

Cardiology Fellowship Manual

**Goals & Objectives
-Cardiac Intensive Care-**

CARDIAC INTENSIVE CARE ROTATION

I. General Information:

The cardiac intensive care rotation is a month long rotation taken a total of approximately three throughout the 3 year fellowship. The fellow is part of a team, which includes physicians (interns and residents, cardiologists, intensivists, neonatologists, and cardiovascular surgeons), nurses (cardiology nurse, bedside nurse, and charge nurse), and surgical midlevel providers (nurse practitioners / physician assistants). This team is responsible for:

- inpatients admitted to the intensive care unit, receiving either cardiac medical or surgical care;
- inpatient consults requested of the cardiology service in the intensive care unit

II. General Objectives:

The goal of the cardiac intensive care rotation is to equip the Pediatric Cardiology fellow to be able to evaluate and provide stabilization of the hemodynamically compromised pediatric patient with heart disease. Following the cardiac intensive care rotations, the cardiology fellow will be able to provide consultation to cardiac surgeons, intensivists, and neonatologists and others regarding medical and pre/postoperative management of pediatric patients with congenital heart disease.

The overall goal of the cardiac intensive care rotation is to prepare the fellows to become competent in the evaluation and treatment of critically ill neonates, infants, and older children/adults with structural or acquired heart disease.

Rotation Contacts

Faculty Supervisor(s)/Preceptor(s): Attending intensivist along with the attending cardiologist at the time of service. The cardiologist will be listed on Cardiology Service/Call schedule. The intensive care staff has a similar schedule.

Length of Rotation

- 1 month

Locations

- PICU and NICU

Prerequisites

- Vacation/time off is **not** allowed during this rotation.

General Responsibilities and Expectations

Schedule

- **CT surgery rounds** start in the PICU at 7:00 AM attended by the PICU team, the CV Surgery team, the Cardiology team, and other services as needed. These rounds are an essential part of the day as key plans requiring the input of the various other teams (e.g. Surgery, EP, or transplant) are determined at this time. **Other than the first week of their first rotation in cardiac intensive care, the fellows will be expected to lead these rounds when post-call and attend rounds while on service.** The fellows will be expected to be familiar with all cardiac cases in the intensive care unit. **It is critical for the fellow to proactively seek feedback from the PICU attending with whom they were on call for feedback on these presentations.**
- **Teaching Rounds** begin at 9:30 AM. Fellows will be expected to be familiar with all cardiac patients in the PICU and be able to lead the rounding discussion for each patient and formulate a summary management plan for the day for those patients.
- **Evening Rounds and Hand-off/check-out** are conducted every evening and the fellow will be responsible for understanding the plan and management for each cardiac patient in the PICU.
- **Long-term care rounds** are conducted weekly and the fellow will be responsible for attending, understanding the plan and management for each cardiac patient in the PICU. He/she will be expected to contribute with insight for the long term care of the cardiac patient in the PICU.
- **Cardiology Lecture series** is conducted weekly on Wednesdays at 1PM lasting 30-45 minutes. While the fellow will be expected to attend each of these, he/she will be responsible for **giving one of these in the second year and two of these in the third year** during his/her rotation. The assigned attending is expected to be present during this lecture.

Patient Responsibilities

- The fellows will be expected to assimilate and disseminate accurate and comprehensive information regarding the cardiac patients.
- Fellows will be expected to round with the PICU team and know all of the cardiac patients.
- Fellows will be responsible for the supervision and management of the care of the cardiac patients. **There will be a gradual elevation in the level of this responsibility placed upon the fellow with increased freedom in clinical care as felt appropriate by the attending intensivist and cardiologist.**
- The fellow will serve as the supervising physician for cardiac patients in the PICU with the residents reporting to the fellow.
 - **First year:** The fellow will be responsible for being familiar with the pertinent information including clinical history, anatomy, physiology, and rationale for management. This will include their care from admission until transfer or discharge from the PICU and as applicable, the NICU. Fellows will be responsible for the Cardiology consult note and review of pertinent medical records. They will document an appropriate assessment including differential diagnosis (if applicable)

and plan therapeutic and diagnostic interventions. They will also be responsible for the Cardiology daily note on these patients. Daily care and emergent needs of patients will be addressed primarily by them in consultation with the care team staff.

- **Second year:** In the second year, the fellow will be expected to contribute, to a greater extent, to the care of the critically ill cardiac patient including the diagnosis and management of hemodynamic and electrophysiologic derangement. They will be expected to contribute to the education of the residents and students.
- **Third year:** In the third year, the fellow will be expected to function nearly independently from a cardiology perspective in the care of the critically ill cardiac patient including the diagnosis and management of hemodynamic and electrophysiologic derangement including communication with the various contributors to care of the critically ill cardiac patient. They will be expected to contribute significantly to the education of the residents and students.

Weekly/monthly didactic schedules

- Fellows are required to attend the regularly scheduled required didactics and conferences. The schedule is available from the Program Coordinator.
- Fellows are expected to attend at least 80% of the didactic sessions, leaving exceptions for post-call and travel.

Night or weekend call

- Fellows will have in-house call during the month they are on the cardiac intensive care rotation. Fellows will manage in-house call issues of the cardiac patients in the PICU during their rotation working in conjunction with the resident on call. Fellows will average one call night out of every four nights (seven calls per month). They will be expected not to exceed any of the prescribed work hour rules as stipulated by the American College of Graduate Medical Education (ACGME).

Outpatient Continuity Clinics

- Will not be required of the fellow during the cardiac intensive care service rotation.

Educational Responsibilities and Expectations

- Fellows will be expected to develop proficiency in the performance of various diagnostic and therapeutic procedures, under the supervision of the intensive care and cardiothoracic surgery team. The procedures performed during these rotations may include:
 - Arterial line placement
 - Peripheral venous catheter placement
 - Central venous line placement
 - Intraosseous line placement
 - Bag-mask ventilation

- Endotracheal intubation
- Thoracentesis and chest tube insertion
- Pericardiocentesis and pericardial drain placement
- Cardiopulmonary resuscitation
- Temporary pacemaker wire removal
- Chest tube removal

Instructional Resources

- Recommended Reading: Anthony Chang's *Pediatric Cardiac Intensive Care* or *Critical Heart Disease in Infants and Children* by Nichols et al.
- Optional Reading and Viewing: literature search using search engines like PubMed and Ovid as necessary for most up to date evidence based care.

Educational Goals and Objectives

Patient Care – that is compassionate, appropriate, and effective.

By the end of this rotation, the first-year pediatric cardiology fellow will be able to:

- Perform various diagnostic and therapeutic procedures, under the supervision of the intensive care attending.
- Understand the management of all cardiac patients in the PICU and, as applicable, the NICU and follow their care from admission until transfer or discharge from the intensive care units.
- Keep track of the various details of the patients' cardiac studies (e.g. echo, ECG, telemetry findings, Holters, cardiac catheterization, CT/MRI, etc.)

By the end of the second rotation, the second year pediatric cardiology fellow will be able to:

- Perform various diagnostic and therapeutic procedures, with some supervision of the intensive care attending.
- Contribute meaningfully to the care of the critically ill cardiac patient including the diagnosis and management of hemodynamic and electrophysiologic derangement and follow their care from admission until transfer or discharge from the PICU and, as applicable, the NICU.
- Understand the details of the patients' cardiac studies (e.g. echo, ECG, telemetry findings, Holters, cardiac catheterization, CT/MRI, etc.) and how they coalesce to inform the patient's current clinical status and prognosis

By the end of the third rotation, the pediatric cardiology fellow will be able to:

- Perform various diagnostic and therapeutic procedures, with minimal supervision of the intensive care attending.
- Contribute to a greater extent to the care of the critically ill cardiac patient including the diagnosis and management of hemodynamic and electrophysiologic derangement and follow their care from admission until transfer or discharge from the PICU and, as applicable, the NICU.
- Understand the details of the patients' cardiac studies (e.g. echo, ECG, telemetry findings, Holters, cardiac catheterization, CT/MRI, etc.) and how they coalesce to inform the patient's current clinical status and prognosis

being able to easily explain these findings to patients, parents, and the medical team as necessary.

Medical Knowledge – Increase in established and evolving biomedical, clinical, and rotation-specific fund of knowledge.

By the end of this rotation, the first-year pediatric cardiology fellow will be able to:

- Demonstrate knowledge in the following areas:
 - Cardiopulmonary physiology, especially as it applies to cardiac patients in the ICU setting.
 - Cardiovascular pharmacology.
 - The relationship between cardiac structure, function, and clinical state.
 - Be able to describe anticipate, diagnose, and initiate treatment for common post-surgical/bypass issues as well as more specific complications that arise from specific cardiac surgeries and/or specific congenital heart defects.
 - Diagnosis and therapy of arrhythmias, especially those occurring in ICU patients.

In particular, the trainee should be familiar with the use of atrial and ventricular pacing leads or transesophageal electrocardiography for diagnosing and treating arrhythmias, and the diagnosis and therapy of junctional ectopic tachycardia.
 - Use of invasive and non-invasive hemodynamic, respiratory, and neurologic monitors in critically ill patients.
 - Airway management skills.
 - Provision of analgesia and sedation.
 - Conduction of cardiopulmonary resuscitation.
 - Commonly used modes of mechanical ventilation and their application in patients with heart disease.
 - Common complications that occur in cardiac patients in the ICU, and how they may be prevented and treated e.g. Acute renal failure, ischemic bowel etc.

The trainee should be familiar with factors that predispose to common postoperative complications (e.g., catheter-related sepsis, pathological thrombosis, surgically-induced heart block), appropriate diagnostic techniques, and therapy for these complications.
 - Familiarity with extracorporeal membrane oxygenation and other cardiac support systems.
 - Indications for, and general principles, for providing "end-of-life" or "palliative" care.
 - Effects of cardiopulmonary bypass on organ function.

By the end of the subsequent rotations, the second and third- year pediatric cardiology fellow will be able to:

- Demonstrate a broader and deeper knowledge and understanding in the areas listed above.

Practice-based Learning and Improvement – to investigate, evaluate, and improve own practices; and to appraise and assimilate scientific evidence.

By the end of these rotations, the pediatric cardiology fellow will be able to:

- Utilize evidence-based medicine to formulate a systematic method for patient evaluation and treatment with respect to cardiovascular diseases.
- Search online resources for current literature relevant to specific patient presentations.
- Develop familiarity with principles of Quality Improvement and to apply them to patient care practices.
- Present cases at M&M conferences in which they were involved in the provision of care.
- As the fellow progresses, he/she will be expected to incrementally increase in knowledge and proficiency of the above concepts and practices.

Interpersonal and Communication Skills – effective exchange of information.

By the end of these rotations, the pediatric cardiology fellow will be able to:

- Communicate effectively and precisely with ICU team members and member of other teams and services to ensure appropriate care for the patient.
- Demonstrate effective listening skills in relating to the patients, their families and other members of the cardiovascular health care team.
- Provide information effectively to patients and families by explaining complex disease states and treatments without medical jargon.
- Accurately record findings and assessments in the medical record.
- Communicate effectively with referring physicians and with special services for patient consultations.
- Use a problem-oriented approach to the formal presentation of patient data in which pertinent positive and negative exam findings, lab results, etc. are communicated in an organized fashion and linked to the specific diagnoses and problems of each patient.
- As the fellow progresses, he/she will be expected to incrementally increase in knowledge and proficiency of the above concepts and practices.

Professionalism – professional responsibilities, ethical principles, and sensitivity to patients.

During this rotation, the pediatric cardiology fellow will:

- Display a professional attitude in appearance, dependability, promptness, and work ethic.
- Adhere to patient privacy and confidentiality.
- Display sensitivity and compassion toward patients and their families.
- Conduct themselves with honesty, integrity, and sensitivity to their patient's and ICU team members.
- Be punctual and show a commitment to the needs of their patients over their own.

- Demonstrate appropriate respect for other health care professionals.

System-based Practice – effectively partnering within the larger context of health care and resources for optimal patient care.

By the end of this rotation, the 1st-year pediatric cardiology fellow will be able to:

- Describe their role on the multi-disciplinary team.
- Show respect for importance of other health care professionals involved in the care of cardiac patients.
- Describe the operation of the ICU and understand the roles of the various team members of the Children’s Hospital and Medical Center.
- List and describe various regulatory and financial parameters which guide clinical practice.

Demonstrate their ability to lead a multi-disciplinary team.

By the end of this rotation, the upper level pediatric cardiology fellow will be able to:

- Show respect for importance of other health care professionals involved in the care of patients.
- Demonstrate a greater ability to lead a multi-disciplinary team.
- Coordinate the care of patients on the cardiology service in the intensive care unit with respect to the roles of the various team members.
- Utilize the various regulatory and financial parameters which guide clinical practice and provide evidence of this practice.

“Work Product”

During the course of this rotation, pediatric cardiology fellow will log procedures performed during this rotation into as they occur.

Work Product Expectation:

Work Product should be submitted at the end of the rotation. The rotation is considered incomplete until the work product is received.

Methods of Evaluation and Feedback

1. Subjective assessment of fellow’s performance will be undertaken by preceptors’ evaluations of written patient consults/evaluations or progress notes, didactic presentations, and observations of the execution of skills relevant to the learning objectives of the rotation. The standard evaluation form will be used and discussed with the fellow at the end of the rotation and during the semi-annual meeting with the program director.
2. Feedback will be given on a regular basis as the fellow presents patients on rounds. The fellow should be proactive about seeking feedback from both the critical care as well as the cardiology staff.
3. The fellow will submit a rotation experience evaluation using the standard rotation evaluation form.