

**Pediatric Cardiology Fellowship
Program
2013/2014**

**Chest Diseases Hospital
Kuwait**

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Pediatric Cardiology Fellowship Program Chest Diseases Hospital Kuwait

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PROGRAM OVERVIEW

- Provides an intensive training experience in the care of children with cardiac disease and people of all ages with congenital heart disease.
- The goal of the program is to train excellent academic congenital heart disease specialists.
- It is a comprehensive three-year program which provides training in the essential diagnostic, therapeutic and consultative skills required of a clinical cardiologist, as well as dedicated time devoted to the pursuit of research and academic endeavors.
- Two positions for fellows available each year.
- Applicants must have completed general pediatric residency program in Kuwait (or an equivalent program).

CHEST DISEASES HOSPITAL

- The Chest diseases Hospital is a tertiary national referral center for adult and children cardiac and chest diseases. It consists of Cardiology, Cardiovascular Surgery, Cardiac Intensive Care, Cardiac Anesthesia and Thoracic Surgery.
- The Department of Pediatric Cardiology works closely with the Pediatric Cardiac Surgery Unit to deliver integrated medical, interventional, and surgical care to a diverse and challenging patient population. The surgical program includes complex neonatal repairs, staged palliations and operations for adults with congenital heart disease.

FELLOWSHIP PROGRAM

- Fellows are the primary caregivers and first line consultants to a wide variety of patients with congenital heart disease, and are given increasing levels of autonomy and independence within a structured environment of education and supervision.
- Training and extensive experience is provided in the performance and interpretation of critical diagnostic tests used in cardiovascular disease such as:
 - Echocardiography : Transthoracic, transesophageal and fetal
 - Cardiac catheterization: Diagnostic & Interventional
 - Electrocardiography & Electrophysiological studies
 - Cardiac magnetic resonance imaging
- Fellows in the program develop proficiency in:
 - Diagnosis and treatment of congenital heart disease
 - Diagnosis and treatment of acquired heart disease in children
 - Diagnosis and treatment of arrhythmia
 - Management of heart failure
 - Valvular Heart Disease
 - Adult congenital heart disease treatment

FELLOWSHIP CURRICULUM

Experience	Total (months)
Inpatient (Ward 8)	6
Echo	7
ICU	5
Cath	4
Fetal	1
EP	1
Adult	1
Surgery	1
MRI	1
Research/ Elective	6
Vacation	3

CLINICAL TRAINING

- Ward 8 (Inpatient)
- Echocardiography Laboratory
- Pediatric Medical Intensive Care Unit
- Cardiac Catheterization Laboratory
- Fetal Cardiology Service
- Electrophysiology Service
- Adult Congenital Service
- Cardiac Surgery Service

TEACHING OPPORTUNITIES

- Foundation Courses on Cardiac Morphology
- Didactic lectures on specific areas of cardiology given by experts
- Patient Management Rounds
- Management Discussion Conference
- Morbidity & Mortality
- Echo Conference
- Journal Club
- Cath, Angiography and Imaging Conference
- Surgical Conference

RESEAECH OPPORTUNITIES

Research opportunities may be allocated up to 6 months of the period of training in the second and third years.

Pediatric Cardiology Department in Chest Diseases Hospital

Pediatric Cardiology Team

Consists of 6 consultants and 15 registrars.

In-patient (ward 8)

Provides inpatient services for children with congenital or acquired heart disease from birth to 12 years of age. It is a 23 bed unit.

Pediatric Cardiac Intensive Care

The Pediatric CICU in Chest Diseases hospital provides coverage for surgical and medical patients

It is divided into Surgical PICU (7 bed unit) and Medical PICU (7 bed unit)

Cardiac Catheterization

About 300 pediatric cardiac catheterizations are performed each year at the Chest Diseases Hospital. Nearly two thirds of these procedures are interventional (ASD, VSD and PDA closures, balloon valvuloplasty and stenting).

Echocardiography

Approximately 9000 echocardiograms are performed per year (transthoracic, transesophageal and fetal echo)

Outpatient Clinics

There are six outpatients clinics per week with about 8000 patient visits per year.

Cardiovascular Surgery

About 230 - 250 pediatric cardiac surgeries are performed each year at the Chest Diseases hospital by our Pediatric Cardiac Surgical team which consists of two consultants and three registrars.

PROGRAM STAFF:

Dr. Ali Al-Hassan – Program Director

Dr. Ayman Sabry – Program Co-Director

Dr. Mustafa Al-Qabandi - Tutor

Dr. Lulu AbuShaban - Tutor

Dr. John Selvan - Tutor

Dr. Babu Uthman – Tutor

Dr. Abdullah Al-Sane - Tutor

Dr. Mariyappa Thinakar – Tutor

Dr. Mohammed Metwally – Tutor

Ms Fazeela Abdul Khader – Secretary

THE CURRICULUM

FIRST YEAR

Echocardiography	4 Blocks
Inpatient Service	3 Blocks
Pediatric Intensive Unit	3 Blocks
Cardiac Catheterization	1 Block
Vacation	1 Block

SECOND YEAR

Echocardiography	2 Blocks
Inpatient Service	1 Block
Pediatric Intensive Unit	1 Block
Cardiac Catheterization	1 Block
Fetal	1 Block
Electrophysiology	1 Block
MRI	1 Block
Elective / Research	3 Blocks
Vacation	1 Block

THIRD YEAR

Inpatient Service	2 Blocks
Cardiac Catheterization	2 Blocks
Echocardiography	1 Block
Pediatric Intensive Unit	1 Block
Surgery	1 Block
Adult	1 Block
Elective / Research	3 Blocks
Vacation	1 Block

PEDIATRIC CARDIOLOGY FELLOWSHIP PROGRAM

Goals and Objectives

The fellowship training program in Pediatric Cardiology is broad in scope covering the spectrum of congenital and acquired heart disease in all age categories. The program emphasizes a balance between learning, teaching and research and the need to have all the understanding and clinical skills to care for the clinical cardiac problems one might encounter in all age groups and clinical situations. The curriculum also includes the understanding of adults with medically-treated or surgically-treated congenital heart disease, as well as fetal and preventive cardiology.

The training period commitment is three (3) years

Rotations	Year One	Year Two	Year Three
Inpatient Service	3	1	2
Echocardiography	4	2	1
Cardiac Cath	1	1	2
ICU	3	1	1
Electrophysiology	-	1	-
Fetal	-	1	-
Adult	-	-	1
Surgery	-	-	1
MRI	-	1	-
Research / Elective	-	3	3
Vacation	1	1	1

The program goals defined below represent those necessary to effectively function as an independent pediatric cardiologist. These program goals are obtained through a program of graduated expectations and responsibilities during the three year fellowship. Evaluation of progress in achieving these goals is made at the conclusion of each level of expertise by faculty directly involved in the specific arena of interest. In general evaluations are made every 1 month and are shared with the pediatric cardiology fellow. The pediatric cardiology fellow, in turn at similar intervals, evaluates the rotations and the program for content, the faculty for teaching within the context of the rotation and finally, provides input for means of improvement of both the rotations and the program.

Objectives for the Inpatient Rotations

General considerations:

The trainee must complete at minimum of six blocks on the Inpatient Cardiology Service (Ward 8) throughout the three-year program. The first three blocks are considered Junior Rotations (level 1) whereas the last three blocks are considered Senior Rotations (level 2) acknowledging that acquisition of knowledge and clinical competence follows a continuum. Indeed, the fellow is expected to consolidate and build on knowledge obtained in previous rotations. As she/he gains experience, the fellow will be given progressive latitude in coordinating the work-up and treatment of inpatients. The last month in Cardiology Ward will give the fellow the opportunity to function as a junior attending.

While on the Inpatient rotation, the fellow is expected attend to the care of all patients admitted under Cardiology and Cardiovascular Surgery. The fellow completes a pre-op consultation on all patients before a planned cardiac surgery. In addition, the trainee assesses all inpatients on a daily basis and documents encounters in the patient's chart. He/she is rounds with the attending cardiologist and collaborates with other health care professionals involved in the care of cardiology patients.

The fellow is also encouraged to participate to the activities of the Consult Service provided this activity does not take interfere with duties on the Inpatient Service or with the educational experience of other fellows rotating through Cardiology. The pediatric cardiology fellow is expected to attend a minimum of two outpatient clinics per week during the Inpatient Rotation. Priority should be given to clinics with the attending cardiologist designated as Supervisor for that specific rotation. If the fellow cannot attend a specific clinic, he/she should advise the attending cardiologist. Each fellow should keep track of all outpatient clinics attended.

During this time the fellow's responsibilities increase as he/she transitions from general pediatrician to subspecialist in pediatric cardiology. The clinical rotation is divided into 2 levels, corresponding to the fellow's level of expertise.

Acquisition of factual information is emphasized in Level 1.

Implementation of skills and development of clinical judgment is emphasized in Level 2.

The Pediatric Cardiology Fellow will achieve these objectives by reading of textbooks and the literature; by attendance at Pediatric Cardiology-CV Surgery Conference, by frequent discussion of patient issues with the Attending Pediatric Cardiologist and other members of the Cardiovascular and Intensive Care.

The Pediatric Cardiology Fellow evaluates and proposes treatment but does not initiate treatment, except in emergency circumstances, without the consent of the Attending Pediatric Cardiologist. The Attending Pediatric Cardiologist holds the final ethical and legal responsibility for the care of all patients on the Pediatric Cardiology Service.

Level 1 (three months)

At the completion of this level the Pediatric Cardiology Fellow will be able to:

1. Obtain a cardiovascular history, perform a cardiovascular examination, including auscultation on infants, children and adolescents with congenital or acquired cardiovascular disease, and present the pertinent findings to attending cardiologist.
2. Recognize abnormalities found on plain chest x-ray.
3. Recognize abnormalities found on routine electrocardiogram.
4. Understand the basic pathophysiology of common congenital cardiac conditions, such as left-to-right shunts, left and right-sided obstructive lesions and admixture lesions.
5. Understand the basic pathophysiology of congestive cardiac failure.
6. Understand the basic pathophysiology of reactive pulmonary vasculature.
7. Understand and recognize the basic abnormalities of cardiac rhythm, including all degrees of atrioventricular block; narrow and wide complex tachyarrhythmia's.
8. Recognize the clinical, electrocardiographic, echocardiographic and laboratory findings of myocardial infarction.

Level 2 (three months)

At the completion of this level the Pediatric Cardiology Fellow will be able to:

1. Recognize symptoms and signs of cardiogenic shock and administer appropriate therapy.
2. Recognize the symptoms and signs of tamponade and administer appropriate therapy.
3. Recognize symptoms and signs of congestive heart failure in infants, children and adolescents and administer appropriate therapy.
4. Recognize the noninvasive symptoms and signs of cardiac transplant rejection.
5. Understand the pathophysiology of ductal dependent congenital cardiac conditions.
6. Understand the pharmacology of inotropic agents and their side effects.
7. Understand the pharmacology of antiarrhythmic agents and their side effects.
8. Understand the pharmacology of standard anti-rejection drugs and their side effects.
9. Be able to program and interrogate temporary pacemakers in all modes.
10. Provide routine post-operative management for infants, children and adolescents after cardiac surgery.
11. Provide full initial evaluation and management of neonates with suspected congenital cardiac anomalies.
12. Provide full clinical evaluation and management of infants, children and adolescents suspected of cardiovascular disease.
13. Provide full clinical evaluation and management of infants, children and adolescents for cardiac transplantation.
14. Provide full clinical evaluation and management of post-transplant recipients for rejection.
15. Provide full clinical evaluation and stabilization of infants, children and adolescents with syncope.
16. Provide full clinical evaluation and stabilization of infants, children and adolescents with narrow and wide QRS tachycardia.

17. Be able to interrogate and program permanent pacemakers.
18. Know the indications for electrophysiologic evaluation of syncope, narrow and wide QRS tachycardia.
19. Know the indications for catheter ablation of tachyarrhythmias.
20. Know the indications for pacemaker placement.
21. Know the indications for cardiac catheterization.
22. Know the indications for endomyocardial biopsy for transplant rejection.
23. Know the indications for cardiac surgery.

Medical expert	Learning strategies
<p>Objectives for the Inpatient Rotation:</p> <p>To attain this competency the fellow will demonstrate:</p> <ol style="list-style-type: none"> 1. Proficiency in obtaining an accurate history and cardiac physical examination on patients admitted to the cardiology/CV surgery services (and of patients referred for cardiology consultation) 2. Knowledge of the natural and unnatural history of congenital cardiac malformations, the long-term outlook and possible complications 3. Detailed knowledge of symptoms and physical signs relevant to each cardiac malformation in the native or post-operative state 4. An understanding of cardiac physiology as it pertains to inpatients in the pre and post operative state 5. An understanding of single ventricle physiology in it's various stages of palliation 6. Knowledge of indications for ancillary cardiac investigations: CXR, ECG, echocardiogram 7. An ability to accurately interpret CXR and ECG's on inpatients 8. An ability to formulate an accurate and clear impression, including a differential diagnosis 9. An ability to formulate an appropriate daily plan for patients admitted with a cardiac disorder 10. Evaluation of the critically ill child with cardiac disease 11. Knowledge of the indications, pharmacodynamics, adverse effects, and use of commonly prescribed cardiac medications 12. Knowledge of appropriate nutritional management of pre- and post-operative cardiac patients 13. An ability to appropriate manage pediatric inpatients with acute and chronic congestive heart failure 14. An ability to diagnose and treat arrhythmia in inpatients with cardiac disease 15. An ability to perform and interpret tracings obtained from temporary epicardial wires in the post-operative cardiac patient 16. An ability to appropriately use temporary pacemakers after open heart surgery 	<p>The fellow will:</p> <p>Read pertinent chapters in textbooks of pediatric cardiology</p> <p>Attend CVT-cardiology conferences</p> <p>Attend pertinent Cardiology or CVT conferences</p> <p>Prepare presentations for Cardiology Rounds</p> <p>Participate at fellow tutorials</p>

<p>17. Principles of pharmacologic and non-pharmacologic manipulation of pulmonary vascular resistance</p> <p>18. Familiarity with the appropriate use of advanced cardiac investigations as they apply to the hospitalized patient with congenital or acquired cardiac disease (cardiac catheterization, cardiac MRI and nuclear medicine)</p> <p>19. Familiarity with the CNS sequelae of congenital heart disease</p>	
<p>Communicator</p> <p>To attain this competency the fellow will demonstrate:</p> <ol style="list-style-type: none"> 1. An ability to orally present a clear and succinct summary of an assessment of a patient including an impression and management plan 2. An ability to formally present cases for discussion in Cardio-CVT rounds 3. An ability to communicate effectively with patients and families 4. An ability to communicate effectively with allied health care professionals 5. An ability to generate a clear and succinct progress note in a timely fashion 	<p>Observe then emulate communication techniques demonstrated by attending cardiologist(s)</p>
<p>Collaborator</p> <p>To attain this competency the fellow will demonstrate:</p> <ol style="list-style-type: none"> 1. An ability to work effectively as part of a team of health care professionals 2. Sensitivity to each team member's area of expertise 	<p>Attend multidisciplinary meetings Be given progressive latitude in coordinating the care of patient's under her/his care</p>
<p>Manager</p> <p>To attain this competency the fellow will demonstrate:</p> <ol style="list-style-type: none"> 1. An ability to rationalize diagnostic and therapeutic resources on the inpatient service 2. Understanding of factors governing quality control on the wards and in the intensive care 3. An ability to prioritize resources (time, manpower, diagnostic and therapeutic facilities) 	<p>Be given progressive latitude in coordinating the diagnostic evaluation of patients under her/his care</p> <p>Participate at departmental morbidity and mortality rounds</p> <p>Coordinate the organization of specific academic activities</p>

<p>Health Advocate</p> <p>To attain this competency the fellow will demonstrate:</p> <p>Initiative in advocating for her/his patient at the institutional and societal level</p>	<p>Seek opportunities to advocate for the patient at the institutional and societal level</p>
<p>Scholar</p> <p>To attain this competency the fellow will demonstrate:</p> <ol style="list-style-type: none"> 1. Initiative and academic curiosity 2. An ability to critically appraise medical literature as it pertains to inpatients 3. Proficiency in maintaining a teaching portfolio and tracking clinical and academic encounters 	<p>Critically review literature in the setting of a Journal Club Give formal and informal presentations Seek opportunities to become involved in structured academic activities Maintain a log of clinical and academic activities</p>
<p>Professionalism</p> <p>To attain this competency the fellow will demonstrate:</p> <ol style="list-style-type: none"> 1. An ability to practice medicine ethically 2. Adequate interpersonal behavior 3. Proficiency in acting as a consultant 4. Sensitivity to patient-specific health issues in a way that will preserve dignity and privacy. 5. Sensitivity to patient's racial, ethnic and cultural background 6. An ability to be punctual 	<p>Emulate positive behavior in attending cardiologists Attend professionalism workshops when available</p>

Objectives for Pediatric Intensive Care Unit Rotations

General considerations:

Clinical rotation in the Pediatric Intensive Care Unit (PICU) in the Chest Diseases hospital in which the fellow has responsibility for clinical care and coordination of care for critically ill pediatric cardiac patients as well as consultations on other services for stabilization and/or transfer to the PICU. The fellow is expected to complete five blocks in the PICU during the three-year training program. The fellow will carry on on-call suites as mandated by the PICU call schedule. He/she is expected to participate in all academic activities of the PICU while on this rotation.

The fellow is expected to acquire some technical mastery over procedural skills encountered in the PICU including: insertion of central lines, insertion of arterial lines for invasive blood pressure monitoring, insertion of chest tubes, pericardiocentesis, overdrive pacing using an external pacemaker, synchronized cardioversion and defibrillation. It is recognized that the opportunity for exposure to some of these procedural items is unpredictable during a one-month block. The fellow is encouraged nonetheless to attempt to maximize his/her learning of these technical procedures during the PICU rotation.

Rotation Goals

Clinical experience will facilitate evidence-based knowledge acquisition regarding the physiology, pathophysiology and pharmacology of critical illness due to cardiac disease such that the fellow is able to provide compassionate, age appropriate and effective management of neonates and children with single organ to multiple organ system failure due to congenital or acquired cardiac disease.

Patient Care:

Goal

Comprehensive knowledge of the physiology, pathophysiology, pharmacology, and evidence-based literature to enable proficient, compassionate, age-appropriate clinical management of children critically ill due cardiac disease or interventional management of cardiac disease.

Objectives

1. Evaluate and manage neonates and infants with critical structural cardiac disease.
 - a) Perform comprehensive physical exam, generate differential diagnosis, understand how to establish accurate anatomic diagnosis with chest radiograph, echocardiography, electrocardiography, angiogram, and laboratory data, and ascertain relevant cardiopulmonary physiology. Specific lesions: VSD, ASD, PDA, AS, PS, AV canal, Coarctation, Transposition, Hypoplastic Left Heart, Tuncus Arteriosus, Total/Partial Anomalous Pulmonary Venous Return)
 - b) Provide appropriate medical therapy to stabilize patient.
 - c) Understand what medical and surgical treatment options are appropriate for short and long-term management of the condition.
 2. Be able to manage:
 - a) Ductal-dependent right- and left-sided obstructive lesions.
 - b) D-Transposition.
 - c) Total anomalous pulmonary venous connection with obstruction.
 - d) Anomalous origin of the left coronary artery.
 3. Evaluate and treat neonates, infants and children with critical cardiac disease.
 - a) Primary myocardial dysfunction.
 - b) Acute decomposition due to myocarditis or cardiomyopathy.
 - c) Acutely symptomatic arrhythmias, including appropriate use of cardioversion and pacing options.
 - d) Pericardial effusion / cardiac tamponade.
 - e) Hypertension and hypotension.
 - f) Hypercyanotic episode.
 - g) Elevations of pulmonary vascular resistance.
 4. Understand how to incorporate diagnostic studies, such as echocardiograms and catheterization data, into patient care decisions.
 5. Provide peri-and post-operative patient care.
 - a) Understand current surgical techniques, particularly neonatal cardiac surgery, mechanical ventilation, cardiopulmonary bypass and hypothermia, to provide appropriate post-operative care.
 - b) Manage pharmacologic agents to support cardiovascular function including intravenous inotropes, vasodilator, diuretics, sedatives and analgesics
 - c) Optimize respiratory support and provide ventilator management
 - d) Optimize nutrition
 - e) Recognize and manage post-operative complications
 - f) Manage ECMO
-

6. Recognize and perform any necessary resuscitation and stabilization:
 - a) Promptly recognize clinical signs and symptoms heralding the onset of life-threatening events.
 - b) Expeditiously and appropriately intervene to prevent the onset of cardiopulmonary arrest.
 - c) Thoroughly understand the basic principles of cardiopulmonary resuscitation and stabilization.
 - d) Perform appropriately as the critical care team leader during cardiopulmonary resuscitation and stabilization.
 - e) Recognize the pathophysiology associated with tissue hypoxia/ischemia and properly institute medical management to minimize secondary injury.

 7. General information gathering:
 - a) Perform an appropriately detailed problem-oriented history and physical examination.
 - b) Assimilate, organize, and succinctly summarize all pertinent previously obtained medical information from the casualty room, general medical/surgical unit, outside hospital, and/or clinic.
 - c) Informatively discriminate diagnostic interventions based upon parent/patient information, previous medical information, patient and family preference, scientific evidence, and clinical judgment.
 - d) Discuss the indications, limitations, and risks of diagnostic studies and interpret abnormalities in the context of disease-specific pathophysiology.
 - e) Formulate an age-appropriate differential diagnosis with appropriate prioritization.
 - f) Expeditiously utilize all diagnostic information in the development, execution, and evolution of logical, effective therapeutic management strategies.

 8. General patient management and decision-making:
 - a) Discuss the indications for admission to and discharge from the Pediatric Intensive Care Unit (PICU), including indications for emergent intervention and stabilization prior to transport to the PICU.
 - b) Coordinate care of the PICU patient with the consultant cardiologist, cardiothoracic surgeon, critical care attending, consultants, ancillary services, and primary care physicians.
 - c) Coordinate orderly transfer of care to another health care provider when PICU care is no longer required.
 - d) Notify the consultant cardiologist regarding major changes in the clinical status of any patient in the PICU.
 - e) Review, evaluate, and triage referrals from the casualty room, and general medical/surgical areas. All patients who are evaluated, but not transferred to the PICU require a note in the medical chart outlining recommendations from the PICU team
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9. Acquisition of procedural skills:

- a) Thoroughly understand the anatomic considerations, correct techniques, indications/contraindications, and potential complications for all clinical procedures required for the care of critically ill cardiac patients.
- b) Expertly perform appropriate procedures based on skill level with appropriate supervision:
 - o Arterial Puncture
 - o Lumbar Puncture
 - o Peripheral Vein Cannulation
 - o Umbilical Vein Cannulation
 - o Umbilical Artery Cannulation
 - o Femoral Vein Cannulation
 - o Femoral Artery Cannulation
 - o Swan-Ganz catheter placement
 - o Pericardiocentesis

Medical expert

To attain this competency the fellow will demonstrate a knowledge of:

- a. Principles of invasive hemodynamic monitoring: applications specific to the cardiac patient (telemetry, invasive blood pressure monitoring, intracardiac lines, Foley catheters, chest tubes)
- b. Recognition and treatment of low cardiac output syndrome in the post-operative cardiac patient
- c. Recognition and treatment of acute heart failure
- d. Recognition of respiratory failure and respiratory support in the cardiac patient
- e. Principles of fluid management with particular attention to the post-operative cardiac patient
- f. Principles of nutrition and feeding in the cardiac patient before and after cardiac surgery
- g. Principles of use of blood products in the post-operative cardiac patient
- h. Recognition and treatment of multiorgan failure in the post-operative cardiac patient
- i. Diagnosis and treatment of arrhythmia in the cardiac patient
- j. Use of temporary pacemakers in the post-operative cardiac patient
- k. Principles of pharmacologic and non-pharmacologic manipulation of pulmonary vascular resistance
- l. Pharmacology and use of inotropic support
- m. Pharmacology and use of antiarrhythmic medications in the post-operative patient
- n. Pharmacology and use of diuretics in the cardiac patient
- o. Pharmacology and use of antihypertensive medications in the cardiac patients
- p. Pharmacology and use of sedation/analgesic agents in the cardiac patient
- q. Principles of extra-corporeal cardiac support (ECMO) and indications for use
- r. Evaluation of the critically ill child with admission to the unit when necessary

Learning strategies**The fellow will:**

Read pertinent chapters in textbooks of pediatric cardiology and pediatric intensive care
Attend CVT-cardiology conferences
Participate at academic activities in the PICU

<p>The fellow should also be able to:</p> <ol style="list-style-type: none"> a. Formulate an accurate appraisal of the patient's overall status and acuity of disease b. Provide an appropriate differential diagnosis c. Formulate a clear and appropriate management plan for patients under his/her care 	
<p>Communicator To attain this competency the fellow will demonstrate: An ability to communicate effectively with families: verbal communications should be accurate, timely and formulated using terminology that is accessible to families; when appropriate, communication should have therapeutic value and provide reassurance/comfort to families. An ability to communicate effectively with other health care professionals including other medical staff at various level of training, nurses, respiratory technicians and various consultants An ability to generate accurate, complete and concise verbal updates to the team during morning and evening rounds An ability to produce accurate, concise and legible progress notes on patients followed</p>	<p>Observe then emulate communication techniques demonstrated by attending intensivists</p>
<p>Collaborator To attain this competency the fellow will demonstrate: An ability to work effectively as part of a team of health care professionals Sensitivity to each team member's area of expertise</p>	<p>Attend multidisciplinary meetings Be given progressive latitude in coordinating the care of patient's under her/his care</p>
<p>Manager To attain this competency the fellow will demonstrate: An ability to rationalize diagnostic and therapeutic resources Understanding of factors governing quality control in the PICU An ability to prioritize resources (time, manpower, diagnostic and therapeutic facilities)</p>	<p>Be given progressive latitude in coordinating the diagnostic evaluation of patients under her/his care</p>

<p>Health Advocate To attain this competency the fellow will demonstrate: Initiative in advocating for her/his patient at the institutional and societal level</p>	<p>Seek opportunities to advocate for the patient in the PICU and at the institutional level, when indicated</p>
<p>Scholar To attain this competency the fellow will demonstrate: Initiative and academic curiosity An ability to critically appraise medical literature Proficiency in maintaining a teaching portfolio and tracking clinical and academic encounters</p>	<p>Critically review literature Give formal and informal presentations in the PICU Seek opportunities to become involved in structured academic activities Maintain a log of clinical and academic activities</p>
<p>Professionalism To attain this competency the fellow will demonstrate: An ability to practice medicine ethically Adequate interpersonal behavior Proficiency in acting as a consultant Sensitivity to patient-specific health issues in a way that will preserve dignity and privacy. Sensitivity to patient's racial, ethnic and cultural background An ability to be punctual</p>	<p>Emulate positive behavior in attending intensivists Attend professionalism workshops when available</p>

Objectives for Echocardiography Rotations

General considerations:

Over the course of this three-year program the fellow will become proficient in the discipline of pediatric cardiac echocardiography.

The fellow will learn:

- To work autonomously in the echocardiography laboratory
- To understand how echocardiography is integrated in a diagnostic, treatment and surveillance strategy of fetuses, infants and children with congenital and acquired heart disease
- To provide consultant advice based on the results of the echocardiogram.

The overall goal is that pediatric cardiology fellows understand the principles of echo and Doppler, and become proficient in performing and interpreting transthoracic, transesophageal and fetal echocardiograms.

These goals pertain to congenital and acquired pediatric heart disease.

A minimum of 300 studies will be performed by each fellow.

Fellows will spend Eight -one-month rotations on the echocardiography service (including fetal). In addition they will perform and interpret studies on night calls. Skills in echocardiography are also acquired in a longitudinal fashion.

For example, transthoracic echocardiograms may be performed and interpreted by the fellow when on the consultation service, during an intensive care rotation or when on-call. The fellow may be asked, even off duty, to participate to less frequently performed procedures, such as echo-guided balloon atrial septostomies or pericardiocentesis. The skills in transoesophageal echocardiography are taught in the second year but the fellow is encouraged to attend and assist on these studies throughout the second and third years of the program. The fellow who wishes to perfect his/her skills in fetal echocardiography can participate in these studies throughout the second year and the elective period.

Year 1 (four months)

- Become familiar with the basic principles of echocardiography and Doppler, transducer selection, and operation of the equipment
- Obtain basic transthoracic echocardiographic views
- Assess independently: systolic ventricular function, pericardial effusion, situs, and simple forms of congenital heart disease.

Year 2 & 3 (four months)

- Assess the more complex types of congenital and acquired heart disease
- Increase the number and quality of studies performed
- Type reports of all echocardiograms performed which will be cosigned by the consultant pediatric cardiologist in-charge of echo.
- Understand the indications for transthoracic echocardiography
- Learn the techniques of fetal echocardiography
- Understand fetal cardiac physiology as defined by cardiac ultrasound and Doppler techniques.
- Learn the techniques of transesophageal echocardiography
- Provide assistance to Year 1 Pediatric Cardiology Fellows and junior registrars in obtaining transthoracic echocardiograms.

Objectives for the Senior Rotations: Blocks 4-8

To attain this competency the fellow will demonstrate:

- a. An ability to technically perform and interpret a complete two-dimensional and Doppler transthoracic echocardiogram in patients with more complex forms of congenital heart disease (e.g. Tetralogy of Fallot, univentricular connections, double outlet right ventricle, transposition of the great arteries, total anomalous pulmonary venous connection) both pre- and postoperatively
- b. An ability to perform and interpret a transoesophageal echocardiography (TEE) including:
 - Indications and contraindications for TEE
 - Probe selection and insertion technique
 - Manipulation of probe and generation of adequate images
- c. An ability to perform and interpret a fetal cardiac echocardiography including:
 - Demonstrate familiarity with the indications for fetal echocardiography
 - Generate high quality echocardiographic images of the fetal heart
 - Recognize normal and abnormal cardiac structures in the fetal heart
 - Recognize normal and abnormal umbilical and uterine artery Doppler waveforms
 - Recognize fetal hydrops
 - Be able to diagnose and manage fetal tachy and bradyarrhythmias
 - Demonstrate knowledge of maternal drug therapy on the fetus
 - Demonstrate knowledge of the natural history of structural abnormalities and arrhythmias diagnosed in utero.
- d. An understanding of the role of echocardiography in assisting cardiac interventions (peri-operative assessment, interventional cardiac interventions)
- e. An ability to make clinical decisions based on the information obtained from cardiac echocardiography in the diagnosis, treatment and follow-up of fetuses, infants and children with congenital and acquired heart disease

Perform complete scans in patients with complex heart disease with supervision from senior registrars and attending cardiologists

Learn to perform TEE under the direct supervision of the attending cardiologist

Learn to complete fetal echocardiograms with supervision from attending cardiologists

Perform TEE for pre and post operative assessment under the supervision of the attending cardiologist

<p>Communicator</p> <p>To attain this competency the fellow will demonstrate:</p> <p>An ability to explain to parents and the child (when appropriate) the indications and the nature of the echocardiogram</p> <p>An ability to produce an accurate and concise written echocardiography report in a timely fashion</p> <p>An ability to communicate effectively the results of the echocardiogram to parents and the child (when appropriate)</p> <p>An ability to communicate effectively the results of the echocardiogram to other health care professionals</p>	<p>Observe then emulate communication techniques demonstrated by attending cardiologist(s)</p>
<p>Collaborator</p> <p>To attain this competency the fellow will demonstrate:</p> <p>An ability to work effectively as part of a team of health care professionals in the echo lab</p> <p>Sensitivity to each team member's area of expertise</p>	<p>Be given progressive latitude in acting upon the results of echocardiograms for patient's under her/his care</p>
<p>Manager</p> <p>To attain this competency the fellow will demonstrate:</p> <p>An ability to rationalize diagnostic resources in the echocardiography laboratory</p> <p>Understanding of factors governing quality control</p> <p>An ability to prioritize resources (time, manpower, diagnostic and therapeutic facilities)</p> <p>Appropriate leadership skills for his/hers level of training</p>	<p>Be given progressive latitude in ordering and interpreting echocardiograms for patients under her/his care</p> <p>Participate at departmental morbidity and mortality rounds</p> <p>Coordinate the organization of specific academic activities</p>
<p>Health Advocate</p> <p>To attain this competency the fellow will demonstrate:</p> <p>Initiative in advocating for her/his patient at the institutional and societal level</p>	<p>Seek opportunities to advocate for the patient at the departmental and institutional level</p> <p>Write essays on pertinent advocacy topics</p>

<p>Scholar</p> <p>To attain this competency the fellow will demonstrate:</p> <ul style="list-style-type: none"> Initiative and curiosity An ability to critically appraise medical literature Proficiency in maintaining a teaching portfolio and tracking clinical and academic encounters 	<ul style="list-style-type: none"> Critically review literature in the setting of a Journal Club Give formal and informal presentations Seek opportunities to become involved in structured academic activities Maintain a log of completed echocardiograms and pertinent academic activities
<p>Professionalism</p> <p>To attain this competency the fellow will demonstrate:</p> <ul style="list-style-type: none"> An ability to practice medicine ethically Adequate interpersonal behavior Proficiency in acting as a consultant Sensitivity to patient-specific health issues in a way that will preserve dignity and privacy. Sensitivity to patient's racial, ethnic and cultural background An ability to be punctual 	<ul style="list-style-type: none"> Emulate positive behavior in attending cardiologists Attend professionalism workshops when available

Outpatient Pediatric Cardiology Clinic

The Pediatric Cardiology Fellow attends an outpatient clinic once a week for the entire 36-month period of the fellowship. The date and time of the follow-up clinic is assigned by the Pediatric Cardiology Fellowship Program Director and this assignment remains the same throughout fellowship. The fellow is supervised in the outpatient clinic by the Attending Pediatric Cardiologists. The fellow sees no patients without supervision.

The goals and objectives for the outpatient clinic rotation are defined on a yearly basis as identified by Levels 1, 2 and 3.

Level 1 (one year)

1. Obtain an accurate cardiac history, including present complaint, past medical history, family history, and social history
2. Perform an accurate cardiac examination
3. Formulate a differential diagnosis
4. Present findings and differential diagnosis to Attending Pediatric Cardiologist

Level 2 (one year)

1. Obtain history, examination, differential diagnosis and presentation as in Level 1
2. Propose and defend further investigation to Attending Pediatric Cardiologist
3. Present patient, as indicated, at Combined Pediatric Cardiology Cardiovascular Surgery Conference

Level 3 (one year)

1. Obtain history, examination, differential diagnosis and presentation as in Level 1
2. Propose and defend further investigation as in Level 2
3. Propose and defend further medical or surgical treatment to Attending Pediatric Cardiologist
4. Present patient and defend proposed medical or surgical therapy at Combined Pediatric Cardiology-Cardiovascular Surgery Conference

Cardiac Catheterization Rotations

General considerations:

The fellow should complete four cardiac catheterization rotations at the end of three years of training. The fellow is supplied with two sets of objectives that are blended in this document: Junior objectives (blocks 1,2) and Senior objectives (blocks 3,4). The fellow is responsible for reviewing all pertinent data before participating in the heart catheterization. The trainee is expected to, to his/her best abilities explain the procedure to the patient/parents and review, potential complications, and ensures consent is signed before starting the procedure. He/she should have a clear idea of the indications to perform the procedure and which information is to be extracted from the test. The fellow should have formulated a plan for the intervention including technical issues, such as route of intravascular access, catheter choice, catheter course and angiography projections specific for the anatomy. A short pre-cath meeting will take place immediately preceding the procedure, at which time the fellow will present this information to the entire team. The trainee should understand sedation issues pertinent to each patient. The fellow will attend to the care of the patient before and after the procedure. Patient encounters should be documented in the patient's chart. He/she is responsible for providing discharge instructions and arranging appropriate follow-up.

The trainee is expected to complete a heart catheterization report within 24 hours of completing the procedure using the available Ped-Cath software. He/she should then ensure that the report including the angiographic data has been reviewed with the attending cardiologist.

The fellow should be ready to present the results of the heart catheterization at the time of the CVT-cardiology rounds. Each fellow should keep track of all heart catheterization at which he/she has participated.

Junior Level Fellow (1st-2nd Cath Month)

Theoretical Knowledge - Hemodynamic and Data Collection

By completion of the first 2 months of cath lab rotations, the "Junior Level" Fellow should gain and demonstrate an understanding of:

- I. Basic radiation safety
- II. Normal and abnormal intracardiac/intravascular pressures.
 1. The fellow should understand how the intrathoracic pressures are affected by the respiratory cycle and type of ventilation (spontaneous negative pressure vs. positive pressure ventilation) and use this knowledge to correctly interpret the pressure data recordings obtained.
 2. The fellow is expected to be able to generate a differential diagnosis of abnormal findings on review of the pressure tracings

3. The assessment of the fellow's understanding will be by discussions of the pressure recordings during and after the procedure, discussion of the differential diagnoses of abnormal pressure gradients, and by review of the interpretations made by the fellow in the reports and during conferences.

III. Hemodynamic Calculations.

The fellow should be able to:

1. Understand and interpret the oximetry data obtained
2. Calculate the Qp and Qs by the Fick equation.
3. Calculate the Qef and use it to quantify left-to-right and right-to-left shunts
4. understand how inclusion or exclusion of the dissolved oxygen in calculating the O2 content affects the results of Qp and Qs calculations
5. Demonstrate a basic understanding of the assumptions that are made in the calculations performed and how the assumptions may affect the data generated
6. Plan a basic right and left heart catheterization, with appropriate selection of sheaths, catheters, and angiograms to be performed

The assessment of the fellow's understanding will be by discussions of the calculations during and after the procedure, discussion of the differential diagnoses of findings, and by review of the interpretations made by the fellow in the reports and during conferences.

IV. Angiogram Interpretation

The fellow should be able to describe the angles of the image acquisition, the position of the catheters, and the basic cardiovascular structures visualized in the angiogram.

Theoretical Knowledge - Interventional Catheterizations

By completion of the first 2 months of cath lab rotations, the "Junior Level" Fellow should gain and demonstrate an understanding of:

1. The indications for percutaneous interventions, including:
 - o Pulmonary Balloon Valvuloplasty
 - o Aortic Balloon Valvuloplasty
 - o PDA Occlusion
 - o ASD Occlusion
2. Goals of the intervention and how to assess the adequacy of the aforementioned interventions and ability to relate to others the risks of interventional procedures

Practical Skills

By completion of the first 2 months of cath lab rotations, the “Junior Level” Fellow should be able to demonstrate an ability to perform the following with proficiency:

1. Proper positioning of the patient, with attention to leg positioning to optimize femoral vascular accessibility
2. Prepare the sterile field
3. Provide adequate local anesthesia safely and effectively
4. Demonstrate the proper steps in performance of the modified Seldinger technique for obtaining vascular access
5. Properly prepare and secure vascular access sheaths
6. Properly prepare hemodynamic, angiographic, and balloon catheters
7. Demonstrate proper “airless” technique for attaching catheters to the contrast injector
8. Properly insert different types of catheters into the access sheaths and maneuver them into the heart

By completion of the first 2 months of cath lab rotations, the “Junior Level” Fellow should be able to demonstrate an ability to perform the following with developing ability:

1. Achieve femoral vascular access > 50 % of patients taken to the cath lab
2. Demonstrate the ability to perform the basic catheter manipulations required to enter all unobstructed cardiovascular structures, including the systemic veins, RA, RV, PAs, aortic arch, and retrograde approach into the LV. The fellow should also begin to have the ability to cross a preexisting intraatrial communication, enter the pulmonary veins, and obtain LV access from an ante grade approach.
3. Demonstrate the ability to assist in the performance of catheter exchanges over a wire.
4. Demonstrate ability to properly position a balloon catheter within a stenotic semilunar valve and perform a hand inflation to dilate the valve.
5. Observe and, if the appropriate case arises, perform a balloon atrial septostomy

Senior Level Fellow (3rd-4th Cath Month)

Theoretical Knowledge - Hemodynamic and Data Collection

By completion of the second 2 months of cath lab rotations, the “Senior Level” Fellow should gain a progressive proficiency of all of the objectives of the “Beginning Level” Fellow, as well as demonstrate an understanding of:

a. Hemodynamic calculations

The fellow should be able to:

1. Demonstrate a developing ability to analyze and interpret hemodynamic data as it is being collected during the case
2. Determine whether or not the data seems accurate as well as to begin to develop a differential diagnosis and draw clinical conclusions before the termination of the procedure.
3. Analyze data to determine whether patients with single-ventricle physiology are acceptable candidates for surgical palliation

b. Angiogram Interpretation

The fellow should be able to interpret complex structural abnormalities, as well as functional information about ventricular function and valve function (i.e. degree of regurgitation).

Theoretical Knowledge - Interventional Catheterizations

By completion of the second 2 months of cath lab rotations, the “Senior Level” Fellow should gain a progressive proficiency of all of the objectives of the “Junior Level” Fellow. Additionally they should demonstrate an understanding of the indications for percutaneous interventions, (including transseptal puncture, pulmonary artery angioplasty/stenting, and aortic angioplasty/stenting,) goals of the intervention, and how to assess the adequacy of the aforementioned interventions. As well demonstrate an understanding of:

The indications for percutaneous interventions, including:

1. Selection of proper PDA coils/device
2. Selection of proper ASD device
3. Advanced stenting procedures (systemic/pulmonary veins)
4. Advanced occlusion procedures (AVMs, large collaterals)
5. Hybrid catheter-surgical procedures
6. Some advanced techniques (i.e. VSD closure)

Practical Skills

By completion of the second 2 months of cath lab rotations, the “Senior Level” Fellow should be able to demonstrate an ability to perform the following with proficiency:

1. All of the goals and objectives of the “Junior Level” Fellow
2. Be the primary operator in performance of catheter exchanges

By completion of the second 2 months of cath lab rotations, the “Senior Level” Fellow should be able to demonstrate an ability to perform the following with developing ability:

1. Achieve femoral vascular access > 80 % of patients taken to the cath lab
2. Demonstrate the ability to perform the basic catheter manipulations required to perform a right and left heart catheterization in a patient with a structurally normal heart or with less complex congenital heart defects. The fellow should be able to enter all unobstructed cardiovascular structures, including preexisting intra-arterial communications, pulmonary veins, and cross the mitral valve ante grade into the LV. The fellow should demonstrate a beginning ability to cross some stenotic lesions by using different combinations of catheters and wires.
3. Demonstrate the developing knowledge of the different types of wires/catheters and the advantages/disadvantages of the different properties of each.
4. Demonstrate ability to properly prepare balloon catheters, place them within a stenotic vessel and perform a device-assisted inflation to dilate the vessel.
5. Perform a balloon atrial septostomy under transthoracic echocardiographic guidance
6. Perform angiograms, with proper consideration of the appropriate type of catheter, selection of camera angles, and determination of acceptable contrast delivery.
7. Have a working knowledge of how to manipulate the cath lab table, biplane cameras, and use of software for making basic angiographic measurements
8. Perform an emergency balloon atrial septostomy under transthoracic echo guidance.

<p>Role: Medical Expert</p> <p>Objectives for the Junior Heart Cath Rotation</p> <p>To achieve this competency at the Junior Cath Fellow level the fellow should demonstrate the knowledge of:</p> <ol style="list-style-type: none"> 1. The role and indications for cardiac catheterizations in the investigation and treatment of children with heart disease. 2. Basic cardiac hemodynamic principles. These include: 3. Normal cardiovascular physiology and pressure tracings in the normal heart 4. Cardiac output and various methods to measure it; limitations and advantages of each method 5. The design and function of catheterization laboratory equipment including the physiological recorder, the pressure transducer and the blood gas analyser 6. Intracardiac and extracardiac shunts 7. Qp, Qs, Qep and how to calculate them 8. Calculation of vascular resistance 9. Calculation of valve area 10. Evaluation of ventricular function (systolic and diastolic) by catheterization 11. Determinants of pulmonary vascular resistance and pharmacological manipulation of pulmonary vascular bed for therapeutic or diagnostic purposes 12. Evaluation of stenotic lesions at catheterization (gradients, valve area determination) 13. Relationship between hemodynamic data obtained at heart catheterization and other less invasive methods of deriving hemodynamic information 14. The physiology underlying common cyanotic congenital heart disease (ductal dependent lesions, transposition physiology) 15. The physiology underlying common acyanotic heart disease 16. The physiology of left-sided obstructive lesions 17. The physiology of pericardial restriction and how it is influenced by loading conditions, respiratory phase, heart rate etc 18. The physiology of atrioventricular valve disease (stenosis and regurgitation) 19. The influence of inotropic medications on cardiac hemodynamics; the role of inotropic stimulation in the evaluation of dynamic obstructive lesions 20. Basic principles of fluoroscopy, angiography and radiation safety 21. Physical principles and chain of events leading to image generation on the image intensifier 	<p>Strategies</p> <p>The fellow will:</p> <p>Read appropriate chapters in reference textbooks of pediatric cardiology</p> <p>Review patient file before heart cath</p> <p>Analyze and interpret hemodynamic data generated by each heart catheterization then draft the cath report</p> <p>Review angiograms with attending staff</p> <p>Attend to the care of the patient after the heart catheterization</p> <p>Attend tutorials on heart catheterization.</p> <p>Present on heart catheterization topics at cardiology rounds</p> <p>Prepare for written exams on cath material</p>
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22. Determinants of image quality
23. Normal cardiac cineangiography
24. Cineangiography of various congenital heart malformations
25. Use of angled biplane cineangiography for diagnosis of congenital heart disease
26. Common contrast material in use, means of administration and important potential side-effects
27. Methods of minimizing radiation exposure to the patient and the operator while maintaining image quality
28. Different types of diagnostic catheters and their indications for use
29. Risks and potential complications of heart catheterization in neonates, infants and children
30. Influence of age on type and frequency of complications of heart catheterization
31. Type of heart catheterization intervention and frequency of specific complications

The fellow should also demonstrate competence in:

Performing a preliminary work-up of each catheterization, including:

1. A review of all pertinent information to that patient such as medical history, previous heart catheterization (s), most recent echocardiogram, X-rays, ECG's, MRI's and recent blood work
2. A focused physical examinations preceding the heart catheterization
3. A plan for the heart catheterization including the choice of introducers, catheters, catheter course, and the choice of angiographic views to demonstrate relevant information
4. Handling procedural-related complications such as:
 - a. Catheter induced arrhythmia
 - b. Cardiovascular collapse and resuscitation
 - c. Patient sedation
 - d. Fluid management and need for blood products
 - e. Body temperature control
 - f. Caring for the patient after the heart catheterization with respect to:
 - g. Control of local hemostasis
 - h. Wound care
 - i. Fluid management and reinstatement of oral feeding
 - j. Need for blood transfusion
 - k. Indications for anticoagulation/thrombolysis therapy
 - l. Pain and emesis control
 - m. Need for antibiotic prophylaxis
 - n. Guidelines for discharge post- catheterization

<p>The fellow should master the technical ability to:</p> <ol style="list-style-type: none"> Obtain vascular access using the Seldinger technique in the femoral vein and artery of infants and children Manipulate a balloon-tipped catheter in the right heart, and obtain reliable pressure tracings and blood oxymetry samples Position the biplane angiography equipment effectively and safely Obtain adequate hemostasis after removal of introducers with no or minimal hematoma formation Perform a balloon atrial septostomy under the surveillance of an attending cardiologist Perform a percutaneous pericardiocentesis under the surveillance of an attending cardiologist <p>Objectives for the Senior Heart Cath Rotation</p> <p>To achieve this competency at the Senior Cath Fellow level the fellow must:</p> <ol style="list-style-type: none"> Consolidate the knowledge of the basic principles learned in the first three blocks of the heart cath rotation Acquire the knowledge of indications for percutaneous cardiac interventions and main complications associated with each intervention Be able to contrast/compare surgical and percutaneous interventions for congenital lesions Be knowledgeable of issues relating to transport of sick neonates/children to and from the heart cath lab Be aware of issues relating to the catheterization of neonates Formulate an accurate and meaningful interpretation of the data obtained during a heart catheterization Integrate data obtained from a heart catheterization into the overall assessment of the patient and reconcile contradictory information obtained at heart cath with other diagnostic modalities Formulate a therapeutic recommendation based on the results of the heart cath 	<p>Obtain percutaneous access and learn to manipulate the catheter inside the right and left heart under the supervision of the attending Assume more responsibilities in the cath lab as he/she gains more seniority</p>
<p>Role: Communicator</p> <p>To achieve this competency the fellow should demonstrate: Proficiency in explaining to parents and the patient (when appropriate) the indications, risks and potential complications of cardiac catheterizations Produce an accurate and concise catheterization report in a timely fashion Communicate effectively the results of the heart catheterization to parents and the child (when appropriate) Communicate effectively the results of the heart catheterization to other health care professionals</p>	<p>Observe then emulate oral communication techniques demonstrated by the attending cardiologist</p>

<p>Role: Collaborator</p> <p>To achieve this competency the fellow will demonstrate: An ability to work effectively with other health care professionals (nurses, technicians, other medical staff) throughout the process of preparation, completion and following the heart catheterization procedure Sensitivity to each team member's area of expertise in the cath lab</p>	<p>Participate at all activities of the heart cath team</p>
<p>Role: Manager</p> <p>To achieve this competency the fellow will demonstrate: An ability to use ancillary testing in an appropriate and cost-effective manner An ability to streamline the completion of the heart catheterization by coordinating the pre-cath and post-cath care Leadership skills in the cath lab that are appropriate for his/hers level of training An appreciation of the quality assurance process in the heart catheterization laboratory</p>	<p>Participate in the preparation and organization of the heart catheterization under the supervision of the attending cardiologist</p>
<p>Role: Health Advocate</p> <p>To achieve competency in this role the fellow is expected to demonstrate: Initiative in advocating for her/his patient at the institutional and societal level</p>	<p>Seek opportunities to advocate for the patient at the institutional and societal level Write essays on pertinent advocacy topics</p>
<p>Role: Scholar</p> <p>To attain this competency the fellow will demonstrate: Initiative and curiosity An ability to critically appraise medical literature Proficiency in maintaining a teaching portfolio and tracking clinical and academic encounters</p>	<p>Critically review literature in the setting of a Journal Club Give formal and informal presentations Seek opportunities to become involved in structured academic activities Maintain a log of clinical and academic activities</p>
<p>Role: Professional</p> <p>To attain this competency the fellow will demonstrate: An ability to practice medicine ethically Adequate interpersonal behavior Proficiency in acting as a consultant Sensitivity to patient-specific health issues in a way that will preserve dignity and privacy. Sensitivity to patient's racial, ethnic and cultural background An ability to be punctual</p>	<p>Emulate positive behavior in attending cardiologists Attend professionalism workshops when available</p>

Objectives for Electrophysiology Rotation

1. Able to read normal and abnormal Pediatric Electrocardiograms, including a good understanding of age related changes of the ECG
2. Obtain knowledge and logistical experience in ordering, applying and performing Holter tests, event recorder testing, exercise testing, pacemaker interrogation and interpretation (permanent) pacemaker interrogation and interpretation (temporary)
3. Assist with invasive electrophysiology studies including device implantation, device revisions and diagnostic and interventional ablation procedures
4. Learn about indications for TILT table testing and perform TILT table testing

Educational objectives for the electrophysiology rotation are directed toward teaching interpretation of ECG, Holter and event recordings. Understand the basic principles and components of an Electrophysiology study and device implantation. By the conclusion of this rotation the pediatric cardiology fellow will be able to accomplish the following items:

Basic Knowledge

1. Normal and abnormal ECG - and age related changes
2. Event recorders and their role in evaluation of palpitations
3. Able to read and interpret Holvers
4. Perform daily telemetry review
5. Learn about bedside temporary epicardial pacing

Pre-EP study / Device procedure / Tilt Testing

1. Obtain a pre-procedure history and physical examination
2. Order and collect and interpret pre-procedure laboratory data
3. Learn the risks of the electrophysiology procedures for neonates, infants, children and adolescents
4. Write appropriate pre-procedure orders including counseling and obtaining consent
5. Order age-appropriate pre-procedure sedation
6. Know the risks and benefits of electro physiologic testing
7. Know the risks and benefits ablation therapy (cryoablation / radiofrequency ablation)
8. Know the risks and benefits of device therapy

Procedure in EP laboratory

Tilt

1. Position and restrain the patient appropriately
2. Need / use Tilt table, BP cuff +/- venous access, central access, art line
3. Learn how data is documented using electrophysiology equipment

EPS

1. Position and restrain the patient appropriately
2. Perform sterile prep and drape
3. Obtain local anesthesia of the skin and subcutaneous tissues
4. Choose appropriately sized sheaths and catheters
5. Obtain femoral venous and arterial access in patients older than 6 months
6. Successfully position biplane cameras
7. Know indications for, and appropriate doses of, systemic heparin
8. Appreciate the normal course for venous and arterial catheters
9. Know the value of normal conduction intervals and how they can be obtained
10. Understand basic pacing maneuvers
11. Perform catheter removal and obtain hemostasis

Devices

1. Position and restrain the patient appropriately
2. Prepare arm for an anticipated venogram to evaluate patency of appropriate venous structures
3. Know indications and dosages for pre-procedure antibiotic prophylaxis
4. Learn indications for device implantation
5. Perform sterile prep and drape
6. Obtain local anesthesia of the skin and subcutaneous tissues
7. Choose appropriately sized sheaths for access
8. Obtain femoral access in preparation if patient is pacemaker dependent or has an unreliable escape rhythm
9. Know indications for, and appropriate doses of transthoracic pacing, cardioversion and defibrillation
10. Understand loss of capture and inappropriate sensing
11. Understand basic pacing maneuvers perform pocket closure / appropriate dressing application

Post procedure

1. Write age-appropriate post procedure orders
2. Know and anticipate common complications of the procedure including bleeding, venous and arterial thrombosis, and hematoma, stroke
3. Understand wound care post device implantation
4. Successfully discharge patient's post-procedure including post-procedure education
5. Dictate procedure reports
6. Dictate letters to referring physicians regarding procedure
7. Present and interpret data at Cardiology-CV Surgery Conference

<p>24. A knowledge of the indications for use of pacemakers in children</p> <p>25. A knowledge of complications relating to pacemaker therapy in children</p> <p>26. An ability to interrogate a pacemaker and to perform basic programming</p> <p>27. An ability to interpret pacemaker tracings</p> <p>28. An understanding of the role of temporary pacemaker use in the pediatric patient</p> <p>29. A knowledge of the indications and use of transcutaneous pacemakers and external defibrillators</p> <p>30. An understanding of the role of AICDs in pediatrics</p> <p>31. A detailed knowledge of PALS guidelines for resuscitation in children</p>	
<p>Communicator To attain this competency the fellow will demonstrate: An ability to clearly explain arrhythmia diagnoses to patients, their families and other health care professionals An ability to effectively explain the indications for EP investigations and convey results to patient, their families and other health care professionals Provide concise verbal and written reports of EP studies</p>	<p>Observe then emulate communication techniques demonstrated by attending cardiologist(s) Attend Department of Pediatrics wide workshops on communication skills Role play at fellow tutorials</p>
<p>Collaborator To attain this competency the fellow will demonstrate: An ability to work effectively as part of a team of health care professionals Sensitivity to each team member's area of expertise</p>	<p>Emulate positive interactions between the attending cardiologist and her/his team in the non-invasive and invasive EP laboratories</p>
<p>Manager To attain this competency the fellow will demonstrate: An ability to rationalize diagnostic and therapeutic resources Understanding of factors governing quality control An ability to prioritize resources (time, manpower, diagnostic and therapeutic facilities)</p>	<p>Attend Department of Pediatrics wide courses in Management Be given progressive latitude in coordinating the diagnostic evaluation of patients under her/his care Participate at departmental morbidity and mortality rounds Participate in divisional Quality Assurance meetings Coordinate the organization of specific academic activities</p>
<p>Health Advocate To attain this competency the fellow will demonstrate: Initiative in advocating for her/his patient at the institutional and societal level</p>	<p>Seek opportunities to advocate for the patient at the institutional and societal level Role play at fellow tutorial</p>

<p>Scholar To attain this competency the fellow will demonstrate: Initiative and curiosity An ability to critically appraise medical literature Proficiency in maintaining a teaching portfolio and tracking clinical and academic encounters</p>	<p>Critically review literature in the setting of a Journal Club Give formal and informal presentations Seek opportunities to become involved in structured academic activities Maintain a log of clinical and academic activities</p>
<p>Professionalism To attain this competency the fellow will demonstrate: An ability to practice medicine ethically Appropriate interpersonal behavior Proficiency in acting as a consultant Sensitivity to patient-specific health issues in a way that will preserve dignity and privacy. Sensitivity to the patient’s racial, ethnic and cultural background An ability to be punctual</p>	<p>Emulate positive behavior of attending cardiologists Identify a mentor by the beginning of the end of the first year of training Attend professionalism workshops when available Role play at fellow tutorials</p>

Objectives for the Adult Congenital Rotation

General considerations:

An increasing number of adults will require continual medical surveillance for residual congenital cardiac lesions. These patients are best served by an adult congenital heart clinic. Adult cardiologists with expertise in congenital heart disease evaluate patients in such clinics and then bring for discussion challenging cases to a forum composed of pediatric cardiologists, congenital cardiac surgeons and other related health care professionals. All pediatric cardiologists must therefore achieve a certain level of expertise in the evaluation of adults with congenital heart disease. The fellow will spend one block in Adult Congenital Unit where she/he will participate at the daily clinical activities.

<p>Medical expert To attain this competency the fellow will demonstrate:</p> <ol style="list-style-type: none"> 1. Knowledge of the natural and unnatural history of congenital cardiac malformations, the long-term outlook and possible complications. 2. Knowledge of the role and indications and limitations for the various investigative techniques used in adult congenital heart disease. 3. Understanding of the effects of pregnancy on the normal and abnormal cardiovascular system, and the risks and contraindications to pregnancy and contraception. 4. Understanding of the effects of cardiac malformations on other lifestyle issues 5. Knowledge of the Canadian Cardiovascular Society consensus conference on Adult Congenital Heart Disease 	<p>Learning strategies The fellow will: Read appropriate chapters in textbooks of cardiology and pediatric cardiology Attend CVT-cardiology conferences Attend clinics</p>
<p>Communicator To attain this competency the fellow will demonstrate:</p> <ol style="list-style-type: none"> 1. An ability to discuss with young adult patients the issues of pregnancy, contraception, genetics, exercise and sporting activities, employment and career choice, in the light of the patients disease process, social circumstances, intellect and personal aspirations. 2. An ability to summarize a patient's past medical history and communicate this information to other health care professionals involved in the care 3. An ability to generate accurate and succinct clinic letters in a timely fashion 	<p>Formally present patients at combined CVT-cardio conference Produce written reports of clinic visits Role play at fellow tutorials</p>

<p>Collaborator To attain this competency the fellow will demonstrate: An ability to collaborate with other health care professionals involved in the care of the Adult Congenital patient</p>	Attend multidisciplinary meetings
<p>Manager To attain this competency the fellow will demonstrate: 1. An ability to coordinate transfer of patient care and data to the adult congenital heart center. 2. An ability to rationalize resources in the investigation and treatment of adult congenital patients</p>	Participate in coordinating the diagnostic evaluation of patients seen in clinic
<p>Health Advocate To attain this competency the fellow will demonstrate: An ability to recognize issues which impact on the lifestyle of adolescents and young adults with congenital heart disease and be prepared to act as their advocate with authorities in order to promote their health and well-being and avoid discrimination against them.</p>	Seek opportunities to advocate for the Adult Congenital patient to other health care professionals at the institutional and societal level
<p>Scholar To attain this competency the fellow will demonstrate: 1. An ability to critically appraise literature pertaining to adult congenital heart disease 2. Interest and ability in teaching junior staff and allied health care professionals 3. Interest in participating in academic activities in this area</p>	Critically review literature pertaining to this area Give formal and informal presentations Become involved in structured academic activities in this area
<p>Professionalism To attain this competency the fellow will demonstrate: 1. An ability to practice medicine ethically 2. Adequate interpersonal behavior 3. Proficiency in acting as a consultant 4. Sensitivity to patient-specific health issues in a way that will preserve dignity and privacy. 5. Sensitivity to patient's racial, ethnic and cultural background 6. An ability to be punctual</p>	Emulate positive behavior in attending cardiologists Attend professionalism workshops when available

Objectives for the Cardiovascular Surgery (CVT) Rotation

General considerations:

This one block rotation is an essential experience given the close partnership between cardiology and cardiovascular surgery in the field of congenital heart disease. While on the CVT service, the cardiology fellow is fully integrated to the surgical team. As such, the fellow will closely interact with the CVT surgery fellow, perfusionist, and, when necessary, with the attending surgeon. She/he will evaluate patients pre-operatively, participate at the surgical intervention and follow patients in the post-operative period. The cardiology fellow should make a special effort to gain some exposure to basic principles in cardiac perfusion and anesthesia. The fellow is also expected to attend CVT outpatient clinics and interface appropriately with all members of the Cardiac Team. Call duties will be determined by the needs of the surgical service.

<p>Medical expert To attain this competency the fellow will demonstrate:</p> <ol style="list-style-type: none"> 1. An understanding of all major surgical operations for congenital heart disease, including indications, risks and post-operative morbidities 2. An understanding of basic principles of cardio-pulmonary bypass, including the physiology of blood flow and gas exchange in the pump circuit 3. An understanding of basic principles of pediatric cardiac anesthesia (including techniques of neuromonitoring during bypass) 4. Competence in completing a pre-operative evaluation 5. Competence in managing the surgical patient in the post-operative period 6. An ability to complete some basic thoracic surgery techniques such as chest tube insertion and removal, removal of epicardial pacing wires, and pericardiocentesis 	<p>Learning strategies The fellow will:</p> <ul style="list-style-type: none"> Read pertinent chapters in textbooks of pediatric cardiology and pediatric cardiac surgery Attend CVT-cardiology rounds Attend pertinent Cardiology or CVT conferences Observe operative surgical techniques Observe the work of the perfusionist Observe the work of the cardiac anesthetist Perform basic thoracic surgery techniques under the supervision of the cardiac surgery fellow and/or attending surgeon
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<p>Communicator To attain this competency the fellow will demonstrate:</p> <ol style="list-style-type: none"> 1. An ability to communicate effectively with patients and families in the perioperative period 2. An ability to communicate effectively with members of the Cardiac Team 3. A proficiency in writing concise and accurate progress notes in a timely fashion 	<p>Observe then emulate communication techniques demonstrated by attending surgeon Attend Department of Pediatrics wide workshops on communication skills (when available)</p>
<p>Collaborator To attain this competency the fellow will demonstrate:</p> <ol style="list-style-type: none"> 1. An ability to work effectively as part of a team of health care professionals 2. Sensitivity to each team member's area of expertise 	<p>Attend multidisciplinary meetings Interact closely with members of the Cardiac Team</p>
<p>Manager To attain this competency the fellow will demonstrate:</p> <ol style="list-style-type: none"> 1. An ability to rationalize diagnostic and therapeutic resources 2. Understanding of factors governing quality control 3. An ability to prioritize resources (time, manpower, diagnostic and therapeutic facilities) 	<p>Attend courses in Management Participate at departmental morbidity and mortality rounds</p>
<p>Health Advocate To attain this competency the fellow will demonstrate: Initiative in advocating for her/his patient at the institutional and societal level</p>	<p>Seek opportunities to advocate for the patient at the institutional and societal level</p>
<p>Scholar To attain this competency the fellow will demonstrate:</p> <ol style="list-style-type: none"> 1. Initiative and curiosity 2. An ability to critically appraise medical literature 3. Proficiency in maintaining a teaching portfolio and tracking clinical and academic encounters 	<p>Critically review literature in the setting of a Journal Club Give formal and informal presentations Seek opportunities to become involved in structured academic activities Maintain a log of clinical and academic activities</p>

<p>Professionalism</p> <p>To attain this competency the fellow will demonstrate:</p> <ol style="list-style-type: none">1. An ability to practice medicine ethically2. Adequate interpersonal behavior3. Proficiency in acting as a consultant4. Sensitivity to patient-specific health issues in a way that will preserve dignity and privacy.5. Sensitivity to patient's racial, ethnic and cultural background6. An ability to be punctual	<p>Emulate positive behavior in attending surgeon</p> <p>Attend professionalism workshops (when available)</p>
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TRAINEE EVALUATION

1. Evaluative feedback, verbal and written, to the trainee during the training period is vital in directing the trainee's progress.
2. It is essential to maintain adequate records to document each trainee's experience in performing the various procedures.
3. Evaluation of technical skills must be carried out by direct supervision of the trainee during the performance of procedures.
4. Evaluation of responsibility includes assessment of the thoroughness of preprocedural evaluation and clinical follow-up, reliability, and interpersonal interaction with patients, other physicians and laboratory staff.
5. Periodic meetings will be conducted with the trainee to provide structured evaluation.
6. The trainee will be also given the opportunity to give feedback about the program in general and about his/her mentors specifically.

Rotation Evaluation Report

Name of Fellow: ----- Rotation: -----

Name of Preceptor: ----- Period: -----

1: Below Expected Level 2: At Expected Level 3: Above Expected Level 4: Not Applicable

	1	2	3	4
Clinical Skills				
Elicits the history and obtains other relevant data from patients and conducts an appropriate physical examination.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Synthesizes findings from history and physical examinations to develop a differential diagnoses and management plans.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Plans and arranges investigations appropriately.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Medical Expertise				
Recognizes and manages critically ill patients.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Manages specific acute medical problems.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Manage patients with undifferentiated presentations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Patient Care and Therapeutics				
Manages general care in the unwell patient and facilitates ongoing care planning.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Prescribes appropriate and safe pharmacotherapy.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Manages patients with surgical problems.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Procedural Skills				
Competently performs relevant procedures.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Provides care following procedures.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Professional Qualities				
Applies communication skills to engage and reassure the patient and their families in specific situations and empowers patients while being respectful of their rights.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Uses evidence to inform quality improvement, optimizes safe work practices, and promotes safe continuity of care for patients.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Recognizes, reports on and manages adverse events and errors. Identifies, establishes, implements and/or complies with relevant risk-management/minimization procedures.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Has developed a sound professional standard of personal conduct and demonstrates the ability to critically reflect on personal beliefs, biases and behaviours, and their alignment with health care policy and impact on interaction with patients	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Additional Comments:

Declaration

Please tick to indicate that you declare:

- For the period covered in this report, I have been the Preceptor for the Fellow and provided educational support for him/her.

Preceptor's Comments:

I have/have not discussed this assessment with the Fellow, and make the following comments:

Name: ----- Signature: ----- Date: -----

Fellow's Comments:

I have/have not discussed this assessment with my Preceptor and make the following comments:

Name: ----- Signature: ----- Date: -----

Procedures

All fellows must maintain a logbook of clinical procedures performed, including whether the procedures were supervised. The following is the minimum number of procedures performed during the total fellowship period.

Procedure	Minimum
Ambulatory care: manage patients in an ambulatory care (outpatient) setting under supervision	300 patients
Balloon Atrial Septostomy: perform balloon atrial septostomy cases under supervision and demonstrate competency as an independent operator	5 cases
Cardiac Catheterization: perform and report cardiac catheterization and haemodynamics	100 cases
Cardiac Catheterization: perform and report cardiac catheterization as primary operator (included in total requirement of 100 cases)	20 cases
Direct Current Cardioversion: perform direct current cardioversion	5 cases
Echocardiograms: fetal echocardiograms (observation and associated counselling)	20 studies
Echocardiograms: transoesophageal echocardiograms <ul style="list-style-type: none"> • 25 studies as a primary operator • All studies should be reviewed and have finalized consultant reports 	50 studies
Echocardiograms: transthoracic echocardiograms <ul style="list-style-type: none"> • 300 under supervision of consultant pediatric cardiologist • At least 500 on patients with cardiac pathology • All studies should be reviewed and have finalized consultant reports 	600 cases
Electrocardiograms: interpret and report electrocardiograms on both inpatients and outpatients	
Electrophysiology: participate in clinical decision making for electrophysiology study/ablation procedure, including observation of procedures and interpretation of reports	10 cases
Exercise Tests: supervise and report exercise tests	50 cases
Holter Monitor: supervise and report Holter monitor	50 cases
Imaging: interpret chest x-rays	
Imaging: interpret results of cardiac MRI, thoracic CT and radionuclide imaging	10 (in total)
Pacemaker: observe pacemaker implantation	5 cases
Pacemaker: participate in testing permanent pacemaker function	20 cases
Pacemaker: perform pacemaker testing	20 cases
Pericardial Aspiration: perform pericardial under supervision and demonstrate competency as an independent operator	3-5 cases

**Pediatric Cardiology Fellowship Program
Chest Diseases Hospital
Kuwait**

Procedures

Monthly Summary:

Month and year -----

		<i>Principal / Unsupervised</i>	<i>Assistant / supervised</i>
Catheters:	Right Heart Catheterization		
	Left Heart Catheterization		
	R & L Heart Catheterization		
Interventions:	Balloon Atrial Septostomy		
	Pulm Valvuloplasty		
	Aort Valvuloplasty		
	Coarct Angioplasty		
	Closure PDA		
	Closure ASD		
	Coil Emb Collateral		
	Other (specify)		
ECG / Arrhythmia:	Holter reporting		
	Exercise testing		
	EP study / RF		
	DC Cardioversion		
	Pacemaker tests		
	Other (specify)		
Echocardiograms:	Transthoracic		
	TEE		
	Fetal		
Outpatient Clinics:			

Name of fellow: ----- Signed: ----- Date: -----

**Pediatric Cardiology Fellowship Program
Chest Diseases Hospital
Kuwait**

Log Book

Name:

Year of Training:

