

**Adult Congenital Heart Disease Fellowship Program**

**Clinical Fellowship**

**For Adult Cardiologists**

**MAUDE Unit**

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**McGill University**

**Montreal Children's Hospital**

**Montreal General Hospital**

**Royal Victoria Hospital**

**Sir Mortimer B Davis Jewish General Hospital**

**Montreal, Quebec**

**Canada**

**Number of Positions: Maximum 2 per year**

**Fellowship Program Director: Dr. Judith Therrien**

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## **Introduction**

The MAUDE (McGill Adult Unit for congenital heart Disease Excellence) (Montreal Children's Hospital (MCH), Montreal General Hospital (MGH), Royal Victoria Hospital (RVH) and the Sir Mortimer B Davis Jewish General Hospital (JGH)) Cardiology Division, McGill University offer a 1 year or 2 year Fellowship program for Adult Cardiologists who desire to obtain Level 2 or 3 training (see reference 1) in adult congenital heart disease (ACHD).

## **Requirements**

- 1) Completion or anticipated completion of a clinical adult cardiology residency program (Royal College, College des Medecins, or equivalent)
- 2) Complete C.V. submission
- 3) Three reference letters from Cardiologists
- 4) All candidates will be interviewed by the ACHD Training Program Director and staff (see below) and will be discussed for consideration.
- 5) Application will be via Minerva system and accredited through the McGill Cardiology Training Program and its Program Director.

## **Program Description**

The ACHD Fellowship program should provide the Fellow with necessary knowledge in:

- 1) ACHD anatomy, physiology, clinical presentation and natural history of specific lesions
- 2) Diagnostic methods such as physical examination, electrocardiography, chest roentgenogram, echocardiography (both transthoracic and transesophageal), catheterization, angiography, cardiac MRI and cardiac CT
- 3) Therapeutic methods such as pharmacological treatment, catheter interventional procedures and surgical procedures
- 4) Residua and sequela of surgical and catheter interventions
- 5) Reproduction issues such as contraception, counseling for pregnancy as well as management during pregnancy and delivery
- 6) Evaluation for non cardiac surgery
- 7) Management of pulmonary vascular obstructive disease
- 8) Employment and leisure activities counseling
- 9) Insurability, socioeconomic and psychological issues

Below is the weekly schedule containing all the cardiac congenital activities ongoing at the MAUDE Unit.

The 1 year Fellowship will permit the candidate to achieve Level 2 training competence

|        | Monday                                     | Tuesday   | Wednesday                      | Thursday  | Friday            |
|--------|--|---|--------------------------------|---|-------------------|
| am RVH | Interventional Catheterization<br>+<br>TEE | Congenital Clinic<br>+<br>Echo                      | Congenital Clinic<br>+<br>Echo | Congenital Clinic<br>+<br>Echo                      | Research          |
| am JGH | Pulmonary Hypertension Clinic              |   |                                |   | Congenital clinic |
| am MCH |  | Pediatric Catheterization<br>+<br>Pediatric Surgery | Pediatric MRI                  | Pediatric Catheterization<br>+<br>Pediatric Surgery |                   |
| Noon   | ACHD Surgical Conference                   |   |                                |   |                   |
| pm RVH |  | Congenital Clinic<br>+<br>Echo                      | Congenital Clinic<br>+<br>Echo | Congenital Clinic<br>+<br>Echo                      | Research Meeting  |
| pm MCH | Pediatric Surgical Conference              | Pediatric Catheterization<br>+<br>Pediatric Surgery | ACHD MRI                       | Pediatric Catheterization<br>+<br>Pediatric Surgery |                   |

in ACHD and the 2 year Fellowship program will permit the candidate to achieve Level 3 training competence in ACHD (1).

More specifically, during the 1 year ACHD Fellowship Program, the trainee will be required to participate in:

- 1) Four to six outpatient clinic per week organized for the care of ACHD
- 2) Two to four outpatient echocardiography clinic per week organized for the care of ACHD
- 3) 1 MRI clinic per week organized for the care of ACHD
- 4) 1 cardiac catheterization session per week

- 5) Option to observe in the operating room during CHD surgery and assist with intraoperative TEE
- 6) Option to participate in 1 clinic of pulmonary hypertension per week
- 7) 1 cardiac pediatric/surgical conference per week
- 8) 1 ACHD/surgical conference per week
- 9) 1 research meeting per week
- 10) 1 monthly electrophysiology clinic organized for the care of ACHD

In addition to the aforementioned requirements and activities for level 2, level 3 training Fellows will need to have performed at least:

- 1) 40 diagnostic cardiac catheterization in CHD (140 are done yearly)
- 2) 300 transthoracic echocardiograms (inpatients or outpatient) (683 done yearly)
- 3) 50 transesophageal echocardiograms (intraoperative or outpatient) (100 done yearly)
- 4) Be able to interpret advanced imaging techniques such as MRI and CT scan (over 50 done yearly)
- 5) Be involved in and complete at least 2 ACHD research projects (see research below) leading to 2 manuscripts publication in cardiology leading journals.

## **Faculty**

### **Core**

Dr. Ariane Marelli MD, FRCPC  
 Associate Professor, Division of Cardiology - MUHC  
 Director of the MAUDE Unit, McGill University  
 ACHD Fellowship: University of California, Los Angeles, USA

Dr. Judith Therrien MD, FRCPC  
 Associate Professor, Division of Cardiology – JGH and MUHC  
 Director of the Fellowship Program, MAUDE Unit, Mc Gill University  
 ACHD Fellowship: Royal Brompton Hospital, London, England  
 Toronto General Hospital, Ontario, Canada  
 Chair: Canadian Guidelines on Management of Adults with Congenital Heart Disease

Dr. Giuseppe Martucci MD, FRCPC  
 Assistant Professor, Division of Cardiology – MUHC  
 Director of interventional ACHD catheterization  
 ACHD Fellowship: Boston Children’s Hospital, Harvard Medical School, Boston, USA

Natalie Bottega MD, FRCPC  
 Assistant Professor, Division of Cardiology – MUHC  
 Director of ACHD and Pregnancy clinic  
 ACHD Fellowship: Mayo Clinic, Minnesota, USA  
 Toronto General Hospital, Ontario, Canada

Renee Schiff, MD, FRCPC  
Assistant Professor, Division of Cardiology – MUHC  
ACHD Fellowship: Royal Brompton Hospital, London UK

Christo Tchervenkov MD, FRCSC  
Professor of Medicine, Division of Cardiac Surgery – MUHC  
Director of the Congenital Heart Disease Center of Excellence  
Surgical Fellowship: Boston Children’s Hospital, Harvard Medical School, Boston, USA  
Chair: President of the Children’s World Society

Pierre Luc Bernier  
Assistant Professor of Medicine, Division of Cardiac Surgery – MUHC  
Surgical Fellowship: Children’s Philadelphia  
Columbia, New York

### **Support**

Luc Jutras MD, FRCPC  
Assistant Professor of Medicine, Division of Pediatric Cardiology – MUHC  
Director of non-invasive Laboratory, Montreal Children Hospital  
Pediatric Fellowship: San Francisco, USA

Adrian Dancea MD, FRCPC  
Assistant Professor of Medicine, Division of Pediatric Cardiology – MUHC  
Director of the Pediatric Catheterization Laboratory, Montreal Children Hospital  
Pediatric Fellowship:

David Langleben MD, FRCPC  
Professor of Medicine, Division of Cardiology – JGH  
Director of the Center for Pulmonary Vascular Disease, JGH  
Fellowship: Boston, USA

Nadia Giannetti MD, FRCPC  
Assistant Professor of Medicine, Division of Cardiology – RVH  
Director of Heart Failure Clinic  
Fellowship: Stanford, California, USA

Renzo Cecere MD, FRCSC  
Assistant Professor of Medicine, Division of Cardiac Surgery - RVH  
Director of high risk Surgery  
Fellowship: Stanford, California, USA

### **Facilities**

## **Royal Victoria Hospital**

### MAUDE Unit

The MAUDE Unit located at the Glenn site is a 177 meter squared unit with 3 examining rooms each equipped with a computer, 1 conference room equipped with a computer, review station and projector and 1 echo room with a Vivid 7 GE echo machine and a viewing station. There are 2 dedicated secretaries, 1 full time clinician nurse, 3 biostatisticians, 1 dedicated echo sonographer attached to the MAUDE Unit. Fellows have their dedicated room, desk and own computer. A computerized clinical data base as well as complete report system renders the clinic paperless and provides for a very efficient flow. The MAUDE Unit sees about 1000 outpatients per year (see Appendix 2), the majority of the cases coming from the Montreal Children Hospital. The MAUDE Unit performs over 500 transthoracic echos per year. Access to transesophageal echo, stress and dobutamine echo is provided by the core RVH echo lab (see below). Weekly surgical and research meetings as well as monthly teaching sessions are held in the conference room.

### Echocardiography Laboratory

The echo lab at the RVH is a state of the art laboratory with 5 Vivid 7 GE machines situated down the corridor from the MAUDE Unit. Their annual volume totals about 5000 procedures per year. ACHD transesophageal echo, stress and dobutamine echos are performed in the core RVH echo lab.

### Cardiac Catheterization Laboratory

The catheterization lab is a biplane laboratory dedicated to the care of ACHD. Diagnostic as well as interventional procedures such as percutaneous valves and occlusion devices are performed on a weekly basis for a total of about 100 per year (see Appendix 2). The cardiac cath lab also has a dedicated echocardiography machine for TEE procedure peri catheterization intervention.

### Surgical Operating Room

About 50 open-heart ACHD surgeries are performed on an annual basis. Left and right ventricular assist devices as well as in house transplant expertise are available for high-risk surgeries.

## **Montreal Children Hospital**

### Magnetic Resonance

State of the art MRI facilities and expertise is provided at the MCH. Over 60 cases per year are being performed.

### Cardiac catheterization Laboratory

Pediatric cardiac catheterization are performed twice a week at the MCH in a state of the art biplane laboratory.

### Surgical Operating Room

Four cases of pediatric cardiac surgery are performed at the MCH on a weekly basis. Cases are referred from throughout Canada.

## **Jewish General Hospital**

### Beth Raby Ambulatory Clinic

This outpatient clinic sees about 250 patients per year. Cases differ from the RVH outpatient clinic in that the patients are most often only recently diagnosed and unrepaired.

### Echocardiography Laboratory

The echocardiography Laboratory at the JGH performs over 5000 studies per year. Access to 3D echocardiography can be used for clinical or research purposes.

### Center for Pulmonary Vascular Disease

The Pulmonary Hypertension Center at the JGH is the largest in Quebec with over 700 patients being followed. All our ACHD patients with pulmonary hypertension are followed and treated co jointly with the Center.

## **Fellows Duties and Responsibilities**

**On call:** The Fellow(s) will be responsible to round every week days on all the ACHD patients hospitalized (for medical treatment, surgical or catheter procedure) and report to the ACHD staff on duty. Weekend calls will be covered on a rotatory basis.

**Teaching:** The ACHD Fellow will be responsible for providing bed side teaching once a week to the in house staff looking after the in patients (e.g. CCU team looking after a patient hospitalized in CCU). As well, they will contribute to a series of didactic teaching given once a month to the cardiology residents completing their congenital 2 months' rotation. Fellows will be required to participate in the academic half day teaching to core cardiology residents on the subject of ACHD (2 half days per year minimum) as well as present once a year at Cardiology Grand Rounds.

**Research** (see Appendix 1).

### Epidemiology

The MAUDE Unit owns the ACHD Quebec wide administrative database from 1983 to 2005 which contains 40 000 adult patients with congenital heart disease. Two biostatisticians and one PhD epidemiology student work on this database. Various manuscripts emanating from the database have already been published or presented as abstracts to international cardiology conferences

### Right sided Heart Function

Non invasive quantitative assessment of right ventricular function, shedding light into right ventricular adaptation process to volume and pressure loading conditions, helping us

determine the best timing for procedures on the right heart is also a focus of research at the MAUDE Unit, using echocardiography and MRI as quantitative tools.

### Pulmonary Hypertension

Basic research as well as pharmacological randomized trials of patients with pulmonary hypertension is ongoing at the Center for Pulmonary Vascular Disease, JGH. This center is also one of the only 2 Canadian centers to perform stem cell research and transplant in patients with pulmonary hypertension.

### Pregnancy

The high-risk maternal cardiac clinics affiliated with high risk obstetrics at the RVH and JGH will provide a background upon which clinical research can be undertaken looking at immediate outcome of patients with ACHD and pregnancies as well as long term outcome.

### Genetic

The genetics of ACHD is an exploding field and plans are in place to start collecting blood in all our ACHD patients to be able to examine kindred's of patients with ACHD, more particularly patients with bicuspid aortic valves. This ACHD genetic blood database will be used for local as well as international collaborative research efforts.

## **Evaluation**

The Fellows will be evaluated on a regular basis by all ACHD staff members. Verbal feedback will be given monthly by the Director of the ACHD Fellowship Program with written feedback a minimum of twice per year. Written evaluations will be done using the standard McGill evaluation format as well as Can Meds format as applicable.

Fellow will be encouraged to feedback to the program director about all issues that concern him/her and that impact on learning. A McGill Resident Feedback form will be given to the Fellow to submit to the Fellowship Director, who will consider the comments and make changes to the Fellowship program as needed to best suit the needs of the Fellow. In addition, the Fellow will complete a report at the end of the Fellowship, to be submitted to the Cardiology Program Director for McGill University.

## **Funding**

The Beth Raby Fellowship endowment at the Jewish General Hospital provides ACHD fellows with an annual 45 000 \$ Canadian bursary allotted on the basis of need and merit.

For information regarding salary amount and acceptable sources of funding please visit the link at [http://www.medicine.mcgill.ca/postgrad/admission\\_fellowships.htm](http://www.medicine.mcgill.ca/postgrad/admission_fellowships.htm)

## **Conclusion**



McGill offers a 1 or 2 year postgraduate “hands on” fellowship program with expert faculty in ACHD, state of the art facilities, as well as cutting edge research opportunities to any graduate adult cardiologists who wish to make ACHD the focus of their academic career.

## **Reference**

1. Child JS, Freed MD, Mavroudis C, Moodie DS, Tucker AL. Task force 9: Training in the care of adult patients with congenital heart disease. *J Am Coll Cardiol* 2008;51:389-94.

## **Appendix 1.**

### **Medical Publications 2001-2007**

Khairy P, Marelli AJ: Clinical Utility of Electrocardiography in Adults with Congenital Heart Disease. *Circulation* 2007;116:2734-2746

Schwerzmann M, Samman AM, Salehian O, Holm J, Merchant N, Webb G, Therrien J, Sui SC, Silversides CK. Echocardiographic Assessment of Right Ventricular Function in Adults with Repaired Tetralogy of Fallot. *Am J Cardiol* 2007;99:1593-7.

Alanbaei M, Jutras L, Therrien J, Marelli A. Iatrogenic cyanosis and clubbing: 25 years of chronic hypoxemia after the repair of an atrial septal defect. *Can J Cardiol* 2007;23:901-3.

Ahmed S, Therrien J. Clinical course and echocardiographic predictors of aortic valve replacement in patients with bicuspid aortic valve. *Journal of Am Soc Echo* 2007;20:998-1003.

Tsang W, Bengt J, Salehian O, Holm J, Webb G, Therrien J. Intracardiac Thrombus in Adults with Fontan Operation: Treatment and Clinical Outcome. *Cardiology in the Young*, 2007; 17: 646-651.

Marelli AJ: Congenital heart disease in adults. In: Goldman L, Bennett eds, Cecil textbook of Medicine, 23<sup>rd</sup> edition. Philadelphia: W.B. Saunders Company. 2007; 459-472.

Redington A, Smallhorn J, Therrien J, Webb GD, Chap. 61 Congenital Heart Disease, Braunwald, 8<sup>th</sup> Ed. 2007.

Marelli AJ, Mackie AS, Ionescu-Ittu R, Rahme E, Pilote L. Congenital Heart Disease in the General Population. Changing Prevalence and Age Distribution. *Circulation* 2007; 115: 163-172.

Mackie AS, Pilote L, Ionescu-Ittu R, Rahme E, Marelli AJ. Healthcare Resource Utilization in Adults with Congenital Heart Disease: a Population-Based Study. *American Journal of Cardiology* 2007; 33:839-843.

Dipchand A, Cecere R, Delgado D, Dore A, Giannetti N, Haddad H, Howlett J, Leblanc MH, Leduc L, Marelli A, Perron J, Poirier N, Ross H. Canadian Consensus on cardioac transplantation in pediatric and adult congenital heart disease patients 2004: Executive summary. *Can J of Cardiol* 2005; 21: 1145-1148.

Gatzoulis MA, Swan L, Therrien J, Pantely GA. *Adult Congenital Heart Disease: A Practical Guide*. BMJ. Ed. Blackwell, 2005.

Therrien J, Provost Y, Colman J, Webb GD. Normalization of Right Ventricular Volumes Following Pulmonary Valve Replacement in Adults After Repair of Tetralogy of Fallot: an MRI study. *Am J Cardiol* 2005;95:779-782.

Salehian O, Horlick E, Schwerzmann M, Haberer K, McLaughlin P, Siu SC, Webb G, Therrien J. Improvements in Cardiac Form and Function Following Transcatheter Closure of Secundum Atrial Septal Defects. *J Am Coll Cardiol* 2005;45:499-504.

Redington A, Smallhorn J, Therrien J, Webb GD, Chap 44 *Congenital Heart Disease*, Braunwald, 7th Ed. 2004.

Benzaquen BS, Webb GD, Colman JM, Williams WG, Therrien J. Arterial Switch Operation After Mustard Procedures in Adult Patients with Transposition of the Great Arteries: Is it Time to Revise our Strategy? *Am Heart J* **2004**;147(3):E8.

Salehian O, Schwerzmann M, Merchant N, Webb GD, Siu SC, Therrien J. Assessment of systemic right ventricular function in patients with transposition of the great arteries using myocardial performance index: comparison with cardiac magnetic resonance imaging. *Circulation* **2004**;110:329-33.

Marelli AJ: Congenital heart disease in adults. In: Goldman L, Bennett eds, *Cecil Textbook of Medicine*, 22nd edition. Philadelphia: W.B. Saunders Company. **2003**; 371-383.

Therrien J. Chapter 5 *Echocardiography, Diagnosis and Management of Adult Congenital Heart Disease*, 1st Ed. **2003**.

Therrien J, Morton P, Walker M, Grant J, Webb G. Controlled Trial of Exercise Rehabilitation in Patients with Tetralogy of Fallot Repair. *Can J Cardiol* 2003;19:685-89.

Varma C, Warr MR, Hendler AL, Narinder P, Webb GD, Therrien J. Prevalence of Silent Pulmonary Emboli in Adults after the Fontan Operation. *J Am Coll Cardio* **2003**;41:2252-2258.

Silversides C, Veldtman G, Crossin J, Webb G, McCrindle B, Siu S, Therrien J. Pressure Half Time Correlates with Severity of Pulmonary Regurgitation in Adults with Repaired Tetralogy of Fallot. *J Am Soc Echocardiogr* **2003**;16:1057-62.

Silverside C, Granton J, Hart M, Webb G, Therrien J. Pulmonary Thromboembolic Disease in Adults with Eisenmenger Syndrome. *J Am Coll Cardiol* **2003**;42:1982-7.

Therrien J, Webb G. Clinical update on adults with congenital heart disease. *The Lancet* **2003**;362: 1305-13.

Marelli AJ, Moodie, DS: Adult congenital heart disease. In: Topol E Ed, *Textbook of Cardiovascular Medicine* 2nd edition. Philadelphia: Lippincott – Raven , **2002**: 709-731.

Therrien J, Gatzoulis MA, Marx GR. Late Problems in Tetralogy of Fallot-Recognition, Management, and Prevention. *Cardiology Clinics* **2002**;20:395-404.

Malik P, Therrien J, Webb GD. Acute Myocardial Infarction Late After Mustard Procedure for Dextro-Transposition of the Great Arteries: Preventable with Long Term Systemic Anticoagulation? *Can J Cardiol* **2002**;18:187-91.

Ghai A, Siu S, Harris L, Webb G, Therrien J. Left Ventricular Dysfunction is a risk factor for sudden death in adults with repaired tetralogy of Fallot. *J Am Coll Cardiol* **2002**;40:1675-80.

Therrien J, Warnes C, Daliento L, Hess J, Hoffman A, Marelli AJ, Thilen U, Presbitero P, Perloff J, Somerville J, Webb GD. Canadian Cardiovascular Society Consensus Conference 2001 update: recommendations for the management of adults with congenital heart disease part III. *Can J of Cardiol*, **2001**; 17: 1135-58.

Therrien J, Dore A, Gersony W, Iserin L, Liberthson R, Meijboom F, Colman JM, Oeschlin E, Taylor D, Perloff J, Somerville J. Canadian Cardiovascular Society Consensus Conference 2001 update: recommendations for the management of adults with congenital heart disease. Marelli A, primary panelist: part I. *Can J of Cardiol*, **2001**; 17:940-59.

Therrien J, Gatzoulis M, Graham T, Bink-Boekkens M, Connelly M, Niwa K, Mulder B, Pyeritz R, Perloff J, Somerville J, Webb GD. Canadian Cardiovascular Society Consensus Conference 2001 update: recommendations for the management of adults with congenital heart disease. Marelli A, primary panelist: part II. *Can J of Cardiol* **2001**; 17: 1029-50.

32nd Bethesda Conference: Care of the Adult With Congenital Heart Disease, October 2-3, 2000. Marelli A, *J Am Coll Cardiol*, **2001**;37:1161-1198.

Therrien J, Warnes C, Daliento L, Hess J, Hoffman A, Marelli AJ, Thilen U, Prebitero P, Perloff J, Somerville J, Webb GD. Canadian Cardiovascular Society Consensus Conference 2001 update: recommendations for the management of adults with congenital heart disease part III. *Can J of Cardiol*, **2001**; 17:1135-58.

Fredriksen PM, Therrien J, Veldtman G, Warsi MA, Liu P, Siu S, Williams We, Granton J, Webb G. Lung function and aerobic capacity in adult patients following modified Fontan procedure. *Heart* **2001**;85:295-9.

Fredrikson PM, Chen A, Hechter S, Veldtman G, Therrien J, Webb G. Exercise Capacity in Adult Patients with Congenitally-Corrected Transposition of the Great Arteries. *Heart* **2001**;85:191-5.

Therrien J, Siu S, Gatzoulis M. Impact of Pulmonary Valve Replacement on Arrhythmia Propensity Late after Repair of Tetralogy of Fallot. *Circulation* **2001**;103:2489-94.

Hechter SJ, Fredriksen PM, Merchant N, Veldtman G, Straatman L, Therrien J, Warsi MA, Siu S, Benson L, Liu P, Webb G. Angiotensin-Converting Enzyme Inhibitors in Adults with The Mustard Procedure. *Am J Cardiol* **2001**;87:660-3.

Fredriksen PM, Therrien J, Veldtman G, Warsi MA, Liu, Webb G. Lung function and aerobic capacity in adult with various congenital heart diseases. *Am J Cardiol* **2001**;87:310-4.

Sebbag I, Rudski L, Therrien J, Hirsch A, Langleben D. Effect of Chronic Infusion of Epoprostenol on the Echocardiographic Right Ventricular Myocardial Performance Index and its Relation to Clinical Outcome I Patients with Primary Pulmonary Hypertension. *Am J Cardiol* **2001**;88:1060-3.

Therrien J, Webb GD, Chapter 44. Adult Congenital Heart Disease, Braunwald, 6th Ed. **2001**.

Therrien J, Dore A, Gersony W, Iserin L, Liberthson R, Meijboom F, Coman JM, Oechsoin E, Taylor D, Perloff J, Somerville J, Webb GD. Canadian Cardiovascular Society. CCS Consensus Conference 2001 update: recommendations for the management of adults with congenital heart disease. Part I. *Can J Cardiol* **2001**;17:940-59.

Therrien J, Gatzoulis M, Graham T, Bink-Boelkens J, Connelly M, Niwa D, Mulder B, Pyeritz R, Perloff J, Somerville J, Webb GD. Canadian Cardiovascular Society. CCS Consensus Conference 2001 update: recommendations for the management of adults with congenital heart disease. Part II. *Can J Cardiol* **2001**;18:1029-1050.

Marelli AJ: Congenital heart disease in adults. In: Goldman L, Bennett eds, Cecil Textbook of Medicine, 21st edition. Philadelphia: W.B. Saunders Company. **2000**: 370-383.

### **Surgical Publications 2001-2007**

Chu, MW, Sharma K, **Tchervenkov CJ**, Jutras LF, Lavoie J, Shemie SD, Laliberte E, Calaritis C, Cecere R. Berlin Heart ventricular assist device in a child with hypoplastic left heart syndrome. *Ann Thorac Surg* **2007**; 83:1179-81.

Chu MW, Jutras LF, **Tchervenkov CI**. Neonatal repair of right interrupted aortic arch, aberrant left subclavian artery, ventricular septal defect and retroaortic innominate vein. *Eur J Cardiothorac Surg* **2007**;31:555-7.

Jacobs ML, Mavroudis C, Jacobs JP, **Tchervenkov CI**, Pelletier GJ. Report of the 2005 STS Congenital Heart Surgery Practice and Manpower Survey. *Ann Thorac Surg* **2006**;82:1152-8.

**Tchervenkov CI** , Jacobs JP, Weinberg PM, Aiello VD, Beland MJ, Colan SD, Elliott MJ, Franklin RC, Gaynor JW, Krogmann ON, Kurosawa H, Maruszewski B, Stellin G. The nomenclature, definition and classification of hypoplastic left heart syndrome. *Cardiol Young* **2006**;16:339-68.

Chu MW, Sharma K, **Tchervenkov CI**, Jutras LF. Complete repair of concomitant interrupted aortic arch and partial anomalous pulmonary venous connection. *J Card Surg* **2006**;21:264-6.

Jacobs JP, Mavroudis C, Jacobs ML, Maruszewski B, **Tchervenkov CI**, Lacour-Gayet PG, Clarke Dr, Yeh T Jr, Walters HL, Kurosawa H, Stellin G, Ebels T, Elliot MJ; Defining death in a surgical registry database: a report of the STS Congenital Database Taskforce and the Joint EACTS-STS Congenital Database Committee. *Ann Thorac Surg* **2006**;81:1937-41.

Majnemer A, Limperopoulos C, Shevell M, Rohlicek C, Rosenblatt B, **Tchervenkov C**. Health and well-being of children with congenital cardiac malformations, and their families, following open-heart surgery. *Cardiol Young* **2006**; 16:157-64.

Majnemer A, Limperopoulos C, Shevell M, Rohlicek C, Rosenblatt B, **Tchervenkov C**. Health and well-being of children with congenital cardiac malformations, and their families, following open-heart surgery. *Cardiol Young* 2006;16:157-64.

Jamnemer A, Limperopoulos C, Shevell M, Rosenblatt B, Rohlicek C, **Tchervenkov C**. Long-term neuromotor outcome at school entry of infants with congenital heart defects requiring open-heart surgery. *J Pediatr* **2006**;148:72-7.

**Tchervenkov CI** , Jacobs ML, Del Duca D. Surgery for the functionally univentricular heart in patients with visceral heterotaxy. *Cardiol Young* **2006**;16 Suppl 1:72-9.

Jacobs JP, Franklin RC, Jacobs ML, Colan SD, **Tchervenkov CI**, Maruszewski B, Gaynor JW, Spray TL, Stellin G, Aiello VD, Beland MJ, Krogmann ON, Kurosawa H, Weinberg PM, Elliott MJ, Mavroudis C, Anderson RH. Classification of the functionally univentricular heart: unity from mapped codes. *Cardiol Young* **2006**;16 Suppl 1:9-21.

Majnemer A, Limperopoulos C, Rosenblatt B, **Tchervenkov CI**, Rohlicek C, Gottesman R. Association between Electroencephalographic Findings and Neurologic Status in Infants with Congenital Heart Defects. *J Child Neurol* **2001**; 16:471-476.

Lofland GH, McCrindle BW, Williams WG, Blackstone EH, **Tchervenkov CI**, Jonas RA and the Members of the CHSS. Critical Aortic Stenosis in the Neonate: a Multi-Institutional Study of Management, Outcomes, and Risk Factors. *J Thorac Cardiovasc Surg* 2001; 121:10-27.

**Tchervenkov CI**, Korkola SJ, Shum-tim D. Surgical technique to Avoid Circulatory Arrest and Direct Arch Vessel Cannulation During Neonatal Aortic Arch Reconstruction. *Eur J of Cardio-Thorac Surg*, **2001**; 19-708-710.

**Tchervenkov CI**, Shum-Tim D, Beland MJ, Jutras L, Platt R. Single ventricle with systemic obstruction in early life: comparison of initial pulmonary artery banding versus the Norwood operation. *Eur J Cardio-thorac Surg* **2001**; 19:671-677.

**Tchervenkov CI**, Korkola SJ, Shum-Tim D, Calaritis C, Laliberte E, Reyes T, Lavoie J. Neonatal aortic arch reconstruction avoiding circulatory arrest and direct arch vessel cannulation. *Ann Thorac Surg* **2001**; 72:1615-20.

Shum-Tim D, **Tchervenkov CI**, Jamal A-M, Nimeth T, Luo C-Y, Chedrawy E, Laliberte E, Philip A, Rose CP, Lavoie J. Systemic steroid pre-treatment improves cerebral protection following circulatory arrest. *Ann Thorac Surg* **2001**; 72:1465-71.

Shum-Tim D, **Tchervenkov CI**, Laliberte E, Jamal A-M, Nimeh T, Luo C-Y, Bittira B, Platt R, Philip A, Lavoie J. Timing of steroid treatment is important for neuroprotection during cardiopulmonary bypass and circulatory arrest. *Surgical Forum* **2001**; Vol. LII: 93-4.

Limperopoulos C, Majnemer A, Shevell MI, Roseblatt B, Rohlicek C, **Tchervenkov CI**, Darwish HZ. Functional Limitations in Young Children with Congenital Heart Defects after Cardiac Surgery. *Pediatrics* **2001**; 108:1325-31.

Maruszewski B, Lacour-Gayet F, Elliott MJ, Gaynor JW, Jacobs JP, Jacobs ML, **Tchervenkov CI**, Kurosawa H, Mavroudis C. Congenital Heart Surgery Nomenclature and Database Project: update and proposed data harvest. *Eur J Cardiothorac Surg*. **2002** Jan; 21(1):47-9.

**Tchervenkov CI**, Korkola SJ, Beland MJ. Single-Stage Anatomical Repair of Complete Atrioventricular Canal, Double-Outlet Right Ventricle and Cor-Triatriatum Using Ventricular Septal Defect Translocation. *Ann Thorac Ksurg*. 2002;73:1317-20.

Gaynor JW, Jacobs JP, Jacobs ML, Elliott MJ, Lacour-Gayet F, **Tchervenkov CI**, Maruszewski B, Mavroudis C. Congenital Heart surgery Nomenclature and Database Project: update and proposed data harvest. *Ann Thorac Surg* **2002**; 73:1016-8.

Jacobs JP, Quintessenza JA, Morell VO, Botero LM, van Gelder HM, **Tchervenkov CI**, Minimally-Invasive Endoscopic Repair of Pectus Excavatum. *Eur J Cardio-thorac Surg* **2002**;21:869-73.

Limperopoulos C, Majnemer A, Shevell MI, Rohlicek C, Rosenblatt B, **Tchervenkov CI**, Darwish Hz. Predictor of Developmental Disabilities after Open Heart Surgery in Young Children with Congenital Heart Defects. *J Pediatr* **2002**;141:51-58.

Korkola SJ, **Tchervenkov CI**, Shum-Tim D, Roy N. Aortic rupture after stenting of a native coarctation in an adult. *Ann Thorac Surg* 2002; 74(3):936.

Beland MJ, Jacobs JP, **Tchervenkov CI**, Franklin RCG. The International Nomenclature Project for Congenital Heart Disease. Report from the Executive of The International Working Group for Mapping and Coding of Nomenclatures for Pediatric and Congenital Heart Disease. *Cardiol Young* 2002; 12:425-430.

Franklin RCG, Jacobs JP, **Tchervenkov CI**, Beland MJ. The International Nomenclature Project for Congenital Heart Disease. Bidirectional Crossmap of the Short Lists of the European Paediatric Cardiac Code and the International Congenital Heart Surgery Nomenclature and Database Project. *Cardiol Young* 2002; 12:431-435.

Franklin RCG, Jacobs JP, **Tchervenkov CI**, Beland MJ. Report from the Executive of the International Working Group for Mapping and Coding of Nomenclatures for Paediatric and Congenital Heart Disease. Bi-directional Cross map of the Short Lists of the European Pediatric Cardiac Code and the International Congenital Heart Surgery Nomenclature and Database Project. *Cardiol Young* 2002; 12(Suppl.2):18-22.

Kurosawa H, Gaynor JW, Jacobs JP, Jacobs ML, Elliott MJ, Lacour-Gayet F, **Tchervenkov CI**, Maruszewski B, Mavroudis C. Congenital heart surgery nomenclature and database project. Update and proposed data harvest. *Jpn J Thorac Cardiovasc Surg*. 2002; 50:498-501.

Tsang JC, Morin JF, **Tchervenkov CI**, Platt RW, Sampalis J, Shum-Tim D. Single aortic clamp versus partial occluding clamp technique for cerebral protection during coronary artery bypass: a randomized prospective trial. *J Card Surg* 2003;18(2):158-63.

Ashburn DA, McCrindle BW, **Tchervenkov CI**, Jacobs ML, Lofland GK, Bove EL, Spray TL, Blackstone EH, Williams WG. Outcomes after the Normwood operation in neonates with critical aortic stenosis or aortic valve atresia. *J Thorac Cardiovasc Surg* 2003; 125(5):1070-1082.

Shum-Tim D, **Tchervenkov CI**, Laliberte E, Jamal AM, Nimeh T, Luo CY, Bittira B, Philip A. Timing of steroid treatment is important for cerebral protection during cardiopulmonary bypass and circulatory arrest: minimal protection of pump prime methylprednisolone. *Eur J Cardiothor Surg* 2003; 24:125-132.

Lacour-Gayet F, Clarke D, Jacobs J, Comas J, Daebritz S, Daenen W, Gaynor W, Hamilton L, Jacobs M, Maruszewski B, Pozzi M, Spray T, Stellin G, **Tchervenkov C**, Mavroudis C and the Aristotle Committee. The Aristotle Score: a complexity-adjusted method to evaluate surgical results. *Eur J Cardio-thoracic Surg* 2004; 25:911-24.

Jacobs JP, Mavroudis C, Jacobs ML, Lacour-Gayet FG, **Tchervenkov CI**, Gaynor JW, Clarke Dr, Spray TL, Maruszewski B, Stellin G, Elliott MJ, Dokholyan RS, Peterson ED. Lessons learned from the data analysis of the second harvest (1998-2001) of the Society of Thoracic Surgeons (STS) Congenital Heart Surgery Database. *Eur J Cardio-thoracic Surg* 2004;26:18-37.

Béland MJ, Franklin RCG, Jacobs JP, **Tchervenkov CI**, Aiello VD, Colan SD, Gaynor JW, Krogmann ON, Durosawa, Maruszewski B, Stellin G, Weinberg P. Update from The International Working Group for Mapping and Coding of Nomenclatures for Paediatric and Congenital Heart Disease. *Cardiol Young* 2004; 14:225-299.

**Tchervenkov CI**, Al-khaldi A, Shum-Tim D. Norwood procedure and staged palliation: Antegrade regional cerebral perfusion. *Cardiol Young* **2004**; 14(Suppl.1):70-74.

**Tchervenkov CI**, Hypoplastic left heart complex: indication, criterions and principles for biventricular repair. *Cardiol Young* 2004; 14(Suppl.1):97-100.

Lacour-Gayet F, Clarke D, Jacobs J, Gaynor W, Hamilton L, Jacobs M, Maruszewski B, Pozzi M, Spray T, **Tchervenkov C**, Mavroudis C and the Aristotle Committee. The Aristotle score for congenital heart surgery. *Semin Thorac and Cardiovasc Surg Pediatric Card Surg Annu* **2004**; 7:185-191.

Laliberté E, Cecere R, **Tchervenkov C**, Wan C, Bittira B, Calaritis C, Béland M, Decell M, Reyes T, Shum-tim D. The combined use of extracorporeal life support and the Berlin heart pulsatile pediatric ventricular assist device as a bridge to transplant in a toddler. *J Amer Soc Extra-Corp Tech* **2004**;36:158-161.

McCrinkle BW, **Tchervenkov CI**, Konstantinov IE, Williams WG, Neirotti RA, Jacobs ML, Blackstones EH. Risk factors associated with mortality and interventions in 472 neonates with interrupted aortic arch: A Congenital Heart Surgeons Society Study. *J Thora Cardiovasc Surg* **2005**; 129:343-50.

**Tchervenkov CI**. Surgical management of transposition in the setting of obstruction within the aortic arch. *Cardiol Young* **2005**; 15(Suppl.1):106-110.

Jacobs JP, Maruszewski B, **Tchervenkov CI**, Lacour-Gayet F, Jacobs ML, Clarke DR, Gaynor JW, Spray TL, Stellin G, Elliott MJ, Ebels T, Franklin RCG, Béland MJ, Kurosawa H, Aiello VD, Colan SD, Krogmann ON, Weinberg P, Tobota Z, Dokholyan RS, Peterson ED, Mavroudis C. The current status and future directions of efforts to create a global database for the outcomes of therapy for congenital heart disease. *Cardiol Young* **2005**; (Suppl.1):190-198.

Al-Khaldi A, Chedrawy EG, **Tchervenkov CI**, Shum-Tim D. Successful single-lung Fontan operation in an adult: 5-year follow up. *Ann Thorac Surg* **2005**;79:1042-44.

Jacobs JP, Lacour-Gayet FG, Jacobs ML, Clarke D, **Tchervenkov CI**, Gaynor JW, Spray T, Maruszewski B, Gould J, Dokholyan RS, Peterson ED, Mavroudis C. Initial application in the STS congenital database of a complexity adjustment to evaluate surgical case mix and results. *Ann Thorac Surg* **2005**;79:1635-49.

Jacobs JP, Ungerleider RM, **Tchervenkov CI**, Ebels T, Laliberté E, Maruszewski B, Shen I, Stellin G, Daicoff GR. Opinions from the Audience Response Survey at eh First Joint Meeting of the Congenital Heart Surgeons' Society and the European Congenital Heart Surgeons Association. *Semin Thorac Cardiovasc Surg Pediatr Card Surg Ann* **2005**;8:198-217.

**Tchervenkov CI**, Jacobs JP, Sharma K, Ungerleider RM. Interrupted aortic arch: Surgical decision-making. *Semin Thorac Cardiovasc Surg Pediatr Card Surg Ann* **2005**;8:92-102.

**Tchervenkov CI**, Korkola SJ: Transposition Complexes with Systemic Obstruction. In: Williams WG & Coles JG, Guest Editors. *Semin Thorac and Cardiovasc Surg Pediatric Card Surg Annu*, **2001**;4:71-82. W. B. Saunders Company.



**Tchervenkov CI:** Two-ventricle Repair for Hypoplastic Left Heart Syndrome. In: Williams WG & Coles JG, Guest Editors. Semin Thorac and Cardiovasc Surg Pediatric Card Surg Annu, **2001**;4:83-93. W.B. Saunders Company.

Korkola SJ, **Tchervenkov CI**, Shum-Tim D. Aortic Arch Reconstruction without Circulatory Arrest: Review of Techniques, Applications, and Indication. In: Mavroudis C, Guest Editor. Semin Thorac Cardiovasc Surg Pediatr Card Surg Annu. **2002**;5:116-25.

**Tchervenkov CI**, Chedrawy EG, Korkola SJ. Fontan Operation for Patients with Severe Distal Pulmonary Artery Stenosis, Atresia, or a Single Lung. In: Mavroudis C, Guest Editor. Semin Thorac Cardiovasc Surg Pediatr Card Surg Annu. **2002**;5:68-75.

**Tchervenkov CI:** Transposition of the Great Arteries with Left or Right Ventricular Outflow Tract Obstruction. In: Gardner & Spray eds. Operative Cardiac Surgery, 5 th Edition Chapter 52, pp 757-678. Arnold Publishers, London, England.

**Tchervenkov CI**, Korkola SJ: Straddling and Overriding Atrioventricular Valves. In: Mavroudis & Backer C, ed. Pediatric Cardiac Surgery, 3 rd Edition, Chapter 33, pp 600-611, **2003**.

Korkola SJ, **Tchervenkov CI**, Mavroudis C: Infective Endocarditis. In: Mavroudis & Backer C, ed. Pediatric Cardiac Surgery, 3 rd Edition, Chapter 44, pp 767-777, **2003**.

Shum-Tim D, **Tchevenkov CI**: Aortic Left Ventricular Tunnel. In: Mavroudis C & Backer C(eds) Pediatric Cardiac Surgery, 3 rd edition, Chapter 31, pp 575-579, **2003**.

**Tchervenkov CI**, Chu V, Shum-Tim D: Left Ventricular Outflow Tract Obstruction. In: Mavroudis & Backer C, ed. Pediatric Cardiac Surgery, 3 rd Edition, Chapter 29, pp 537-559, **2003**.