investigating cirrhotic cardiomyopathy in ESLD and liver transplantation.

**Hematology » Ralph A. Gruppo, MD**

This collaboration focuses on evaluating predictors of BT shunt occlusion assessing for hematologic predictors.

**Hematology; Pharmacy; Pediatric Surgery » Joseph S. Palumbo, MD, Alexander A. Vinks, PharmD, PhD, FCP, and Jason S. Frischer, MD**

We studied the effect of Antithrombin 3 on anticoagulation during mechanical circulatory support.

**Human Genetics » Nancy Doan Leslie, MD**

Studying outcomes of patients with fatty acid oxidation disorders.

**Human Genetics » Gregory A. Grabowski, MD and Robert J. Hopkin, MD**

This collaboration focuses on clinical investigation of patients with MPS and related cardiovascular disease characterization and treatment strategies.

**James M. Anderson Center for Health Systems Excellence » Carole Lannon, MD, MPH**

The National Pediatric Cardiology Quality Improvement Collaborative is a Learning Network of 50 pediatric cardiology centers working together and with families to improve the quality of life for children with complex congenital heart disease.

**Neonatology and Pulmonary Biology » Christina J. Valentine, MD**

Studying fish oil supplementation in pregnancy.

**Neonatology and Pulmonary Biology » Henry T. Akinbi, MD**

A case report of neonatal long QT interval in a child with a metabolic syndrome.

**Nephrology » Mark M. Mitsnefes, MD**

We are investigating the effects of chronic kidney disease on the cardiovascular system, specifically arterial stiffness in CKD.

**Nephrology » David K. Hooper, MD, MS**

Studying blood pressure in CKD.

**Nephrology » Jens W. Goebel, MD**

Assessing the prevalence of aortopathy in end stage renal disease.

**Nephrology » Jens W. Goebel, MD and David K. Hooper, MD, MS**

Assessing impact of kidney transplantation on aortopathy.

**Neurology » Brenda Wong, MD, MBBS**

This collaboration focuses on the DMD population, specifically the development of a multidisciplinary clinic as well as ongoing clinical trials.

**Neurology » Andrew D. Hershey, MD, PhD, FAHS**

CHAMP (Childhood and Adolescent Migraine Prevention) Study. The study is a multicenter study with up to 40 centers enrolling 675 participants. We are reading all of the electrocardiograms for the study and providing cardiology support.

**Pediatric Radiology » Janaka P. Wansapura, PhD**

Studying cardiac MRI imaging and phenotype correlation in animal models of cardiomyopathies.

**Pediatric Radiology » Patrick Winter, PhD**

Studying the utilization of novel experimental MRI contrast agent to non-invasively detect apoptotic cells in the heart.

**Pediatric Radiology; Gastroenterology, Hepatology & Nutrition » Daniel J. Podberesky, MD, Daniel B.**

Wallihan, MD, and Kathleen M. Campbell, MD

Studying the association of magnetic resonance elastography-determined liver stiffness with cardiac function after Fontan palliation.

**Pediatric Surgery » Thomas H. Inge, MD, PhD**

Conducting a comprehensive follow-up study of adolescent bariatric surgery at 5+ years post-operatively. The goal is to compare the long-term medical and psychosocial outcomes of surgical and non-surgical management of adolescents with severe obesity. This long-term is designed to provide the first systematic prospective data collection for a cohort of severely obese adolescents over a 5+ year period.

**Pediatric Surgery » Jason S. Frischer, MD**

We studied the outcome of multi-run ECMO.

**Pharmacy; Center for Acute Nephrology » Alexander A. Vinks, PharmD, PhD, FCP and Stuart Goldstein, MD**

Studying the effect of AKI on milrinone pharmacokinetics.

**Pulmonary Medicine » Raouf S. Amin, MD**

Studying arterial structure function in sleep apnea.

**Pulmonary Medicine » Hemant Sawnani, MD**

This collaboration focuses on the development of an integrated neuromuscular program as well as clinical research activities characterizing cardio-pulmonary interactions in DMD.

**Sports Medicine » Nicholas M. Edwards, MD, MPH**

Studying physical activity and cardiovascular risk factors in youth.

**Grants, Contracts, and Industry Agreements****Grant and Contract Awards****Annual Direct****CNOTA, J / KRAWCZESKI, C****Pediatric Heart Network Prairieland Consortium**

National Institutes of Health

U10 HL 109673                    09/01/11-06/30/16                    \$367,500

**The Relationship of Family Factors to Developmental and Psychosocial Outcomes in Children with Hypoplastic Left Heart Syndrome**

National Institutes of Health(Children's Hospital of Wisconsin)

U01 HL 068270                    01/09/12-01/08/14                    \$1,200

**Trial of Beta Blocker vs Angiotensin II Receptor Blocker Therapy in Individuals with Marfan Syndrome**

National Institutes of Health(New England Research Institutes)

U01 HL 068270                    05/05/11-12/31/14                    \$1,570

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

National Institutes of Health

K23 HL 091174                    09/01/08-07/31/13                    \$124,500

**JEFFERIES, J****Heart Failure Pediatric Cardiology Fellowship Program**

Medtronic, Inc.

07/01/12-06/30/12                    \$15,000

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

National Institutes of Health(Children's Mercy Hospital)

U01 DK 066143                    08/01/08-07/31/13                    \$60,996

**MARINO, B****Transitional Telehealth Homecare: REACH**

National Institutes of Health(Children's Hospital of Philadelphia)

R01 NR 002093                    09/21/11-06/30/16                    \$86,360

**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)

R01 HL 098634

05/15/11-12/31/14

\$34,672

**MOORE, V****Quantitative Non-Invasive Assessment of Right Ventricular Function Using Global Longitudinal Strain and TAPSE in a Pre-Clinical Setting**

American Society of Echocardiography

06/01/13-05/31/14

\$22,727

**SIEGEL, R****The Health Effects of a Blueberry Enriched Diet on Obese Children: A Feasibility Study**

Wild Blueberry Association of America

WBANA-Siegel

11/01/12-10/31/13

\$30,000

**TOWBIN, J****Biomarkers in Pediatric Cardiomyopathy**

National Institutes of Health(University of Miami)

R01 HL 109090

08/06/12-07/31/16

\$34,637

**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

\$339,301

**Current Year Direct      \$1,135,130****Industry Contracts****BEEKMAN, R**

The Johns Hopkins University

\$1,186

**CHIN, C**

Roche Laboratories, Inc

\$24,623

**HIRSCH, R**

AGA Medical, LLC

\$6,427

**Current Year Direct Receipts      \$32,236****Total      \$1,167,366**