

# Division of Cardiothoracic Surgery

| DIVISION PROFILE                              |          |
|---|----------|
| Number of Faculty                             | 4        |
| Number of Fellows                             |          |
| Research Fellows                              | 1        |
| Number of Other Students (full and part-time) | 5        |
| Number of Support Personnel                   | 13       |
| Annual Total Grant Support (direct)           | \$90,000 |
| Number of Peer Reviewed Publications          | 22       |
| Patient Encounters                            |          |
| Outpatient                                    | 369      |
| Inpatient                                     | 416      |

## FACULTY LISTING

**Peter B. Manning, MD**, Associate Professor of Clinical Surgery, Director, Division of Cardiothoracic Surgery; Co-Director, The Heart Center

**Jodie Y. Duffy, PhD**, Research Assistant Professor

**Piروز Eghtesady, MD, PhD**, Assistant Professor of Clinical Surgery

**Jeffrey M. Pearl, MD**, Associate Professor of Clinical Surgery, Surgical Director, Cardiac Transplantation

## OVERVIEW

The Division of Cardiothoracic Surgery at Cincinnati Children's Hospital Medical Center is comprised of three surgical faculty, one research faculty, four clinical perfusionists, three nurse practitioners, one physician assistant, and three administrative support staff dedicated to the surgical care of children with cardiac problems. Based completely at Cincinnati Children's Hospital Medical Center, the division has formed a strong collaborative relationship over recent years with the leadership in Cardiothoracic Surgery at University Hospital. As an integrated component of The Heart Center, a multi-disciplinary business unit within CCHMC, the division has enjoyed a continually higher profile nationally as a leader in the management of cardiac problems in children.



*Left to Right: J. Duffy, P. Manning, P. Eghtesady, J. Pearl*

The vision of the division is to be a national and international leader in pediatric cardiothoracic surgical care, surgical research and teaching. The clinical programs of the division continue to provide excellent care with morbidity and mortality rates rivaling any program nationwide.

Members of the Division of Cardiothoracic Surgery function as key faculty of the Pediatric Cardiology and Pediatric Critical Care fellowship training programs at CCHMC. Close interaction with these fellows occurs on a daily basis, primarily in the Cardiac Intensive Care Unit, in addition to a number of weekly teaching conferences in which the faculty participates. The division has been involved in the submission of a successful application for a Cardiothoracic Residency training program based at University Hospital. The

division will serve as one of the primary rotations of the Cardiothoracic Surgery training program with a Fellow on the CCHMC service four to six months out of each year.

The research efforts within the division continue to grow with two basic science laboratories presently within the division, as well as the collaboration of Cardiothoracic Surgical faculty with Cardiology and other faculty on a number of clinical research projects.

## HIGHLIGHTS

The clinical programs in the Division of Pediatric Cardiothoracic Surgery focus on surgical management of cardiac problems from birth through adolescence. We also have become more involved in the Fetal Cardiology program, participating in prenatal counseling of families with children with congenital heart defects. We focus on complete corrections of cardiac defects in the newborn period, management of complex single ventricle cardiac anomalies, and techniques to limit transfusion exposures. The program has the capability of performing all levels of open and closed heart surgeries, including cardiac transplantation and the ability to perform ECMO support.

Clinical case volume for fiscal 2004 was stable from the prior year. The annual review of state wide data for pediatric cardiac programs under the auspices of BCMH revealed that Cincinnati Children's had the highest volume of pediatric cardiac surgical cases of any program in the state last year. The Heart Center's website underwent major reorganization to improve the distribution of the capabilities offered at The Heart Center. The Heart Center Encyclopedia, which has received over 15,000 hits per month, is in the process of being reviewed and updated at the present time. Renovations to the Intensive Care pods in Location B were completed allowing the Cardiac Intensive Care Unit to occupy 400 and 500 pods expanding our intensive care capacity from 10 beds to 15.

Research has continued to be active in the Division of Cardiothoracic Surgery. Dr. Pearl's lab continues its studies of hypoxia/reoxygenation injury. An RO1 grant application was submitted to the NIH, scored well, but was not funded. It is in the process of resubmission. Dr. Eghtesady has successfully established a research laboratory focusing on the creation and ultimate treatment of hypoplastic left heart syndrome in fetal sheep model. He has performed over 50 fetal animal experiments to date and received a young investigator award by the section on cardiology and cardiac surgery at the annual American Academy of Pediatrics meeting. The Division continues to collaborate on a number of clinical research projects with other members of The Heart Center, including cardiologists, intensivists, and anesthesiologists. The projects vary from heterogeneity catecholamine in patients undergoing cardiac repairs to a project analyzing different schedules for all pain medicines to maximize patient comfort after cardiac surgery, and studies to evaluate novel approaches to assess renal function following cardiac surgery.

## TRAINING

Jefferson Lyons, MD

PGY-III University of Cincinnati

## GRANTS, CONTRACTS AND INDUSTRY AGREEMENTS

### Grant and Contract Awards

### Annual Direct/Project Period Direct

Pearl, J

#### **Alleviation of Reperfusion-Mediated Cardiac Dysfunction**

National Institutes of Health

R03 HD 046896

03/01/04 – 02/28/06

\$50,000/\$100,000

Duffy, J

#### **Calpain/Calpastatin Regulation of Reoxygenation Injury**

American Heart Association – Ohio Valley Affiliate

07/01/03 – 06/30/05

\$40,000/\$80,000

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|                            |                 |
|----------------------------|-----------------|
| <b>Current Year Direct</b> | <b>\$90,000</b> |
|----------------------------|-----------------|

## **Industry Contracts**

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|                                     |            |
|-------------------------------------|------------|
| <b>Current Year Direct Receipts</b> | <b>\$0</b> |
|-------------------------------------|------------|

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|              |                 |
|--------------|-----------------|
| <b>TOTAL</b> | <b>\$90,000</b> |
|--------------|-----------------|

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## **PUBLICATIONS**

1. **Duffy JY**, Overmann GJ, Keen CL, Clegg MS, Daston GP. Cardiac abnormalities induced by zinc deficiency are associated with alterations in the expression of genes regulated by the zinc-finger transcription factor GATA-4. *Birth Defects Res Part B Dev Reprod Toxicol* 2004;71(2):102-9.
2. **Duffy JY**, Nelson DP, Schwartz SM, Wagner CJ, Bauer SM, Lyons JM, McNamara JL, **Pearl JM**. Glucocorticoids reduce cardiac dysfunction after cardiopulmonary bypass and circulatory arrest in neonatal piglets. *Pediatr Crit Care Med* 2004;5(1):28-34.
3. Lyons JM, **Duffy JY**, **Manning PB**, **Pearl JM**. Compression of an extracardiac fontan following classic fontan revision. *J Card Surg* 2004;19(3):254-7.
4. Schwartz SM, **Duffy JY**, **Pearl JM**, Goins S, Wagner CJ, Nelson DP. Glucocorticoids preserve calpastatin and troponin I during cardiopulmonary bypass in immature pigs. *Pediatr Res* 2003;54(1):91-7.
5. Ashburn DA, Blackstone EH, Wells WJ, Jonas RA, Pigula FA, **Manning PB**, Lofland GK, Williams WG, McCrindle BW. Determinants of mortality and type of repair in neonates with pulmonary atresia and intact ventricular septum. *J Thorac Cardiovasc Surg* 2004;127(4):1000-7; discussion 1007-8.
6. Border WL, Syed AU, Michelfelder EC, Khoury P, Uzark KC, **Manning PB**, **Pearl JM**. Impaired systemic ventricular relaxation affects postoperative short-term outcome in Fontan patients. *J Thorac Cardiovasc Surg* 2003;126(6):1760-4.
7. George JC, Shim D, Bucuvalas JC, Immerman E, **Manning PB**, **Pearl JM**, Beekman RH, 3rd. Cost-effectiveness of coarctation repair strategies: endovascular stenting versus surgery. *Pediatr Cardiol* 2003;24(6):544-7.
8. **Pearl JM**. Right ventricular-pulmonary artery connection in stage 1 palliation of hypoplastic left heart syndrome. *J Thorac Cardiovasc Surg* 2003;126(5):1268-70.
9. **Pearl JM**, **Manning PB**, Franklin C, Beekman R, Cripe L. Risk of recoarctation should not be a deciding factor in the timing of coarctation repair. *Am J Cardiol* 2004;93(6):803-5.
10. **Pearl JM**, Schwartz SM, Nelson DP, Wagner CJ, Lyons JM, Bauer SM, **Duffy JY**. Preoperative glucocorticoids decrease pulmonary hypertension in piglets after cardiopulmonary bypass and circulatory arrest. *Ann Thorac Surg* 2004;77(3):994-1000.
11. Schroeder VA, **Pearl JM**, Beekman RH, Cripe L, Khoury P, **Manning PB**, Nelson DP. Usefulness of the mitral valve Z score in predicting the need to close moderate- to large-sized atrial septal defects in infants with aortic coarctation. *Am J Cardiol* 2003;92(4):480-3.
12. **Duffy JY**, Overmann GJ, Keen CL, Clegg MS, Daston GP. Cardiac abnormalities induced by zinc deficiency are associated with alterations in the expression of genes regulated by the zinc-finger transcription factor GATA-4. *Birth Defects Res Part B Dev Reprod Toxicol* 2004;71(2):102-9.
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15. Schwartz SM, **Duffy JY**, **Pearl JM**, Goins S, Wagner CJ, Nelson DP. Glucocorticoids preserve calpastatin and troponin I during cardiopulmonary bypass in immature pigs. *Pediatr Res* 2003;54(1):91-7.

16. Ashburn DA, Blackstone EH, Wells WJ, Jonas RA, Pigula FA, **Manning PB**, Lofland GK, Williams WG, McCrindle BW. Determinants of mortality and type of repair in neonates with pulmonary atresia and intact ventricular septum. *J Thorac Cardiovasc Surg* 2004;127(4):1000-7; discussion 1007-8.
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18. George JC, Shim D, Bucuvalas JC, Immerman E, **Manning PB**, **Pearl JM**, Beekman RH, 3rd. Cost-effectiveness of coarctation repair strategies: endovascular stenting versus surgery. *Pediatr Cardiol* 2003;24(6):544-7.
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21. **Pearl JM**, Schwartz SM, Nelson DP, Wagner CJ, Lyons JM, Bauer SM, **Duffy JY**. Preoperative glucocorticoids decrease pulmonary hypertension in piglets after cardiopulmonary bypass and circulatory arrest. *Ann Thorac Surg* 2004;77(3):994-1000.
22. Schroeder VA, **Pearl JM**, Beekman RH, Cripe L, Khoury P, **Manning PB**, Nelson DP. Usefulness of the mitral valve Z score in predicting the need to close moderate- to large-sized atrial septal defects in infants with aortic coarctation. *Am J Cardiol* 2003;92(4):480-3.