



جامعة الإمام عبد الرحمن بن فيصل  
IMAM ABDULRAHMAN BIN FAISAL UNIVERSITY  
كلية العلوم الطبية التطبيقية  
College of Applied Medical Sciences

# Cardiac Technology Program — Internship Manual —

2025-2026

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## MESSAGE FROM THE VICE DEAN OF TRAINING AFFAIRS

Internship period is considered the core of the academic journey, and the transitional phase from the theoretical learning to the practical application in institutions that might be the future working places. Therefore, the impression you leave at the hospital is crucial and taken into consideration with the GPA and other qualifications during recruitment. Employers usually seek commitment, morals, and ethics in their future employee through the training centers. Based on that, interns should take responsibility and demonstrate integrity and honesty. In addition to hard work, persistence, dedication, discipline, mutual respect, time, and instruction adherence. This will guarantee the obtainment of the intended outcomes, which will reflect an honorable image for the department and university. Moreover, serving the community and contributing to the development of this nation will be rewarded by Allah. Lastly, I pray for success and grant us loyalty and wisdom in decision making.

Sincerely,

**Vice Dean of Training Affairs**

## MESSAGE FROM THE HEAD OF CARDIAC TECHNOLOGY DEPARTMENT

Congratulations on reaching this important stage of your journey. Your internship year marks a meaningful transition from student to practicing cardiac technologist, and it is designed to strengthen your clinical competence, confidence, and professionalism.

This manual outlines the expectations, learning outcomes, and evaluation processes that will guide you throughout the year. You will be expected to take initiative, manage your clinical duties effectively, interpret diagnostic findings, and demonstrate increasing independence in patient care.

We are confident that this experience will be both rewarding and transformative. Wishing you a successful internship year and a strong start to your professional career.

Sincerely,

**Dr. Abrar Ibrahim Alnaimi**

*Assistant Professor of Cardiovascular Sciences  
Chairperson, Department of Cardiac Technology  
College of Applied Medical Sciences  
Imam Abdulrahman Bin Faisal University*

## CARDIAC TECHNOLOGY PROGRAM

### ***Introduction***

Cardiac technology is an allied health profession specifically focused on the diagnosis, to assist in the management of patients with cardiovascular disease. Cardiac Technology Specialists are highly skilled professionals qualified to provide patient care using diagnostic (Echo) technology, assisting with cardiac catheterization either diagnostically or through intervention, or by managing cardiac perfusion in open-heart surgery. The Cardiac Technology program at Imam Abdulrahman bin Faisal University, College of Applied Medical Sciences (CAMS) was established during the academic year 2008-2009. The program duration is four years, including the preparatory year, and is followed by an internship year in a variety of approved hospitals.

### ***Program Vision***

A leading program of academic excellence for cardiac technology education and research nationally and internationally.

### ***Program Mission***

Graduate cardiac technologists who are competent in evidence-based knowledge and practice, innovative research skills, and effective community service compatible with the best ethical values of the profession.

### ***Program Goals***

- Provide quality education, and continuously improve learning standards with the best clinical experience.

- Graduate qualified cardiac technologists of national and international standards to fulfil labor markets' needs.
- Promote scientific research in the field of cardiac technology.
- Maintain effective community service and partnership.

### ***Program Values***

- Excellence.
- Loyalty.
- Teamwork.
- Initiative.
- Responsibility.
- Transparency.
- Creativity.

### ***Program Graduate Attributes***

#### **1. Deep knowledge and intellectual breadth**

Graduates have comprehensive knowledge and understanding of the field of cardiac technology and have the ability to apply their knowledge in practice including in multi-disciplinary and/or multi-professional contexts.

#### **2. Critical thinking and problem solving**

Graduates are effective problem-solvers, able to apply critical and creative thinking to conceive innovative research ideas and responses to challenges.

#### **3. Teamwork and communication skills**

Graduates convey ideas and information effectively to a range of audiences for a variety of purposes and contribute in a positive and collaborative manner to achieving common goals.

#### **4. Professionalism and leadership readiness**

Graduates engage in a professional behavior and have the responsibility for continuous professional development and have the potential to take leadership roles in their chosen careers and communities.

#### **5. Intercultural and ethical competency**

Graduates are responsible and accountable citizens whose personal values and practices are consistent with the Islamic identity and values as responsible members of the society.

#### **6. Digital capabilities**

Graduates are well prepared for living, learning, and working in a digital society.

#### **7. Self-awareness and emotional intelligence**

Graduates are self-aware and reflective, flexible, and resilient, and have the capacity to accept and give constructive feedback, being able to act with integrity and take responsibility for their actions.

## CAREER OPPORTUNITIES

There is an increasing demand for cardiac technology graduates in hospitals and cardiac centers across the Kingdom. The career path for our graduates goes even beyond working only in health sector. Industry and Medical Device Innovation are promising and growing sectors where our graduates can have opportunities for employment. Education and Academia sector is also a potential career path especially for the highly talented graduates. Lastly, engagement in research and postgraduate programs can also play a role in enhancing our graduate's employability.



Hospitals



Industry



Research

## **CARDIAC TECHNOLOGY INTERNSHIP PROGRAM GENERAL DESCRIPTION**

The Cardiac Technology Internship Program is a 12 months program, that provides interns with the opportunity to apply the previously acquired knowledge and skills in real clinical settings. During the internship, interns will have the chance to learn about various cardiac diagnostic procedures, equipment, and technologies used in the cardiology field. They will have the chance to assist in the performance of ECGs, stress tests, echocardiograms, cardiac catheterization, and cardiac perfusion under the guidance of expert professionals. Interns will also have the chance to familiarize themselves with medical software and data management systems used in cardiac technology. They will learn how to analyze and interpret test results, document patient information, and prepare reports. Additionally, interns may be involved in research projects and quality improvement initiatives in the cardiac technology field if they succeed in showing punctuality, and interest. This could include data collection, analysis, and participation in multidisciplinary team meetings to discuss patient cases and treatment plans. By the end of the program, interns will have gained valuable practical experience in cardiac technology and improved their understanding of cardiac diagnostics, interventions, and patient care. Internship year can serve as a steppingstone towards a career in the field of cardiac technology, providing a strong foundation for further professional development.

## BEFORE STARTING YOUR INTERNSHIP ...

Before starting your cardiac technology internship program, here are a few instructions to keep in mind:

- 1. Cardiac Technology Basics:** Make sure you have a solid understanding of the anatomy and physiology of the heart, as well as common cardiovascular conditions and procedures. This foundation will help you succeed during your internship.
- 2. Rules and Regulations:** Make sure that you familiarize yourself with rules and regulations of the internship program mentioned in this manual, and training rules and regulations of each hospital you have a rotation in.
- 3. Orientation Programs:** Attend all necessary orientation programs on different levels.
  - 3.1. Program Level:** This orientation program is organized by internship coordinator from cardiac technology department.
  - 3.2. Collage Level:** This orientation program is organized by CAMS training affairs.
  - 3.3. Hospital Level:** Each hospital/training site will be responsible to notify you by the dates of hospital orientation programs that should be conducted regularly for new employees and interns.
- 4. Dress Code and Appearance:** Find out the dress code requirements for the hospital/training site according to their rules and regulations. Dress professionally and maintain a neat appearance. It's important to project a positive and responsible image in a healthcare setting.
- 5. Punctuality and Attendance:** Be punctual and reliable. Arrive on time every day and inform your supervisor if you're unable to attend due to unforeseen circumstances. Consistent attendance demonstrates your commitment and reliability.
- 6. Communication Skills:** Develop good communication skills, both verbal and written. Clear communication with patients, supervisors, and fellow healthcare professionals is crucial in providing quality patient care and enhancing your internship experience.

- 7. Professional Conduct:** Maintain a high level of professionalism throughout the internship. Respect patient confidentiality, adhere to ethical standards, and always prioritize patients' well-being. Strive to be courteous, empathetic, and respectful to everyone you encounter.
- 8. Take Initiative:** Show initiative and eagerness to learn. Actively seek opportunities to expand your knowledge and skills. Offer assistance when needed, and ask questions to deepen your understanding.
- 9. Safety Protocols:** Familiarize yourself with the safety protocols specific to your hospital/training site. Pay attention to infection control measures, use personal protective equipment (PPE) as required, Environmental safety and emergency plans, and follow established procedures to ensure the well-being of both patients and yourself.
- 10. Documentation Accuracy:** Develop good documentation skills. Accurate and thorough documentation is essential for patient care and serves as a legal record. Pay attention to detail and ensure your documentation reflects patient information accurately.
- 11. Teamwork and Collaboration:** Embrace teamwork and collaboration with other healthcare professionals. Respect the expertise of others and communicate effectively to provide comprehensive patient care. Take advantage of opportunities to learn from experienced professionals in your field.
- 12. Continual Learning:** Approach the internship program as an opportunity for continual learning. Stay curious, stay updated with the latest medical advancements, and seek feedback from your supervisors to further improve your skills.

Remember, the internship program is an excellent avenue for practical learning and professional growth. Embrace the experience, be proactive, and make the most of this opportunity to enhance your knowledge and skills in cardiac technology.

## AREAS FOR INTERNSHIP ROTATIONS

### *Shared Rotation for all Subspecialties*

#### **1. Non-invasive (ECG, Holter, BP monitoring, and Stress test) Rotation**

The non-invasive rotation focuses on various diagnostic procedures used in cardiac technology, and it provides interns with hands-on experience in performing and interpreting electrocardiograms (ECGs), Holter monitoring, ambulatory blood pressure monitoring, and stress tests.

**Duration:** 3 months for both Cardiac Catheterization and Echocardiography interns.

**In this rotation interns will apply their acquired knowledge, skills, and values to:**

1. Perform ECGs and learn how to properly operate different ECG machines, and execute troubleshooting whenever is needed.
2. Assist in different types of stress tests such as treadmill stress test, and dobutamine stress test. The assistance including patient preparation, suggest suitable stress test protocols, monitor patients' vital signs during the procedure, and help with the interpretation of the test results.
3. Hook Holter Monitor, and Blood Pressure monitoring devices for patients.
4. Analyze and report Holter Monitor, and Blood pressure results.
5. Use various medical software and data management systems to book appointments, analyze, and report tests.
6. Communicate appropriately with patients by explaining different procedures and required instructions.
7. Be an effective and responsible team member.



## ***Invasive Technology (Cardiac Catheterization) Rotations***

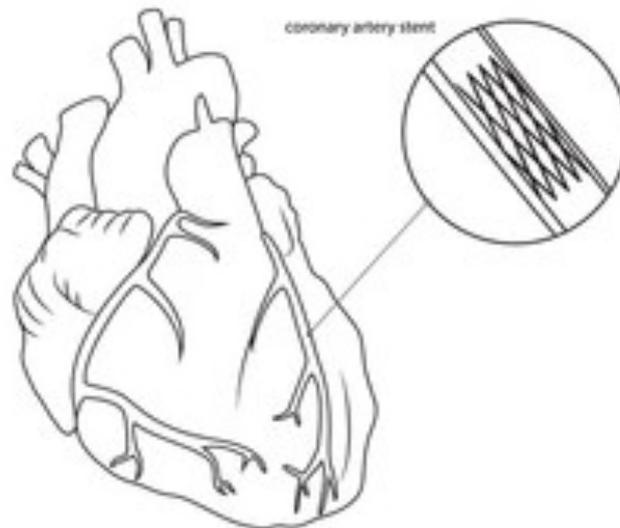
### **2. Adult Cardiac Catheterization I Rotation**

This rotation provides Cardiac Catheterization interns with the opportunity to gain experience in diagnostic and interventional cardiac catheterization procedures for adult patients. During this rotation, Cardiac Catheterization interns will be exposed to a variety of procedures, such as diagnostic coronary angiography, percutaneous coronary intervention (PCI) including balloon angioplasty, stent placement, structural procedures, and other adjacent procedures.

**Duration:** 3 months for Cardiac Catheterization interns.

**In this rotation interns will apply their acquired knowledge, skills, and values to:**

1. Prepare patients for cardiac catheterization and assist interventionalists as scrubbing assistant, by sterilizing the area around the puncture site, and preparing Cath table with the necessary tools and medications.
2. Closely monitor and record patients' blood pressure and heart rhythm with special hemodynamic monitoring equipment during the invasive procedures and notify the physician about any hemodynamic changes noted.
3. Assist in obtaining angiographic views, performing physiological and anatomical assessment to reach diagnosis and plan intervention if needed.
4. Write a preliminary report of the angiographic findings and interventional data.
5. Be familiar with invasive hemodynamic monitoring, arterial lines, intravenous lines, medications, patients transfer techniques, and the interpretation of lab results necessary before performing cardiac catheterization.
6. Develop essential communication skills in working with patients and their families during stressful situations. Interns will learn to provide emotional support and education to patients regarding their conditions and treatment plans.
7. Work closely with Cath lab team, including interventionalist, nurses, radiographers, and healthcare professionals.



### **3. Adult Cardiac Catheterization II Rotation (Electrophysiology)**

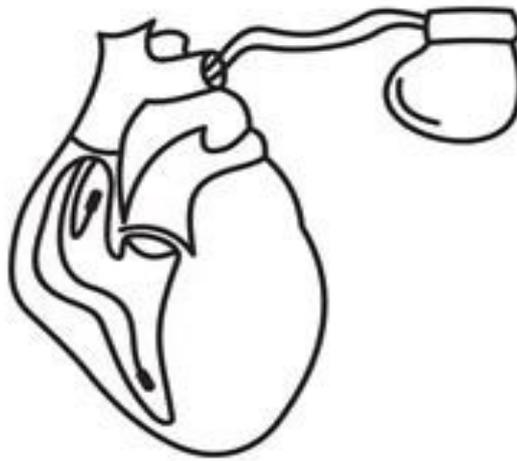
This rotation provides Cardiac Catheterization interns with the opportunity to observe and participate in Cardiac electrophysiology studies, ablation, implantation of pacemakers and defibrillators, and cardiac mapping.

**Duration:** 3 months for Cardiac Catheterization interns.

**In this rotation interns will apply their acquired knowledge, skills, and values to:**

1. Prepare patients for cardiac electrophysiology studies and assist electrophysiologists as scrubbing assistant, by sterilizing the area around the puncture or pocket site and preparing Cath table with the necessary tools and medications.
2. Closely monitor and record patients' blood pressure and heart rhythm with special hemodynamic monitoring equipment during the cardiac electrophysiology procedures and notify the electrophysiologist about any hemodynamic changes noted.
3. Assist in obtaining angiographic views, record and analyze cardiac electrophysiology tracings, setup implemented devices, and follow-up care.
4. Contribute to program pacemakers and implanted devices for optimal function under the supervision of the attending cardiologist.
5. Write a preliminary report of the cardiac electrophysiology study or device implantation procedures.
6. Develop essential communication skills in working with patients and their families. Interns will learn to provide education to patients regarding their conditions and treatment plans.

7. Work closely with Cath lab team, including electrophysiologists, nurses, radiographers, and healthcare professionals.



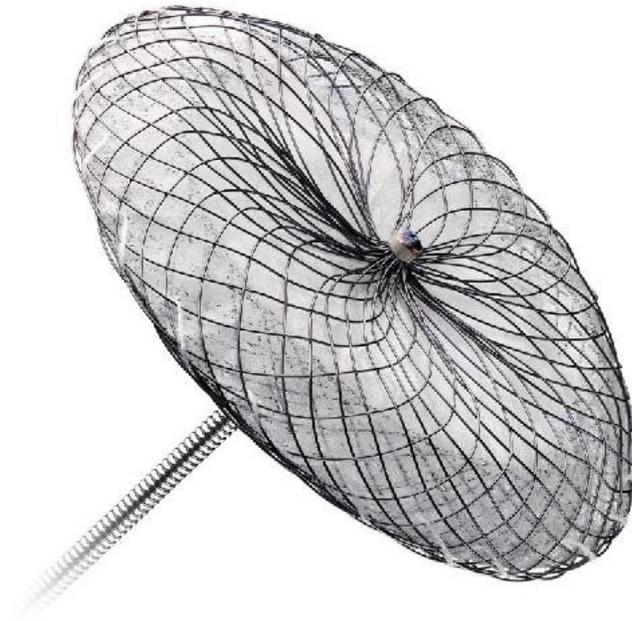
#### **4. Pediatric Cardiac Catheterization Rotation**

This rotation allows Cardiac Catheterization interns to develop a solid foundation in the assessment and management of pediatric cardiac conditions using invasive techniques.

**Duration:** 3 months for Cardiac Catheterization interns.

**In this rotation interns will apply their acquired knowledge, skills, and values to:**

1. Prepare pediatric patients for cardiac catheterization and assist interventionalists as scrubbing assistant, by sterilizing the area around the puncture site, and preparing Cath table with the necessary tools, defects closure devices, and medications.
2. Assist in obtaining angiographic views, record and analyze pressure tracings, oxygen levels, and collect blood samples from different parts of the heart.
3. Perform pressure measurements by applying specific equations in right heart catheterization.
4. Develop essential communication skills in working with patients and their families. Interns will learn to provide education to patients regarding their conditions and treatment plans.
5. Work closely with Cath lab team, including interventionalists, intensivists, anesthesia team, nurses, radiographers, and healthcare professionals.



### Summary

Rotation	Duration	Area/Unit
Adult Cardiac Catheterization I	3 months	Cath Lab
Adult Cardiac Catheterization II (Electrophysiology)	3 months	Cath Lab
Pediatric Cardiac Catheterization	3 months	Cath Lab
Non-invasive (ECG, Holter, BP monitoring, and Stress test)	3 months	ECG Lab

## ***Noninvasive Technology (Echocardiography)***

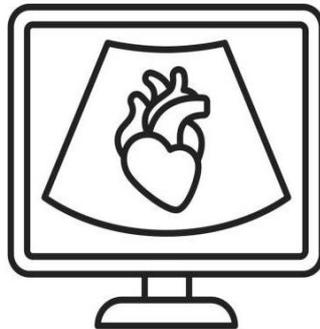
### **2. Adult Echocardiography I Rotation**

This rotation allows echocardiography interns to assess the structure and function of the heart in adult patients using echocardiography, as a non-invasive imaging technique. During this rotation, echocardiography interns work alongside experienced cardiologists and echocardiographers to gain practical experience in performing and interpreting echocardiograms.

**Duration:** 3 months for Echocardiography interns.

**In this rotation interns will apply their acquired knowledge, skills, and values to:**

1. Perform a cardiac ultrasound imaging scan of adult patients, using multiple views to scan the heart.
2. Obtain basic and advanced heart structure and function parameters relevant to adult patients' pathological condition.
3. Evaluate the findings to identify and grade the severity of a spectrum of heart diseases.
4. Write a preliminary report of the heart structure and function.
5. Select appropriate equipment settings and changing the patient's position as necessary.
6. Assist cardiologists in performing stress and transesophageal echocardiography procedures if requested.
7. Develop essential communication skills in working with adult patients.
8. Work closely with a multidisciplinary team, including cardiologists, nurses, and other healthcare professionals.



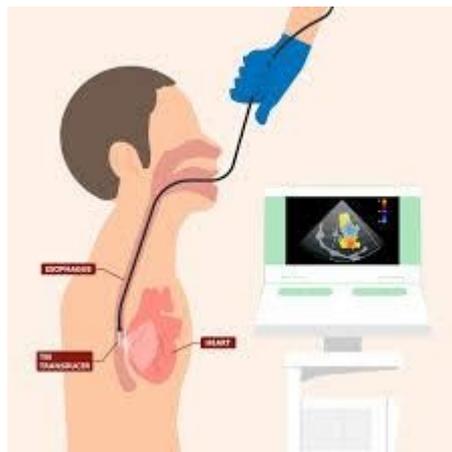
### **3. Adult Echocardiography II Rotation**

This rotation allows echocardiography interns to assess the structure and function of the heart in adult patients using trans-esophageal echocardiography (TEE), as a safe invasive imaging modality and use the stress TTE as a non-invasive echo modality to assess the function and regional wall motion abnormalities. During this rotation, echocardiography interns work alongside experienced cardiologists and echocardiographers to gain practical experience in performing and interpreting echocardiograms.

**Duration:** 3 months for Echocardiography interns.

**In this rotation interns will apply their acquired knowledge, skills, and values to:**

1. Perform a cardiac ultrasound imaging scan of adult patients, using multiple views to scan the heart.
2. Obtain basic and advanced heart structure and function parameters relevant to adult patients' pathological condition.
3. Evaluate the findings to identify and grade the severity of a spectrum of heart diseases.
4. Select appropriate equipment settings and changing the patient's position as necessary.
5. Assist cardiologists in performing stress and transesophageal echocardiography procedures.
6. Assist operators in contrast echo modality.
7. Develop essential communication skills in working with adult patients.
8. Work closely with a multidisciplinary team, including cardiologists, nurses, and other healthcare professionals.



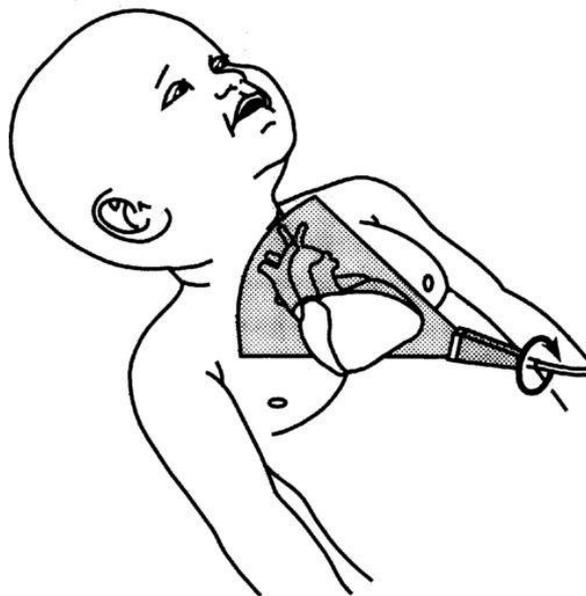
#### **4. Pediatric Echocardiography Rotation**

This rotation allows echocardiography interns to assess the structure and function of the heart in pediatric patients using echocardiography, as a non-invasive imaging technique. During this rotation, echocardiography interns work alongside experienced pediatric cardiologists and pediatric echocardiographers to gain practical experience in performing and interpreting pediatric echocardiograms.

**Duration:** 3 months for Echocardiography interns.

**In this rotation interns will apply their acquired knowledge, skills, and values to:**

1. Perform a cardiac ultrasound imaging scan of pediatric patients, using multiple views to scan the heart.
2. Obtain basic and advanced heart structure and function parameters relevant to pediatric patients' pathological condition.
3. Evaluate the findings to identify and grade the severity of a spectrum of congenital and acquired heart diseases.
4. Write a preliminary report of the heart structure and function.
5. Select appropriate probe, equipment settings, and changing the patient's position as necessary.
6. Develop essential communication skills in working with pediatric patients, and guardians.
7. Work closely with a multidisciplinary team, including cardiologists, nurses, and other healthcare professionals.



**Summary**

<b>Rotation</b>	<b>Duration</b>	<b>Area/Unit</b>
Adult Echocardiography I	3 months	ECHO Lab
Adult Echocardiography II	3 months	ECHO Lab
Pediatric Echocardiography	3 months	ECHO Lab
Non-invasive (ECG, Holter, BP monitoring, and Stress test)	3 months	ECG Lab

## ***invasive Technology (Cardiac Perfusion)***

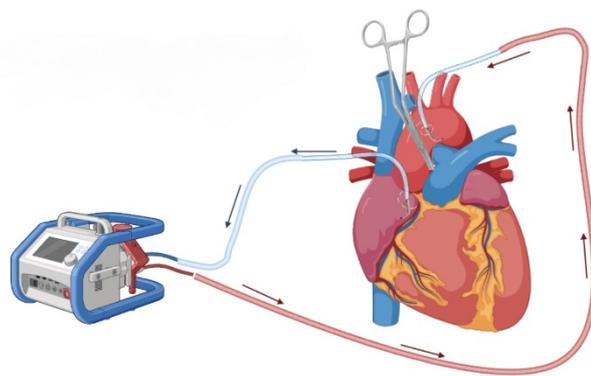
### **2. Cardiac Perfusion I Rotation**

This rotation allows cardiac perfusion interns to gain hands-on experience in operating the heart-lung machine during adult cardiac surgeries. Throughout this rotation, interns work alongside certified perfusionists and cardiac surgeons to understand the essential components of cardiopulmonary bypass (CPB), patient monitoring, and intra-operative perfusion management.

**Duration:** 3 months for Cardiac Perfusion interns

**In this rotation interns will apply their acquired knowledge, skills, and values to:**

1. Perform comprehensive pre-bypass verification and independently set up and prime standard CPB circuits.
2. Operate the heart–lung machine under supervision, maintaining appropriate flow, pressure, temperature, and oxygenation according to the patient’s physiological needs.
3. Monitor and record hemodynamic parameters, blood gases, laboratory values, and anticoagulation status throughout bypass.
4. Understand and apply pharmacological agents used during CPB, including anticoagulants, vasopressors, vasodilators, and cardioplegia solutions.
5. Assist in delivering cardioplegia and managing myocardial protection strategies during adult cardiac surgery.
6. Develop essential communication skills in working with pediatric patients, and guardians.
7. Work closely with a multidisciplinary team, including cardiologists, nurses, and other healthcare professionals.



### **3. Cardiac Perfusion II Rotation**

This rotation allows Cardiac Perfusion interns to refine their perfusion skills by participating in more complex adult cardiac surgery cases and gaining deeper understanding of specialized perfusion techniques. Interns will gain experience in hemodynamic management, advanced monitoring modalities, and mechanical circulatory support systems.

**Duration:** 3 months for Cardiac Perfusion interns.

**In this rotation interns will apply their acquired knowledge, skills, and values to:**

1. Perform comprehensive pre-bypass verification and independently set up and prime standard CPB circuits.
2. Operate the heart–lung machine under supervision, maintaining appropriate flow, pressure, temperature, and oxygenation according to the patient’s physiological needs.
3. Monitor and record hemodynamic parameters, blood gases, laboratory values, and anticoagulation status throughout bypass.
4. Participate in advanced CPB techniques, including hypothermic circulatory arrest and complex reoperation cases.
5. Independently set up, initiate, and manage VA-ECMO and understand protocols for patient transport and device safety.
6. Demonstrate proficiency in myocardial protection by preparing and administering different types of cardioplegia solutions based on surgical needs.
7. Develop essential communication skills in working with pediatric patients, and guardians.
8. Work closely with a multidisciplinary team, including cardiologists, nurses, and other healthcare professionals.

#### **4. Pediatric Cardiac Perfusion Rotation**

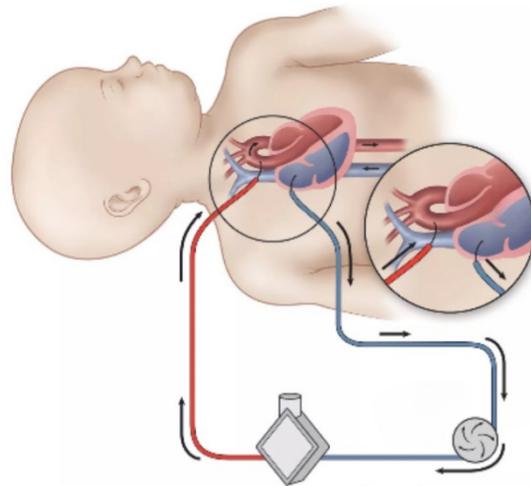
This rotation provides cardiac perfusion interns with essential hands-on experience in pediatric cardiopulmonary bypass for infants and children undergoing congenital heart surgery. Interns will learn specialized pediatric perfusion strategies that require precise management of blood flow, temperature, hemodilution, and oxygenation.

**Duration:** 3 months for Cardiac Perfusion interns.

**In this rotation interns will apply their acquired knowledge, skills, and values to:**

1. Prepare pediatric perfusion circuits and perform safety checks specific to neonatal and pediatric CPB requirements.
2. Assemble and prime the heart–lung machine while ensuring appropriate selection of circuit size, oxygenators, and tubing for pediatric patients.
3. Operate the CPB machine under supervision by maintaining suitable flows, pressures, temperatures, and oxygenation levels tailored to pediatric physiology.
4. Monitor and record hemodynamic parameters, blood gases, laboratory values, and anticoagulation status throughout bypass.
5. Assist in myocardial protection strategies by preparing and administering pediatric cardioplegia solutions as directed by the surgical team.

6. Recognize and respond appropriately to changes in patient status, equipment function, and perfusion needs during bypass.
7. Develop essential communication skills in working with pediatric patients and their caregivers, offering reassurance and support as appropriate.
8. Work closely with a multidisciplinary team including perfusionists, cardiologists, cardiac surgeons, anesthesiologists, nurses, and other healthcare professionals.



Rotation	Duration	Area/Unit
Adult Cardiac Perfusion I	3 months	OR / Perfusion Unit
Adult Cardiac Perfusion II	3 months	OR / Perfusion Unit
Pediatric Cardiac Perfusion	3 months	OR / Perfusion Unit
Non-invasive (ECG, Holter, BP monitoring, and Stress test)	3 months	OR / Pediatric Perfusion Unit

## **RULES AND REGULATIONS**

### **1. Internship Training Administrative Structure**

- 1.1. Internship training is directed and supervised by the Vice Dean for Training Affairs and at least one representative from each academic department.
- 1.2. Department representative for internship affairs is assigned by the Chairman of the respective department.

### **2. Admission Requirements**

- 2.1. To be admitted to the College of Applied Medical Sciences Internship training program, the intern must be an IAU, Applied Medical Sciences College graduate who has satisfied all the graduation requirements, and graduation has been approved by the Faculty Board.
- 2.2. Graduates from other recognized Allied Medical Sciences Colleges may be accepted upon approval from Vice Dean for Training Affairs and Faculty Board. Acceptance is contingent to availability of training positions.
- 2.3. Provided that the above requirements are met, priority of admission to internship training program will be as follows:
  - 2.3.1. IAU-College of Applied Medical Sciences College Graduates.
  - 2.3.2. Graduates from other Saudi Universities.
  - 2.3.3. Graduates from non-Saudi Universities.
- 2.4. All interns must pass the medical examination and have the required vaccinations as required by each academic department.

### **3. Training Period**

- 3.1. The duration of the program is one continuous year.
- 3.2. Interns training commences at the beginning of new academic year or on date approved by the Vice Dean for Training Affairs.

#### **4. Training Sites**

- 4.1. Internship training is conducted at recognized governmental or private institutions.
- 4.2. Training sites are determined by respective academic departments based on criteria ensuring the highest standards.

#### **5. Training Program Requirements**

- 5.1. Internship training is conducted through rotations/sections specific for each specialty as determined by respective academic departments.
- 5.2. Interns are required to follow affiliate institution working hours and meet the internship affairs minimum required working hours of 8 hours a day, 5 days a week.
- 5.3. An internship manual is prepared by each academic department to include requirements, rules and regulations, and evaluation forms specific to each specialty. The internship manual is updated on regular basis.
- 5.4. Interns are required to perform duties as assigned to them by supervisors and staff at the training sites.
- 5.5. Rotations are scheduled in such a way that it meets IAU requirements for Internship training.
- 5.6. Interns must abide by the approved Internship training rules and regulations of IAU – College of Applied Medical Sciences, and rules and policies set by the institution.
- 5.7. Visits to training sites are scheduled to make sure that training is conducted as planned.

#### **6. Attendance/Leaves/Vacations**

- 6.1. Interns are entitled to official vacation days (Eid Aladha, Eid AlFitr, the National day, and the Foundation Day).

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- 6.2. Start and end of vacations are determined by the Vice Dean for Training Affairs in an official correspondence with institutions and interns.
  - 6.3. Sick leaves can be exceptionally granted, provided that legitimate medical report is submitted.
  - 6.4. Sick leaves of more than two days during one rotation must be compensated.
  - 6.5. All leaves of 25% or more of rotation period will result in repeating the entire period of the rotation.
  - 6.6. Interns must sign in and out attendance sheet, or time-keeping schedule.
  - 6.7. Frequent tardiness may result in the followings disciplinary actions:
    - 6.7.1. Written warning letter.
    - 6.7.2. Repeating part of the rotation.
    - 6.7.3. Repeating the entire rotation.
  - 6.8. Interns may attend symposium/workshops related to their specialty, and time is counted towards training period provided that:
    - 6.8.1. Attendance does not affect continuity of training.
    - 6.8.2. Approval from training site.
    - 6.8.3. Approval from Vice Dean for Training affairs after reviewing scientific program of the symposium.
    - 6.8.4. Submission of attendance certificate.

## **7. Evaluation and Certification**

- 7.1. Interns' performance is assessed at the conclusion of each rotation using standards evaluation Form designed by respective academic departments.
  - 7.2. Evaluation of intern's performance is done by a person who has been directly supervising the intern at the training site.
  - 7.3. Evaluation reports are to be submitted to the Vice Dean for Training Affairs.
  - 7.4. Unsatisfactory performance in particular rotation period requires repeating that rotation.
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- 7.5. Satisfactory performance is defined as grade GOOD or better.
- 7.6. Interns who have satisfactorily completed the Internship training period (1 year) will be granted a Certificate of Completion.

## APPENDICES

## APPENDIX 1

### Form 1. CONFIDENTIALITY STATEMENT FORM

By signing below, I agree to comply with the following terms during my training period as an intern:

1. To maintain the confidentiality and privacy of all patients and employees as well as all confidential information of the training institution.
2. To perform my job and assigned tasks with honesty and loyalty according to professional rules and ethics consistent with the rules and regulations of the assigned training institution.
3. To adhere to professional ethics when dealing with colleagues, preceptors, department heads and all co-workers at the institution always during my training period.
4. I will not request any change in my internship training plan after finalization of the internship program plan.
5. I am fully responsible of reading, understanding, and following the rules and guidelines of the internship year and other administrative forms and procedures as clarified in the internship manual.

I have read and understood the above terms and agree to be restricted by them:

<b>Student name</b>	
<b>Student ID</b>	
<b>Date</b>	
<b>Signature</b>	

## APPENDIX 2

### Form 2. INTERNSHIP REQUIREMENTS CHICKLIST FORM

<b>Student name</b>		<b>Student ID</b>	
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Document Required	
	1. Received an Electronic version of Internship manual.
	2. Prepared a copy of a valid National ID / Iqama.
	3. Prepared a copy of a valid Passport.
	4. Prepared a copy of recent bank statement that includes student's name and IBAN number.
	5. Prepared a signed copy of Confidentiality statement (Appendix 1).
	6. Prepared a signed copy of hospital / rotation selection form (Appendix 3).
	7. Prepared a signed copy of
<p><b>These documents were received and approved by cardiac technology internship coordinator:</b></p> <p><b>Internship Coordinator Name:</b></p> <p><b>Signature:</b></p>	

## APPENDIX 3

### Form 3. HOSPITAL / ROTATION SELECTION FORM

<b>Student name</b>		<b>Student ID</b>	
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• Please write hospital name / rotation according to your preference ...		
Order	Hospital / Rotation	City
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

**Important notes:**

1. Fulfillment of students' preference depends on the availability of training opportunities in hospitals.
2. There must be at least one rotation in one of the approved governmental hospitals.
3. When sorting the requests, priority will be given to fulfil the students' preference based on cumulative GPA.
4. No request to change Hospital/ Rotation will be accepted after the final internship schedule is issued.

<b>Signature</b>		<b>Date</b>	
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## APPENDIX 4

### Form 4. GRADUATE INFORMATION FORM

Student Name (Identical to what is written in the passport, for studying abroad purposes)									
Language	First Name	Father Name	Grandfather Name	Family Name					
Arabic									
English									
Student University ID									
Birthplace									
Country:					City:				
Birthdate									
Hijiri:					AD:				
National ID Information									
Type	National ID <input type="checkbox"/>				IQAMA <input type="checkbox"/>				
National ID Number									
Issue Place	Country:				City:				
Issue Date	Hijiri			AD					
Expiry Date	Hijiri			Hijiri					
Contact Information									
Mobile Number									
Phone Number									
Email									
Signature						Date			



## APPENDIX 6

### Form 6. APPLICATION FOR EMERGENCY LEAVE FORM

<b>Date Submitted</b>	
<b>Intern Name:</b>	
<b>Intern University ID:</b>	
<b>Specific Reasoning</b>	
<b>From</b>	
<b>To</b>	
<b>Hospital Name</b>	
<b>Name &amp; Signature of Person in Charge</b>	

**Please Fax this form to: 013 – 8572872**

<u><b>For University official Use ONLY</b></u>	
<b>Intern to compensate leave:</b>	<b>YES: _____ NO: _____</b>
<b>Revised</b>	<b>Approved</b>
_____ <b>Coordinator Cardiac Technology Internship Training IAU</b>	_____ <b>Vice Dean for Training Affairs IAU</b>

## APPENDIX 7

### Form 7. INTERNSHIP COMPETENCIES CHECKLIST FORMS

#### Cardiac Technology Department Internship Non-Invasive Competencies

<b>Student Name</b>		<b>ID#</b>		<b>Training Institute Name</b>		<b>Preceptor Name</b>		<b>Sign.</b>	
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Item	Achieved	Not Achieved	Preceptor Signature
<b>GENERAL GUIDELINES, POLICIES AND PROCEDURES</b>			
<ul style="list-style-type: none"> <li>• Hospital Chart, Mission, Vision &amp; Values</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Review and adhere to policies and procedures</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Work attendance ethics</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Reprint labels</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>NON-INVASIVE LAB</b>			
<ul style="list-style-type: none"> <li>• Read and understand Laboratory Safety Policies and Procedures</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Read, use and locate Safety Data Sheet (SDS)</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Safe handling of the echo machines, equipment, and probe</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	

Item	Achieved	Not Achieved	Preceptor Signature
<ul style="list-style-type: none"> <li>Personal Protective Equipment (PPE)</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Emergency Codes</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>PATIENT PREPARATION</b>			
<ul style="list-style-type: none"> <li>Consent in EST</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Explanation of the procedure in different NI techniques.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Patient exposure (expose area of interest till the waist)</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Patient positioning: Demonstrate ability to position patients ensuring satisfactory recording.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Attach ECG electrodes: Demonstrate correct placement of ECG electrodes.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Enter patient demographic details</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li><b>BLS and ACLS</b></li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>12 LEAD ECG</b>			
<ul style="list-style-type: none"> <li>Know the principles of electrocardiography and the use of instruments to acquire, display, and store ECGs.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Know the normal values for electrical axis and ECG intervals and voltage.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Demonstrate correct cleaning, storage and restocking of ECG machine.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Work under supervision.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Demonstrate procedure for reporting malfunctioning of equipment.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Demonstrate accuracy in labelling recordings with Name, Date, Time, and any additional observations.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Demonstrate understanding of and appropriate use of machine settings i.e. gain, paper speed etc.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>State procedure for storing completed recordings as per department policy.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Ensures ECG recordings are shown to senior for review.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Recognize and troubleshoot types of artefacts.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Technical skill to interpret standard 12-lead ECG tracings and to incorporate the findings in patient care.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Technical skill to interpret Tachyarrhythmias.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Technical skill to interpret Bradyarrhythmia.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Technical skill to interpret IHD.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	

Item	Achieved	Not Achieved	Preceptor Signature
<ul style="list-style-type: none"> <li>Technical skill to interpret Pacemaker ECG.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>STRESS ECG TEST</b>			
<ul style="list-style-type: none"> <li>Knowledge of appropriate indications for exercise testing.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Knowledge of alternative physiological cardiovascular tests.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Knowledge of appropriate contraindications, risks, and risk assessment of testing (not limited to Bayes' theorem and sensitivity/specificity, including concepts of absolute and relative risk).</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Knowledge to promptly recognize and treat complications of exercise testing.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Knowledge of various exercise protocols and indications for each.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Knowledge of basic cardiovascular and exercise physiology, including hemodynamic response to exercise.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Knowledge of cardiac arrhythmias and the ability to recognize and treat serious arrhythmias.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Knowledge of cardiovascular drugs and how they can affect exercise performance, hemodynamics, and the ECG.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Knowledge of the effects of age and disease on hemodynamic and ECG responses to exercise.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Knowledge of principles and details of exercise testing, including proper lead placement and skin preparation.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Knowledge of end points of exercise testing and indications to terminate exercise testing.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Knowledge of specificity, sensitivity, and diagnostic accuracy of exercise testing in different patient populations.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Knowledge of how to apply Bayes' theorem to interpret test results.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Knowledge of electrocardiography and changes in the ECG that may result from exercise, hyperventilation, ischemia, hypertrophy, conduction disorders, electrolyte disturbances, and drugs.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	

Item	Achieved	Not Achieved	Preceptor Signature
<ul style="list-style-type: none"> <li>Knowledge of conditions and circumstances that can cause false-positive, indeterminate, or false-negative test results.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Knowledge of alternative or supplementary diagnostic procedures to exercise testing and when they should be used.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Knowledge of the concept of metabolic equivalent (MET) and estimation of exercise intensity in different modes of exercise.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Measure blood pressure and related vital signs.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Avoid stress ECG pitfalls.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Print SET on papers for documentation before sending to the medical doctor for reporting.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>HOLTER ECG</b>			
<ul style="list-style-type: none"> <li>Maintain the patient's privacy and dignity throughout procedure.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Complete preparation of patient's skin for electrode placement as required.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Position the patient correctly and comfortably and place electrodes in accordance with client's needs and current standards.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Attach leads correctly and double check lead placement.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Take a trial trace and check for interference, wandering baseline and amplitude.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Advise supervisor or an appropriate person if you think a client may be at risk.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Remove the Holter monitor from the patient.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Review and correct the computer analysis of Holter tape.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Identify abnormal ECG patterns which require immediate medical attention</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Print the full report and submit to cardiologist for review.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Print final report printed and send to requesting medical officer</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	

Item	Achieved	Not Achieved	Preceptor Signature
<ul style="list-style-type: none"> <li>Take a trial trace and check for interference, wandering baseline and amplitude.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Advise supervisor or an appropriate person if you think a client may be at risk.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Remove the Holter monitor from the patient.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Review and correct the computer analysis of Holter tape.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Identify abnormal ECG patterns which require immediate medical attention</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Print the full report and submit to cardiologist for review.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Print final report printed and send to requesting medical officer</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	

**COMMENTS:**

This table is to be filled by students:

Student Name \_\_\_\_\_ Sign. \_\_\_\_\_ Date \_\_\_\_\_

<b>Non-Invasive Rotation EVALUATION</b>	<b>Always (5)</b>	<b>Usually (4)</b>	<b>Sometimes (3)</b>	<b>Seldom (2)</b>	<b>Never (1)</b>
<ul style="list-style-type: none"> <li>▪ Did you clearly understand what was expected of you?</li> </ul>					
<b>COMMENTS:</b>					
<ul style="list-style-type: none"> <li>▪ Was supervision available to you in case you needed help in the middle of a procedure?</li> </ul>					
<b>COMMENTS:</b>					
<ul style="list-style-type: none"> <li>▪ Was the echo lab preceptor responsive to your questions?</li> </ul>					
<b>COMMENTS:</b>					
<ul style="list-style-type: none"> <li>▪ Did you have enough opportunity to demonstrate your knowledge and skill?</li> </ul>					
<b>COMMENTS:</b>					
<ul style="list-style-type: none"> <li>▪ Were the expectations appropriate for your level of training?</li> </ul>					
<b>COMMENTS:</b>					
<ul style="list-style-type: none"> <li>▪ Was the communication with your supervisor sufficient to meet your needs?</li> </ul>					
<b>COMMENTS:</b>					

## Cardiac Technology Department

### Internship Adult Cardiac Catheterization I Competencies

Student Name		ID#		Training Institute Name		Preceptor Name		Sign.	
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Item	Achieved	Not Achieved	Preceptor Signature
<b>GENERAL GUIDELINES, POLICIES AND PROCEDURES</b>			
<ul style="list-style-type: none"> <li>• Hospital Chart, Mission, Vision &amp; Values</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Review and adhere to policies and procedures</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Work attendance ethics</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Reprint labels</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>CATH LAB SAFTY</b>			
<ul style="list-style-type: none"> <li>• Read and understand Laboratory Safety Policies and Procedures</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Read, use and locate Safety Data Sheet (SDS)</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Safety handling of the tools                             <ul style="list-style-type: none"> <li>- Puncture needles</li> <li>- Wires</li> <li>- Catheters</li> </ul> </li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Safe handling of the imaging machine</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Personal Protective Equipment (PPE)</li> <li>• Radiation safety                             <ul style="list-style-type: none"> <li>- Lead equipment (lead apron and thyroid collar)</li> </ul> </li> <li>• Geiger counter (personal radiation detector)</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Emergency Codes</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>LOCATE AND USE</b>			

Item	Achieved	Not Achieved	Preceptor Signature
• Fire Extinguisher	<input type="checkbox"/>	<input type="checkbox"/>	
• Eye Wash	<input type="checkbox"/>	<input type="checkbox"/>	
• Safety Shower	<input type="checkbox"/>	<input type="checkbox"/>	
• Biohazard Spill kit	<input type="checkbox"/>	<input type="checkbox"/>	
• Chemical Spill kit	<input type="checkbox"/>	<input type="checkbox"/>	
• First Aid kit	<input type="checkbox"/>	<input type="checkbox"/>	
• Incident Report protocol	<input type="checkbox"/>	<input type="checkbox"/>	
<b>PATIENT PREPARATION</b>			
• Consent	<input type="checkbox"/>	<input type="checkbox"/>	
• Laboratory tests	<input type="checkbox"/>	<input type="checkbox"/>	
• Explanation of the procedure	<input type="checkbox"/>	<input type="checkbox"/>	
• Enter patient demographic details (and, ideally, details of body size) onto the machine.	<input type="checkbox"/>	<input type="checkbox"/>	
• Alens test for radial access	<input type="checkbox"/>	<input type="checkbox"/>	
• Patient exposure and wearing hospital gown	<input type="checkbox"/>	<input type="checkbox"/>	
• Scrubbing of the femoral and radial area and covering the patient with disposable sterile towels and sheets	<input type="checkbox"/>	<input type="checkbox"/>	
• Supine position	<input type="checkbox"/>	<input type="checkbox"/>	
• Attach ECG electrodes	<input type="checkbox"/>	<input type="checkbox"/>	
• Check the defibrillator	<input type="checkbox"/>	<input type="checkbox"/>	
• <b>Emergency Life Support</b>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>CARDIAC CATH LAB EQUIPMENT</b>			
<ul style="list-style-type: none"> <li>• Physiologic equipment</li> <li>- ECG/pressure recorder/analyzer (with or without computer interface)</li> <li>- Pressure transducers</li> <li>- Electrocardiography</li> <li>- Cardiac output thermodilution computer</li> <li>• e. Blood gas and oxygen content and saturation analyzer</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
• Angiographic equipment	<input type="checkbox"/>	<input type="checkbox"/>	
• Temporary pacemaker	<input type="checkbox"/>	<input type="checkbox"/>	

Item	Achieved	Not Achieved	Preceptor Signature
• IABP consoles	<input type="checkbox"/>	<input type="checkbox"/>	
• Emergency cart equipment	<input type="checkbox"/>	<input type="checkbox"/>	
<b>HANDLING OF MATERIALS</b>			
• Handling of the tools <ul style="list-style-type: none"> <li>- Puncture needle</li> <li>- Wires</li> <li>- Catheters</li> <li>- PCI tools</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
• Flushing of the tools	<input type="checkbox"/>	<input type="checkbox"/>	
• Sterile preparations	<input type="checkbox"/>	<input type="checkbox"/>	
• Infection control	<input type="checkbox"/>	<input type="checkbox"/>	
<b>BASIC CATH VIEWS</b>			
• Right and left anterior oblique	<input type="checkbox"/>	<input type="checkbox"/>	
• Anteroposterior	<input type="checkbox"/>	<input type="checkbox"/>	
• Caudal and cranial angulation	<input type="checkbox"/>	<input type="checkbox"/>	
• Lateral	<input type="checkbox"/>	<input type="checkbox"/>	
<b>ADDITIONAL VIEWS</b>			
• Extreme lateral	<input type="checkbox"/>	<input type="checkbox"/>	
• Right lateral	<input type="checkbox"/>	<input type="checkbox"/>	
<b>TECHNIQUES FOR EACH VIEW</b>			
• Machine movement for each angiographic view e.g. (RAO 30 CAUDAL 30)	<input type="checkbox"/>	<input type="checkbox"/>	
<b>ASSESSMENT OF CORONARY LESIONS</b>			
• Angiographically	<input type="checkbox"/>	<input type="checkbox"/>	
• Physiologically (FFR)	<input type="checkbox"/>	<input type="checkbox"/>	
• Intravascular imaging (IVUS, OCT)	<input type="checkbox"/>	<input type="checkbox"/>	
• <b>Assessment of LV function</b>	<input type="checkbox"/>	<input type="checkbox"/>	
• <b>Assessment of wall movement</b>	<input type="checkbox"/>	<input type="checkbox"/>	
• <b>Assessment of mitral regurgitation</b>	<input type="checkbox"/>	<input type="checkbox"/>	
• <b>Aortography</b>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>POST-PROCEDURE CARE</b>			
• Access site management (manual/mechanical access site compression)	<input type="checkbox"/>	<input type="checkbox"/>	

This table is to be filled by students:

Student Name \_\_\_\_\_ Sign. \_\_\_\_\_ Date \_\_\_\_\_

<b>Adult Cath I Rotation EVALUATION</b>	<b>Always (5)</b>	<b>Usually (4)</b>	<b>Sometimes (3)</b>	<b>Seldom (2)</b>	<b>Never (1)</b>
<ul style="list-style-type: none"> <li>▪ Did you clearly understand what was expected of you?</li> </ul>					
<b>COMMENTS:</b>					
<ul style="list-style-type: none"> <li>▪ Was supervision available to you in case you needed help in the middle of a procedure?</li> </ul>					
<b>COMMENTS:</b>					
<ul style="list-style-type: none"> <li>▪ Was the Cath lab preceptor responsive to your questions?</li> </ul>					
<b>COMMENTS:</b>					
<ul style="list-style-type: none"> <li>▪ Did you have enough opportunity to demonstrate your knowledge and skill?</li> </ul>					
<b>COMMENTS:</b>					
<ul style="list-style-type: none"> <li>▪ Were the expectations appropriate for your level of training?</li> </ul>					
<b>COMMENTS:</b>					
<ul style="list-style-type: none"> <li>▪ Was the communication with your supervisor sufficient to meet your needs?</li> </ul>					
<b>COMMENTS:</b>					

## Cardiac Technology Department

### Internship Adult Cardiac Catheterization II Competencies

<b>Student Name</b>		<b>ID#</b>		<b>Training Institute Name</b>		<b>Preceptor Name</b>		<b>Sign.</b>	
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Item	Achieved	Not Achieved	Preceptor Signature
<b>GENERAL GUIDELINES, POLICIES AND PROCEDURES</b>			
• Hospital Chart, Mission, Vision & Values	<input type="checkbox"/>	<input type="checkbox"/>	
• Review and adhere to policies and procedures	<input type="checkbox"/>	<input type="checkbox"/>	
• Work attendance ethics	<input type="checkbox"/>	<input type="checkbox"/>	
• Reprint labels	<input type="checkbox"/>	<input type="checkbox"/>	
<b>CATH LAB SAFETY</b>			
• Read and understand Laboratory Safety Policies and Procedures	<input type="checkbox"/>	<input type="checkbox"/>	
• Read, use and locate Safety Data Sheet (SDS)	<input type="checkbox"/>	<input type="checkbox"/>	
• Safety handling of the tools <ul style="list-style-type: none"> <li>- Puncture needles</li> <li>- Wires</li> <li>- Catheters</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
• Safe handling of the imaging machine	<input type="checkbox"/>	<input type="checkbox"/>	
• Personal Protective Equipment (PPE)	<input type="checkbox"/>	<input type="checkbox"/>	
• Radiation safety <ul style="list-style-type: none"> <li>- Lead equipment (lead apron and thyroid collar)</li> </ul>			
• Geiger counter (personal radiation detector)	<input type="checkbox"/>	<input type="checkbox"/>	
• Emergency Codes	<input type="checkbox"/>	<input type="checkbox"/>	
<b>LOCATE AND USE</b>			
• Fire Extinguisher	<input type="checkbox"/>	<input type="checkbox"/>	
• Eye Wash	<input type="checkbox"/>	<input type="checkbox"/>	
• Safety Shower	<input type="checkbox"/>	<input type="checkbox"/>	
• Biohazard Spill kit	<input type="checkbox"/>	<input type="checkbox"/>	
• Chemical Spill kit	<input type="checkbox"/>	<input type="checkbox"/>	

Item	Achieved	Not Achieved	Preceptor Signature
• First Aid kit	<input type="checkbox"/>	<input type="checkbox"/>	
• Incident Report protocol	<input type="checkbox"/>	<input type="checkbox"/>	
<b>PATIENT PREPARATION</b>			
• Consent	<input type="checkbox"/>	<input type="checkbox"/>	
• Laboratory tests	<input type="checkbox"/>	<input type="checkbox"/>	
• Explanation of the procedure	<input type="checkbox"/>	<input type="checkbox"/>	
• Enter patient demographic details (and, ideally, details of body size) onto the machine.	<input type="checkbox"/>	<input type="checkbox"/>	
• Alens test for radial access	<input type="checkbox"/>	<input type="checkbox"/>	
• Patient exposure and wearing hospital gown	<input type="checkbox"/>	<input type="checkbox"/>	
• Scrubbing of the femoral and radial area and covering the patient with disposable sterile towels and sheets	<input type="checkbox"/>	<input type="checkbox"/>	
• Supine position	<input type="checkbox"/>	<input type="checkbox"/>	
• Attach ECG electrodes	<input type="checkbox"/>	<input type="checkbox"/>	
• Check the defibrillator	<input type="checkbox"/>	<input type="checkbox"/>	
• <b>Emergency Life Support</b>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>CARDIAC CATH LAB EQUIPMENT</b>			
• Pressure transducer	<input type="checkbox"/>	<input type="checkbox"/>	
• Pressure zeroing and leveling	<input type="checkbox"/>	<input type="checkbox"/>	
• Movement of the C-Arm	<input type="checkbox"/>	<input type="checkbox"/>	
• Hand support during radial approach	<input type="checkbox"/>	<input type="checkbox"/>	
• Physiologic equipment - ECG/pressure recorder/analyzer (with or without computer interface) - Pressure transducers - Electrocardiography - Cardiac output thermodilution computer e. Blood gas and oxygen content and saturation analyzer	<input type="checkbox"/>	<input type="checkbox"/>	
• Angiographic equipment	<input type="checkbox"/>	<input type="checkbox"/>	
• Temporary pacemaker	<input type="checkbox"/>	<input type="checkbox"/>	

Item	Achieved	Not Achieved	Preceptor Signature
<ul style="list-style-type: none"> <li>IABP consoles</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Emergency cart equipment</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>HANDLING OF MATERIALS</b>			
<ul style="list-style-type: none"> <li>handling of the tools                             <ul style="list-style-type: none"> <li>Puncture needles</li> <li>Wires</li> <li>Catheters</li> <li>PCI tools</li> </ul> </li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Flushing of the tools</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Sterile preparations</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Infection control</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>BASIC CATH VIEWS</b>			
<ul style="list-style-type: none"> <li>Right and left anterior oblique</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Anteroposterior</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Caudal and cranial angulation</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Lateral</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>ADDITIONAL VIEWS</b>			
<ul style="list-style-type: none"> <li>Extreme lateral</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Right lateral</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>TECHNIQUES FOR EACH VIEW</b>			
<ul style="list-style-type: none"> <li>Machine movement for each angiographic view e.g. (RAO 30 CAUDAL 30)</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>ASSESSMENT OF CORONARY LESIONS</b>			
<ul style="list-style-type: none"> <li>Angiographically</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Physiologically (FFR)</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Intravascular imaging (IVUS, OCT)</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li><b>Assessment of LV function</b></li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li><b>Assessment of wall movement</b></li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li><b>Assessment of mitral regurgitation</b></li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li><b>Aortography</b></li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	

Item	Achieved	Not Achieved	Preceptor Signature
<b>POST-PROCEDURE CARE</b>			
<ul style="list-style-type: none"> <li>Access site management (manual/mechanical access site compression)</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>ELECTROPHYSIOLOGY</b>			
<ul style="list-style-type: none"> <li>Identify the indications of electrophysiologic study</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Placement of recording catheters in standard locations in the heart</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Describe the equipment, personnel, preparation, and technique</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>PATIENT PREPARATION FOR EPS STUDY</b>			
<ul style="list-style-type: none"> <li>patient must be fasting for at least six hours before the procedure</li> <li>Antiarrhythmic therapy must be withheld</li> <li>Intravenous access should be secured before the arrival in the Electrophysiology laboratory</li> <li>Fluids should be administered during the procedure to avoid Dehydration</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>TECHNIQUE</b>			
<ul style="list-style-type: none"> <li>Assessment of both the morphology and the timing of EGMs at baseline and after programmed electrical stimulation</li> <li>The recording speed commonly used in EPS</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>UNDERSTANDING AND OF THE FOLLOWING TERMS</b>			
<ul style="list-style-type: none"> <li>Cycle Length (CL)</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Programmed Stimulation</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Incremental pacing (or burst pacing)</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Extra stimulus pacing</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Coupling Interval</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Effective Refractory Period (ERP)</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>MEASURING INTERVALS</b>			
<ul style="list-style-type: none"> <li>PA Interval</li> <li>AH Interval</li> <li>H Time</li> <li>HV Interval</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	

**COMMENTS:**

This table is to be filled by students:

Student Name \_\_\_\_\_ Sign. \_\_\_\_\_ Date \_\_\_\_\_

<b>Adult Cath II Rotation EVALUATION</b>	<b>Always (5)</b>	<b>Usually (4)</b>	<b>Sometimes (3)</b>	<b>Seldom (2)</b>	<b>Never (1)</b>
<ul style="list-style-type: none"> <li>▪ Did you clearly understand what was expected of you?</li> </ul>					
<b>COMMENTS:</b>					
<ul style="list-style-type: none"> <li>▪ Was supervision available to you in case you needed help in the middle of a procedure?</li> </ul>					
<b>COMMENTS:</b>					
<ul style="list-style-type: none"> <li>▪ Was the Cath lab preceptor responsive to your questions?</li> </ul>					
<b>COMMENTS:</b>					
<ul style="list-style-type: none"> <li>▪ Did you have enough opportunity to demonstrate your knowledge and skill?</li> </ul>					
<b>COMMENTS:</b>					
<ul style="list-style-type: none"> <li>▪ Were the expectations appropriate for your level of training?</li> </ul>					
<b>COMMENTS:</b>					
<ul style="list-style-type: none"> <li>▪ Was the communication with your supervisor sufficient to meet your needs?</li> </ul>					
<b>COMMENTS:</b>					

## Cardiac Technology Department

### Internship Pediatric Cardiac Catheterization Competencies

Student Name		ID#		Training Institute Name		Preceptor Name		Sign.	
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Item	Achieved	Not Achieved	Preceptor Signature
<b>GENERAL GUIDELINES, POLICIES AND PROCEDURES</b>			
• Hospital Chart, Mission, Vision & Values	<input type="checkbox"/>	<input type="checkbox"/>	
• Review and adhere to policies and procedures	<input type="checkbox"/>	<input type="checkbox"/>	
• Work attendance ethics	<input type="checkbox"/>	<input type="checkbox"/>	
• Reprint labels	<input type="checkbox"/>	<input type="checkbox"/>	
<b>CATH LAB SAFTY</b>			
• Read and understand Laboratory Safety Policies and Procedures	<input type="checkbox"/>	<input type="checkbox"/>	
• Read, use and locate Safety Data Sheet (SDS)	<input type="checkbox"/>	<input type="checkbox"/>	
• Safety handling of the tools <ul style="list-style-type: none"> <li>- Puncture needles</li> <li>- Wires</li> <li>- Catheters</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
• Safe handling of the imaging machine	<input type="checkbox"/>	<input type="checkbox"/>	
• Personal Protective Equipment (PPE)	<input type="checkbox"/>	<input type="checkbox"/>	
• Radiation safety <ul style="list-style-type: none"> <li>- Lead equipment (lead apron and thyroid collar)</li> </ul>			
• Geiger counter (personal radiation detector)	<input type="checkbox"/>	<input type="checkbox"/>	
• Emergency Codes	<input type="checkbox"/>	<input type="checkbox"/>	
<b>LOCATE AND USE</b>			
• Fire Extinguisher	<input type="checkbox"/>	<input type="checkbox"/>	
• Eye Wash	<input type="checkbox"/>	<input type="checkbox"/>	
• Safety Shower	<input type="checkbox"/>	<input type="checkbox"/>	
• Biohazard Spill kit	<input type="checkbox"/>	<input type="checkbox"/>	
• Chemical Spill kit	<input type="checkbox"/>	<input type="checkbox"/>	

Item	Achieved	Not Achieved	Preceptor Signature
<ul style="list-style-type: none"> <li>• First Aid kit</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Incident Report protocol</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>PATIENT PREPARATION</b>			
<ul style="list-style-type: none"> <li>• Consent</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Laboratory tests</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Explanation of the procedure</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Enter patient demographic details (and, ideally, details of body size) onto the machine.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Alens test for radial access</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Patient exposure and wearing hospital gown</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Scrubbing of the femoral and radial area and covering the patient with disposable sterile towels and sheets</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Supine position</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Attach ECG electrodes</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Check the defibrillator</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• <b>Emergency Life Support</b></li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>CARDIAC CATH LAB EQUIPMENT</b>			
<ul style="list-style-type: none"> <li>• Pressure transducer</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Pressure zeroing and leveling</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Movement of the C-Arm</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Hand support during radial approach</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Physiologic equipment                             <ul style="list-style-type: none"> <li>- ECG/pressure recorder/analyzer (with or without computer interface)</li> <li>- Pressure transducers</li> <li>- Electrocardiography</li> <li>- Cardiac output thermodilution computer</li> <li>e. Blood gas and oxygen content and saturation analyzer</li> </ul> </li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Angiographic equipment</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Temporary pacemaker</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	

Item	Achieved	Not achieved	Preceptor Signature
• Intraaortic balloon pumps consoles	<input type="checkbox"/>	<input type="checkbox"/>	
• Emergency cart equipment	<input type="checkbox"/>	<input type="checkbox"/>	
<b>HANDLING OF MATERIALS</b>			
<ul style="list-style-type: none"> <li>• Handling of the tools               <ul style="list-style-type: none"> <li>- Puncture needles</li> <li>- Wires</li> <li>- Catheters</li> <li>- PCI tools</li> </ul> </li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
• Flushing of the tools	<input type="checkbox"/>	<input type="checkbox"/>	
• Sterile preparations	<input type="checkbox"/>	<input type="checkbox"/>	
• Infection control	<input type="checkbox"/>	<input type="checkbox"/>	
<b>BASIC CATH VIEWS</b>			
• Right and left anterior oblique	<input type="checkbox"/>	<input type="checkbox"/>	
• Anteroposterior	<input type="checkbox"/>	<input type="checkbox"/>	
• Caudal and cranial angulation	<input type="checkbox"/>	<input type="checkbox"/>	
• Lateral	<input type="checkbox"/>	<input type="checkbox"/>	
<b>ADDITIONAL VIEWS</b>			
• Extreme lateral	<input type="checkbox"/>	<input type="checkbox"/>	
• Right lateral	<input type="checkbox"/>	<input type="checkbox"/>	
<b>TECHNIQUES FOR EACH VIEW</b>			
• Machine movement for each angiographic view e.g. (RAO 30 CAUDAL 30)	<input type="checkbox"/>	<input type="checkbox"/>	
<b>ASSESSMENT OF CORONARY LESIONS</b>			
• Angiographically	<input type="checkbox"/>	<input type="checkbox"/>	
• Physiologically (FFR)	<input type="checkbox"/>	<input type="checkbox"/>	
• Intravascular imaging (IVUS, OCT)	<input type="checkbox"/>	<input type="checkbox"/>	
• <b>Assessment of LV function</b>	<input type="checkbox"/>	<input type="checkbox"/>	
• <b>Assessment of wall movement</b>	<input type="checkbox"/>	<input type="checkbox"/>	
• <b>Assessment of mitral regurgitation</b>	<input type="checkbox"/>	<input type="checkbox"/>	
• <b>Aortography</b>	<input type="checkbox"/>	<input type="checkbox"/>	

Item	Achieved	Not Achieved	Preceptor Signature
<b>POST-PROCEDURE CARE</b>			
<ul style="list-style-type: none"> <li>Access site management (manual/mechanical access site compression)</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>PEDIATRIC CATH</b>			
<ul style="list-style-type: none"> <li>Identify the indications of pediatric cath. study</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Preoperative Clinical Assessment</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Preoperative preparation</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Premedication, sedation, and anesthesia</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Post-operative care</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Describe the equipment, personnel, preparation, and technique</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>UNDERSTANDING AND APPLICATION OF THE FOLLOWING TERMS</b>			
<ul style="list-style-type: none"> <li>Cardiac output/Index measurements</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Shunts</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Pressure measurements</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Pressure gradient and valve area</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Vascular resistance</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>ABG machine handling (blood gas testing)</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li><b>Reporting</b></li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	

**COMMENTS:**

This table is to be filled by students:

Student Name \_\_\_\_\_ Sign. \_\_\_\_\_ Date \_\_\_\_\_

<b>Pediatric Cath Rotation EVALUATION</b>	<b>Always (5)</b>	<b>Usually (4)</b>	<b>Sometimes (3)</b>	<b>Seldom (2)</b>	<b>Never (1)</b>
<ul style="list-style-type: none"> <li>▪ Did you clearly understand what was expected of you?</li> </ul>					
<b>COMMENTS:</b>					
<ul style="list-style-type: none"> <li>▪ Was supervision available to you in case you needed help in the middle of a procedure?</li> </ul>					
<b>COMMENTS:</b>					
<ul style="list-style-type: none"> <li>▪ Was the Cath lab preceptor responsive to your questions?</li> </ul>					
<b>COMMENTS:</b>					
<ul style="list-style-type: none"> <li>▪ Did you have enough opportunity to demonstrate your knowledge and skill?</li> </ul>					
<b>COMMENTS:</b>					
<ul style="list-style-type: none"> <li>▪ Were the expectations appropriate for your level of training?</li> </ul>					
<b>COMMENTS:</b>					
<ul style="list-style-type: none"> <li>▪ Was the communication with your supervisor sufficient to meet your needs?</li> </ul>					
<b>COMMENTS:</b>					

## Cardiac Technology Department

### Internship Adult Echocardiography I Competencies

<b>Student Name</b>		<b>ID#</b>		<b>Training institute</b>		<b>Preceptor Name</b>		<b>Sign.</b>	
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Item	Achieved	Not Achieved	Preceptor Signature
<b>GENERAL GUIDLINES, POLICIES AND PROCEDURES</b>			
<ul style="list-style-type: none"> <li>• Hospital Chart, Mission, Vision &amp; Values</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Review and adhere to policies and procedures</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Work attendance ethics</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Reprint labels</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>ECHOCARDIOGRAPHY LAB</b>			
<ul style="list-style-type: none"> <li>• Read and understand Laboratory Safety Policies and Procedures</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Read, use and locate Safety Data Sheet (SDS)</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Safe handling of the echo machines, equipment, and probe</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Personal Protective Equipment (PPE)</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Emergency Codes</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>PATIENT PREPARATION</b>			
<ul style="list-style-type: none"> <li>• Explanation of the procedure</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Patient exposure (expose area of interest till the waist)</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Patient positioning in left lateral decubitus and their left hand up and behind the head in apical and parasternal views</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Supine in subcostal and suprasternal views</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Attach ECG electrodes</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Enter patient demographic details</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	

Item	Achieved	Not Achieved	Preceptor Signature
<b>PREPARING ECHOCARDIOGRAPHY MACHINE AND PROBE</b>			
<ul style="list-style-type: none"> <li>Set up an ergonomic orientation of machine, patient, and operator. This will depend on your preferred operator position.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Check transthoracic image settings on machine, with harmonic imaging (if available) and your preferred image post-processing options selected.</li> <li>Set overall gain, compress and transverse or lateral gain controls to standard positions</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Make sure there is ECG tracing</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Make sure image storage is possible</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Take the appropriate transthoracic probe, apply gel to transducer and start imaging.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>PROBE HANDLING AND IMAGE QUALITY</b>			
<ul style="list-style-type: none"> <li>The probe should be held in one hand and pressed firmly against the chest wall.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>A layer of gel ensures good contact between probe and chest wall.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<p><b>The probe can be moved in multiple directions but the four key movements are:</b></p> <ul style="list-style-type: none"> <li>Clockwise and anticlockwise rotation</li> <li>Tilting anteriorly and posteriorly</li> <li>Tilting to the left and to the right</li> <li>Sliding across the chest</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	

Item	Achieved	Not Achieved	Preceptor Signature
<b>2D IMAGE ACQUISITION</b>			
<p><b>Standard sequence of views:</b></p> <p><b>Parasternal windows</b></p> <ul style="list-style-type: none"> <li>• Parasternal long axis view</li> <li>• (Optional — parasternal right ventricle inflow)</li> <li>• (Optional — parasternal right ventricle outflow)</li> <li>• Parasternal short axis view (apex)</li> <li>• Parasternal short axis view (papillary level)</li> <li>• Parasternal short axis view (aortic level)</li> <li>• (Optional — right parasternal window).</li> </ul> <p><b>Apical window</b></p> <ul style="list-style-type: none"> <li>• Apical four chamber</li> <li>• Apical five chamber</li> <li>• Apical two chamber</li> <li>• Apical three chamber.</li> </ul> <p><b>Subcostal window</b></p> <ul style="list-style-type: none"> <li>• Subcostal long and short axis</li> <li>• Inferior vena cava</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>ADDITIONAL WINDOWS</b>			
<ul style="list-style-type: none"> <li>• Suprasternal window</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Right parasternal window</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Supraclavicular window</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>TECHNIQUES FOR EACH VIEW</b>			
<ul style="list-style-type: none"> <li>• Color flow mapping</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• M-mode</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	

Item	Achieved	Not Achieved	Preceptor Signature
• CW Doppler	<input type="checkbox"/>	<input type="checkbox"/>	
• PW Doppler	<input type="checkbox"/>	<input type="checkbox"/>	
• Tissue Doppler imaging	<input type="checkbox"/>	<input type="checkbox"/>	
• Speckle tracking imaging	<input type="checkbox"/>	<input type="checkbox"/>	
• 3D imaging	<input type="checkbox"/>	<input type="checkbox"/>	
• Contrast imaging.	<input type="checkbox"/>	<input type="checkbox"/>	
<b>ASSESSMENT OF LV SYSTOLIC FUNCTION</b>			
• Linear (M-mode and 2D)	<input type="checkbox"/>	<input type="checkbox"/>	
• Volume (2D and 3D)	<input type="checkbox"/>	<input type="checkbox"/>	
• Modified Simpson method	<input type="checkbox"/>	<input type="checkbox"/>	
• Area length	<input type="checkbox"/>	<input type="checkbox"/>	
• LV Mass	<input type="checkbox"/>	<input type="checkbox"/>	
• TDI	<input type="checkbox"/>	<input type="checkbox"/>	
• MPI	<input type="checkbox"/>	<input type="checkbox"/>	
<b>DIASTOLIC FUNCTION</b>			
• Mitral inflow	<input type="checkbox"/>	<input type="checkbox"/>	
• TDI	<input type="checkbox"/>	<input type="checkbox"/>	
• PV flow	<input type="checkbox"/>	<input type="checkbox"/>	
• LA volume	<input type="checkbox"/>	<input type="checkbox"/>	
<b>ASSESSMENT OF RV FUNCTION</b>			
• RV internal dimension	<input type="checkbox"/>	<input type="checkbox"/>	
• TAPSI	<input type="checkbox"/>	<input type="checkbox"/>	
• FAC	<input type="checkbox"/>	<input type="checkbox"/>	
• TDI	<input type="checkbox"/>	<input type="checkbox"/>	
• 3D	<input type="checkbox"/>	<input type="checkbox"/>	

Item	Achieved	Not Achieved	Preceptor Signature
<b>ASSESSMENT OF VALVULAR STRUCTURE AND FUNCTION</b>			
<ul style="list-style-type: none"> <li>• Velocity gradient</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Color doppler</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Planimetry</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>ECHOCARDIOGRAPHY MACHINE AND PROBE CLEANING</b>			
<b>REPORTING</b>	<input type="checkbox"/>	<input type="checkbox"/>	

**COMMENTS:**

This table is to be filled by students:

Student Name \_\_\_\_\_ Sign. \_\_\_\_\_ Date \_\_\_\_\_

<b>Adult Echo I Rotation EVALUATION</b>	<b>Always (5)</b>	<b>Usually (4)</b>	<b>Sometimes (3)</b>	<b>Seldom (2)</b>	<b>Never (1)</b>
<ul style="list-style-type: none"> <li>▪ Did you clearly understand what was expected of you?</li> </ul>					
<b>COMMENTS:</b>					
<ul style="list-style-type: none"> <li>▪ Was supervision available to you in case you needed help in the middle of a procedure?</li> </ul>					
<b>COMMENTS:</b>					
<ul style="list-style-type: none"> <li>▪ Was the Cath lab preceptor responsive to your questions?</li> </ul>					
<b>COMMENTS:</b>					
<ul style="list-style-type: none"> <li>▪ Did you have enough opportunity to demonstrate your knowledge and skill?</li> </ul>					
<b>COMMENTS:</b>					
<ul style="list-style-type: none"> <li>▪ Were the expectations appropriate for your level of training?</li> </ul>					
<b>COMMENTS:</b>					
<ul style="list-style-type: none"> <li>▪ Was the communication with your supervisor sufficient to meet your needs?</li> </ul>					
<b>COMMENTS:</b>					

## Cardiac Technology Department

### Internship Adult Echocardiography II Competencies

Student Name		ID#		Training institute		Preceptor Name		Sign.	
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Item	Achieved	Not Achieved	Preceptor Signature
<b>GENERAL GUIDELINES, POLICIES AND PROCEDURES</b>			
• Hospital chart, Mission, Vision & Values	<input type="checkbox"/>	<input type="checkbox"/>	
• Review and adhere to policies and procedures	<input type="checkbox"/>	<input type="checkbox"/>	
• Work attendance ethics	<input type="checkbox"/>	<input type="checkbox"/>	
• Reprint labels	<input type="checkbox"/>	<input type="checkbox"/>	
<b>ECHOCARDIOGRAPHY LAB</b>			
• Read and understand Laboratory Safety Policies and Procedures	<input type="checkbox"/>	<input type="checkbox"/>	
• Read, use and locate Safety Data Sheet (SDS)	<input type="checkbox"/>	<input type="checkbox"/>	
• Safe handling of the echo machines, equipment, and probe	<input type="checkbox"/>	<input type="checkbox"/>	
• Personal Protective Equipment (PPE)	<input type="checkbox"/>	<input type="checkbox"/>	
• Emergency Codes	<input type="checkbox"/>	<input type="checkbox"/>	
<b>PATIENT PREPARATION</b>			
• Consent in TEE	<input type="checkbox"/>	<input type="checkbox"/>	
• Explanation of the procedure	<input type="checkbox"/>	<input type="checkbox"/>	
• Patient exposure (expose area of interest till the waist)	<input type="checkbox"/>	<input type="checkbox"/>	
• Patient positioning in left lateral decubitus and their left hand up and behind the head in apical and parasternal views	<input type="checkbox"/>	<input type="checkbox"/>	
• Supine in subcostal and suprasternal views	<input type="checkbox"/>	<input type="checkbox"/>	
• In TEE, the patient lies in bed in left decubitus with a mouth guard is positioned between the jaws	<input type="checkbox"/>	<input type="checkbox"/>	
• Attach ECG electrodes	<input type="checkbox"/>	<input type="checkbox"/>	

<ul style="list-style-type: none"> <li>Enter patient demographic details</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
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Item	Achieved	Not achieved	Preceptor Signature
<b>TECHNIQUES FOR EACH VIEW</b>			
<ul style="list-style-type: none"> <li>Color flow mapping</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>M-mode</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>CW Doppler</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>PW Doppler</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Tissue Doppler imaging</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Speckle tracking imaging</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>3D imaging</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Contrast imaging.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>ASSESSMENT OF LV SYSTOLIC FUNCTION</b>			
<ul style="list-style-type: none"> <li>Linear (M-mode and 2D)</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Volume (2D and 3D)</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Modified Simpson method</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Area length</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>LV Mass</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>TDI</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>MPI</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>DIASTOLIC FUNCTION</b>			
<ul style="list-style-type: none"> <li>Mitral inflow</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>TDI</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>PV flow</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>LA volume</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>ASSESSMENT OF RV FUNCTION</b>			
<ul style="list-style-type: none"> <li>RV internal dimension</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>TAPSI</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>FAC</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	

• TDI	<input type="checkbox"/>	<input type="checkbox"/>	
• 3D	<input type="checkbox"/>	<input type="checkbox"/>	

Item	Achieved	Not achieved	Preceptor Signature
<b>ASSESSMENT OF VALVULAR STRUCTURE AND FUNCTION</b>			
• Velocity gradient	<input type="checkbox"/>	<input type="checkbox"/>	
• Color doppler	<input type="checkbox"/>	<input type="checkbox"/>	
• Planimetry	<input type="checkbox"/>	<input type="checkbox"/>	
<b>SETTING UP THE ENVIROMENT FOR TEE STUDY</b>			
• The student should talk to the patient and check identity and consent.	<input type="checkbox"/>	<input type="checkbox"/>	
• The student stands behind the patient or at the head of the bed to reassure the patient and support the head and mouth guard	<input type="checkbox"/>	<input type="checkbox"/>	
• During the procedure, the student should monitor hemodynamics and saturations and inform the operator if they change.	<input type="checkbox"/>	<input type="checkbox"/>	
• They monitor for secretions and give suction as required.	<input type="checkbox"/>	<input type="checkbox"/>	
• After the procedure they stay with the patient to ensure adequate recovery from sedation.	<input type="checkbox"/>	<input type="checkbox"/>	
<b>PREPARING TEE: A 10 POINT PLAN</b>			
• Put sheath on the probe.	<input type="checkbox"/>	<input type="checkbox"/>	
• Review referral form/notes for indication, contraindications.	<input type="checkbox"/>	<input type="checkbox"/>	
• Ask patient when last meal was (should be > 6 hours before), • previous problems with swallowing, known esophageal disease, allergies.	<input type="checkbox"/>	<input type="checkbox"/>	
• Insert patient name and hospital number on scanner and ask • patient to confirm.	<input type="checkbox"/>	<input type="checkbox"/>	
• Insert IV cannula	<input type="checkbox"/>	<input type="checkbox"/>	
• Attach probe to the scanner, test steering and whether probe is accepted by the scanner.	<input type="checkbox"/>	<input type="checkbox"/>	
• Start blood pressure monitoring and pulse oximetry, nasal specs for oxygen supply (2L/min).	<input type="checkbox"/>	<input type="checkbox"/>	

<ul style="list-style-type: none"><li>• Apply local anesthesia to patient's throat, then rotate patient into a left lateral decubitus position.</li></ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"><li>• Put in mouth guard.</li></ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"><li>• Give sedation.</li></ul>	<input type="checkbox"/>	<input type="checkbox"/>	

Item	Achieved	Not achieved	Preceptor Signature
<b>PROBE MOVEMENT IN TEE</b>			
<ul style="list-style-type: none"> <li>• Withdrawal and advance</li> <li>• Rotation (or turning)</li> <li>• Sector angle</li> <li>• Angulation (or retro-/ante-flexion)</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>TEE views</b>			
<ul style="list-style-type: none"> <li>• 4-chamber view.</li> <li>• 5-chamber view.</li> <li>• Short axis aortic view (<math>\pm</math> right ventricle inflow/outflow).</li> <li>• Long axis aortic view.</li> <li>• Interatrial septal view.</li> <li>• Left atrial appendage view.</li> <li>• then further views</li> <li>• Left pulmonary venous view.</li> <li>• Right pulmonary venous view.</li> <li>• Pulmonary artery view.</li> <li>• Trans-gastric views.</li> <li>• Descending aorta view.</li> <li>• Aortic arch view.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>DOBUTAMINE STRESS ECHOCARDIOGRAM (DES)</b>			
<p><b>Preparation for DES:</b></p> <ul style="list-style-type: none"> <li>• Consent</li> <li>• Check allergy to any medicines.</li> <li>• Fasting before the test.</li> <li>• Tobacco use and caffeinated beverages, such as coffee, tea, and soda, may be restricted several hours before testing.</li> <li>• Hold certain medicines before the test, such as beta-blockers.</li> <li>• IV canula for Dobutamine administration.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>STRESS ECHOCARDIOGRAPHY VIEWS</b>			
<p><b>The key 4 views are:</b></p> <ul style="list-style-type: none"> <li>• Apical 4-chamber</li> <li>• Apical 2-chamber</li> <li>• Parasternal short axis</li> <li>• Parasternal long axis (or apical long axis)</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	

Item	Achieved	Not achieved	Preceptor Signature
<p><b>Machine settings:</b></p> <ul style="list-style-type: none"> <li>• select harmonic imaging and adjust focus zone.</li> <li>• Ideally, frame rate should be &gt; 25 frames/s (if heart rate &gt; 140 then frame rates &gt; 30 frames/s may be better).</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>TERMINATION CRITERIA</b>			
<p><b>Treadmill exercise echocardiography should be terminated at traditional endpoints:</b></p> <ul style="list-style-type: none"> <li>• Attainment of target heart rates.</li> <li>• Cardiovascular symptoms.</li> <li>• Significant ECG changes or arrhythmias.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>ECHOCARDIOGRAPHY MACHINE AND PROBE CLEANING</b>			
<b>REPORTING</b>	<input type="checkbox"/>	<input type="checkbox"/>	

COMMENTS:

This table is to be filled by students:

Student Name \_\_\_\_\_ Sign. \_\_\_\_\_ Date \_\_\_\_\_

<b>Adult Echo II Rotation EVALUATION</b>	<b>Always (5)</b>	<b>Usually (4)</b>	<b>Sometimes (3)</b>	<b>Seldom (2)</b>	<b>Never (1)</b>
<ul style="list-style-type: none"> <li>▪ Did you clearly understand what was expected of you?</li> </ul>					
<b>COMMENTS:</b>					
<ul style="list-style-type: none"> <li>▪ Was supervision available to you in case you needed help in the middle of a procedure?</li> </ul>					
<b>COMMENTS:</b>					
<ul style="list-style-type: none"> <li>▪ Was the Cath lab preceptor responsive to your questions?</li> </ul>					
<b>COMMENTS:</b>					
<ul style="list-style-type: none"> <li>▪ Did you have enough opportunity to demonstrate your knowledge and skill?</li> </ul>					
<b>COMMENTS:</b>					
<ul style="list-style-type: none"> <li>▪ Were the expectations appropriate for your level of training?</li> </ul>					
<b>COMMENTS:</b>					
<ul style="list-style-type: none"> <li>▪ Was the communication with your supervisor sufficient to meet your needs?</li> </ul>					
<b>COMMENTS:</b>					

## Cardiac Technology Department

### Internship Pediatric Echocardiography competencies

<b>Student Name</b>		<b>ID#</b>		<b>Training institute</b>		<b>Preceptor Name</b>		<b>Sign.</b>	
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Item	Achieved	Not Achieved	Preceptor Signature
<b>GENERAL GUIDLINES, POLICIES AND PROCEDURES</b>			
• hospital chart, Mission, Vision & Values	<input type="checkbox"/>	<input type="checkbox"/>	
• Review and adhere to policies and procedures	<input type="checkbox"/>	<input type="checkbox"/>	
• Work attendance ethics	<input type="checkbox"/>	<input type="checkbox"/>	
• Reprint labels	<input type="checkbox"/>	<input type="checkbox"/>	
<b>ECHOCARDIOGRAPHY LAB</b>			
• Read and understand Laboratory Safety Policies and Procedures	<input type="checkbox"/>	<input type="checkbox"/>	
• Read, use and locate Safety Data Sheet (SDS)	<input type="checkbox"/>	<input type="checkbox"/>	
• Safe handling of the echo machines, equipment, and probe	<input type="checkbox"/>	<input type="checkbox"/>	
• Personal Protective Equipment (PPE)	<input type="checkbox"/>	<input type="checkbox"/>	
• Emergency Codes	<input type="checkbox"/>	<input type="checkbox"/>	
<b>PATIENT PREPARATION</b>			
• Consent by parents.	<input type="checkbox"/>	<input type="checkbox"/>	
• Sedation consent if needed.	<input type="checkbox"/>	<input type="checkbox"/>	
• Explanation of the procedure	<input type="checkbox"/>	<input type="checkbox"/>	
• Patient exposure (expose area of interest till the waist)	<input type="checkbox"/>	<input type="checkbox"/>	
• Patient positioning in left lateral decubitus and their left hand up and behind the head in apical and parasternal views	<input type="checkbox"/>	<input type="checkbox"/>	
• Supine in subcostal and suprasternal views	<input type="checkbox"/>	<input type="checkbox"/>	
• Attach ECG electrodes	<input type="checkbox"/>	<input type="checkbox"/>	
• Enter patient demographic details	<input type="checkbox"/>	<input type="checkbox"/>	

Item	Achieved	Not achieved	Preceptor Signature
<b>PEDIATRIC ECHOCARDIOGRAPHY VIEWS AND ASSESSMENT</b>			
<ul style="list-style-type: none"> <li>• Abdominal transverse (Subcostal window with probe marker at ~3 o'clock)</li> <li>• Abdominal longitudinal (Subcostal window with the probe marker towards head ~12 o'clock)</li> <li>• Parasternal long axis including the inflow and outflow views</li> <li>• Parasternal short axis</li> <li>• Apical 2, 3, 4, 5 chamber views</li> <li>• Suprasternal view</li> <li>• Right parasternal long axis</li> </ul>	□	□	
<ul style="list-style-type: none"> <li>• Apply basic principles of transthoracic echocardiography assessment of ventricular function, valvular function, and presence of a pericardial effusion is usually possible in all patients</li> </ul>	□	□	
<ul style="list-style-type: none"> <li>• Sequential segmental analysis</li> <li>• Abdominal situs Solitus</li> <li>• Cardiac position</li> <li>• Apex orientation</li> <li>• Atrial anatomy and systemic venous connections</li> <li>• Atrioventricular connections</li> <li>• Morphology of Ventricles</li> <li>• Morphology of great arteries</li> </ul>	□	□	
<ul style="list-style-type: none"> <li>• Establish arrangement of atrial chambers (situs)</li> <li>• Determine ventricular morphology and arrangement: atrioventricular</li> <li>• (AV) connections</li> <li>• Determine morphology of great arteries</li> <li>• Ventriculoarterial (VA) connections</li> <li>• Assess for any associated intracardiac lesions</li> </ul>	□	□	
<b>TECHNIQUES FOR EACH VIEW</b>			
<ul style="list-style-type: none"> <li>• Color flow mapping</li> </ul>	□	□	
<ul style="list-style-type: none"> <li>• M-mode</li> </ul>	□	□	
<ul style="list-style-type: none"> <li>• CW Doppler</li> </ul>	□	□	
<ul style="list-style-type: none"> <li>• PW Doppler</li> </ul>	□	□	
<ul style="list-style-type: none"> <li>• Tissue Doppler imaging</li> </ul>	□	□	
<ul style="list-style-type: none"> <li>• Speckle tracking imaging</li> </ul>	□	□	
<ul style="list-style-type: none"> <li>• 3D imaging</li> </ul>	□	□	
<ul style="list-style-type: none"> <li>• Contrast imaging.</li> </ul>	□	□	

Item	Achieved	Not achieved	Preceptor Signature
<b>ASSESSMENT OF LV SYSTOLIC FUNCTION</b>			
• Linear (M-mode and 2D)	<input type="checkbox"/>	<input type="checkbox"/>	
• Volume (2D and 3D)	<input type="checkbox"/>	<input type="checkbox"/>	
• Modified Simpson method	<input type="checkbox"/>	<input type="checkbox"/>	
• Area length	<input type="checkbox"/>	<input type="checkbox"/>	
• LV Mass	<input type="checkbox"/>	<input type="checkbox"/>	
• TDI	<input type="checkbox"/>	<input type="checkbox"/>	
• MPI	<input type="checkbox"/>	<input type="checkbox"/>	
<b>DIASTOLIC FUNCTION</b>			
• Mitral inflow	<input type="checkbox"/>	<input type="checkbox"/>	
• TDI	<input type="checkbox"/>	<input type="checkbox"/>	
• PV flow	<input type="checkbox"/>	<input type="checkbox"/>	
• LA volume	<input type="checkbox"/>	<input type="checkbox"/>	
<b>ECHOCARDIOGRAPHY MACHINE AND PROBE CLEANING</b>			
Preliminary Report	<input type="checkbox"/>	<input type="checkbox"/>	

**COMMENTS:**

This table is to be filled by students:

Student Name \_\_\_\_\_ Sign. \_\_\_\_\_ Date \_\_\_\_\_

<b>Pediatric Echo Rotation EVALUATION</b>	<b>Always (5)</b>	<b>Usually (4)</b>	<b>Sometimes (3)</b>	<b>Seldom (2)</b>	<b>Never (1)</b>
<ul style="list-style-type: none"> <li>▪ Did you clearly understand what was expected of you?</li> </ul>					
<b>COMMENTS:</b>					
<ul style="list-style-type: none"> <li>▪ Was supervision available to you in case you needed help in the middle of a procedure?</li> </ul>					
<b>COMMENTS:</b>					
<ul style="list-style-type: none"> <li>▪ Was the echo lab preceptor responsive to your questions?</li> </ul>					
<b>COMMENTS:</b>					
<ul style="list-style-type: none"> <li>▪ Did you have enough opportunity to demonstrate your knowledge and skill?</li> </ul>					
<b>COMMENTS:</b>					
<ul style="list-style-type: none"> <li>▪ Were the expectations appropriate for your level of training?</li> </ul>					
<b>COMMENTS:</b>					
<ul style="list-style-type: none"> <li>▪ Was the communication sufficient to meet your needs?</li> </ul>					
<b>COMMENTS:</b>					

## Cardiac Technology Department Internship rotation / Adult Cardiac Perfusion I Competencies

Date: \_\_\_\_\_

<b>Student Name</b>		<b>ID#</b>		<b>Training Institute Name</b>		<b>Preceptor Name</b>		<b>Sign.</b>	
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Item	Achieved	Not Achieved	Preceptor Signature
<b>GENERAL GUIDELINES, POLICIES AND PROCEDURES</b>			
• Hospital Chart, Mission, Vision & Values	<input type="checkbox"/>	<input type="checkbox"/>	
• Review and adhere to policies and procedures	<input type="checkbox"/>	<input type="checkbox"/>	
• Work attendance ethics	<input type="checkbox"/>	<input type="checkbox"/>	
• Reprint labels	<input type="checkbox"/>	<input type="checkbox"/>	
<b>OR SAFETY PROTOCOLS</b>			
• Read and understand the OR Safety Policies and Procedures	<input type="checkbox"/>	<input type="checkbox"/>	
• Read, use and locate Safety Data Sheet (SDS)	<input type="checkbox"/>	<input type="checkbox"/>	
• Safety handling of the tools <ul style="list-style-type: none"> <li>- Puncture needles</li> <li>- Wires</li> <li>- Arterial cannula</li> <li>- Venous cannula</li> <li>- Clamping techniques</li> <li>- Vents and suckers</li> <li>- Costume pack (Heart Lung pack)</li> <li>- Identify manages and adjusts oxygen/air blending</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
• Safe handling of the CPB machine	<input type="checkbox"/>	<input type="checkbox"/>	
• Personal Protective Equipment (PPE)	<input type="checkbox"/>	<input type="checkbox"/>	
• Emergency Codes	<input type="checkbox"/>	<input type="checkbox"/>	
• Emergency Life Support (BLS certificate)	<input type="checkbox"/>	<input type="checkbox"/>	
<b>LOCATE AND USE</b>			
• Fire Extinguisher	<input type="checkbox"/>	<input type="checkbox"/>	
• Eye Wash	<input type="checkbox"/>	<input type="checkbox"/>	
• Safety Shower	<input type="checkbox"/>	<input type="checkbox"/>	
• Biohazard Spill kit	<input type="checkbox"/>	<input type="checkbox"/>	
• Body fluids Spill kit	<input type="checkbox"/>	<input type="checkbox"/>	
• First Aid kit	<input type="checkbox"/>	<input type="checkbox"/>	
• Incident Report protocol	<input type="checkbox"/>	<input type="checkbox"/>	

Item	Achieved	Not Achieved	Preceptor Signature
<b>PATIENT PREPARATION</b>			
<ul style="list-style-type: none"> <li>Verify patient identity, procedure, consent, and surgical plan</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Review latest labs: CBC, coagulation profile, electrolytes, ABG</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Explanation of the procedure</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Enter patient demographic details (and, ideally, details of body size) onto the machine</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Ensure adequate IV access and arterial/central lines are functioning</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Confirm availability of blood products and crossmatch results</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Verify the adequacy of heparin by ACT</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>BASIC CPB MANAGEMENT</b>			
<ul style="list-style-type: none"> <li>Accurately performs pre-bypass checklist and safety verification procedures.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Completes independent setup and priming of the CPB circuit (adult, standard).</li> <li>Continuously adjust Oxygen /Air blinding</li> <li>Gradual initiation while monitoring:                             <ul style="list-style-type: none"> <li>- Arterial pressure</li> <li>- Venous return</li> <li>- Circuit flows</li> </ul> </li> <li>Confirm successful transition before stopping ventilation and adjusting anesthetics.</li> <li>Check Pressure Transducers</li> <li>Check Thermal Transducers</li> <li>Setting up all alarms</li> <li>ABG: Blood gas and oxygen content and saturation analyzer</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Maintains established perfusion parameters (flow, pressure, hemodilution) during routine bypass.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Safely initiates and terminates CPB per institutional protocol.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Administers routine cardioplegia (antegrade/retrograde) and manages preservation temperatures.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>DURING CPB: Monitoring &amp; Response</b>			
<ul style="list-style-type: none"> <li>Interprets and responds appropriately to changes in blood gas and ACT results.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Manages level alarms, pressure changes, and common air handling issues (e.g., venous air).</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Initiates and manages basic Intra-Aortic Balloon Pump (IABP) support.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Proficiently manages autotransfusion (Cell Saver) devices and protocols</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	

Item	Achieved	Not Achieved	Preceptor Signature
<b>DOCUMENTATION &amp; PROFESSIONALISM</b>			
<ul style="list-style-type: none"> <li>Complete accurate, legible, and timely documentation of all perfusion events and parameters.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Communicate effectively with the OR team (e.g., status updates, drug requests).</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Adheres strictly to infection control and anticoagulation protocols.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>COMPLEX/ADVANCED CPB TECHNIQUES</b>			
<ul style="list-style-type: none"> <li>Manage different stages of hypothermia during CPB</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Hemoconcentration and Hemodilution techniques</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>ASSESSMENT OF SPECIAL CARDIAC CONDITIONS</b>			
<ul style="list-style-type: none"> <li>Coronary lesions</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Valvular heart diseases</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Congenital heart anomalies</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>POST-PROCEDURE CARE</b>			
<ul style="list-style-type: none"> <li>Hemostasis &amp; Reversal of Anticoagulation</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Hemodynamic Stabilization</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Monitoring for Complications</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Ensure complete handover of all intra-operative documentation to the designated postoperative care team.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	

**COMMENTS:**

This table is to be filled by students:

Student Name \_\_\_\_\_ Sign. \_\_\_\_\_ Date \_\_\_\_\_

<b>Adult Perfusion I Rotation EVALUATION</b>	<b>Always (5)</b>	<b>Usually (4)</b>	<b>Sometimes (3)</b>	<b>Seldom (2)</b>	<b>Never (1)</b>
<ul style="list-style-type: none"> <li>▪ Did you clearly understand what was expected of you?</li> </ul>					
<b>COMMENTS:</b>					
<ul style="list-style-type: none"> <li>▪ Was supervision available to you in case you needed help in the middle of a procedure?</li> </ul>					
<b>COMMENTS:</b>					
<ul style="list-style-type: none"> <li>▪ Was the OR preceptor responsive to your questions?</li> </ul>					
<b>COMMENTS:</b>					
<ul style="list-style-type: none"> <li>▪ Did you have enough opportunity to demonstrate your knowledge and skill?</li> </ul>					
<b>COMMENTS:</b>					
<ul style="list-style-type: none"> <li>▪ Were the expectations appropriate for your level of training?</li> </ul>					
<b>COMMENTS:</b>					
<ul style="list-style-type: none"> <li>▪ Was the communication with your supervisor sufficient to meet your needs?</li> </ul>					
<b>COMMENTS:</b>					

## Cardiac Technology Department Internship year / Adult Cardiac Perfusion II Competencies

Date: \_\_\_\_\_

<b>Student Name</b>		<b>ID#</b>		<b>Training Institute Name</b>		<b>Preceptor Name</b>		<b>Sign.</b>	
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Item	Achieved	Not Achieved	Preceptor Signature
<b>GENERAL GUIDELINES, POLICIES AND PROCEDURES</b>			
• Hospital Chart, Mission, Vision & Values	<input type="checkbox"/>	<input type="checkbox"/>	
• Review and adhere to policies and procedures	<input type="checkbox"/>	<input type="checkbox"/>	
• Work attendance ethics	<input type="checkbox"/>	<input type="checkbox"/>	
• Reprint labels	<input type="checkbox"/>	<input type="checkbox"/>	
<b>OR SAFTY PROTOCOLS</b>			
• Read and understand the OR Safety Policies and Procedures	<input type="checkbox"/>	<input type="checkbox"/>	
• Read, use and locate Safety Data Sheet (SDS)	<input type="checkbox"/>	<input type="checkbox"/>	
• Safety handling of the tools <ul style="list-style-type: none"> <li>- Puncture needles</li> <li>- Wires</li> <li>- Arterial cannula</li> <li>- Venous cannula</li> <li>- Clamping techniques</li> <li>- Costume pack (Heart Lung pack)</li> <li>- Identify manages and adjusts oxygen/air blending</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
• Safe handling of the CPB machine	<input type="checkbox"/>	<input type="checkbox"/>	
• Personal Protective Equipment (PPE)	<input type="checkbox"/>	<input type="checkbox"/>	
• Emergency Codes	<input type="checkbox"/>	<input type="checkbox"/>	
• Emergency Life Support (BLS certificate)	<input type="checkbox"/>	<input type="checkbox"/>	
<b>LOCATE AND USE</b>			
• Fire Extinguisher	<input type="checkbox"/>	<input type="checkbox"/>	
• Eye Wash	<input type="checkbox"/>	<input type="checkbox"/>	
• Safety Shower	<input type="checkbox"/>	<input type="checkbox"/>	
• Biohazard Spill kit	<input type="checkbox"/>	<input type="checkbox"/>	
• Body fluids Spill kit	<input type="checkbox"/>	<input type="checkbox"/>	
• First Aid kit	<input type="checkbox"/>	<input type="checkbox"/>	
• Incident Report protocol	<input type="checkbox"/>	<input type="checkbox"/>	

Item	Achieved	Not Achieved	Preceptor Signature
<b>PATIENT PREPARATION</b>			
<ul style="list-style-type: none"> <li>• Verify patient identity, procedure, consent, and surgical plan</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Review latest labs: CBC, coagulation profile, electrolytes, ABG</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Explanation of the procedure</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Enter patient demographic details (and, ideally, details of body size) onto the machine</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Ensure adequate IV access and arterial/central lines are functioning</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Confirm availability of blood products and crossmatch results</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Verify the adequacy of heparin by ACT</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>BASIC CPB MANAGEMENT</b>			
<ul style="list-style-type: none"> <li>• Accurately performs pre-bypass checklist and safety verification procedures.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Completes independent setup and priming of the CPB circuit (adult, standard).</li> <li>• Continuously adjust Oxygen /Air blinding</li> <li>• Gradual initiation while monitoring:                             <ul style="list-style-type: none"> <li>- Arterial pressure</li> <li>- Venous return</li> <li>- Circuit flows</li> </ul> </li> <li>• Confirm successful transition before stopping ventilation and adjusting anesthetics.</li> <li>• Check Pressure Transducers</li> <li>• Check Thermal Transducers</li> <li>• Setting up all alarms</li> <li>• ABG: Blood gas and oxygen content and saturation analyzer</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Maintains established perfusion parameters (flow, pressure, hemodilution) during routine bypass.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Safely initiates and terminates CPB per institutional protocol.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Administers routine cardioplegia (antegrade/retrograde) and manages preservation temperatures.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>DURING CPB: Monitoring &amp; Response</b>			
<ul style="list-style-type: none"> <li>• Hemodynamic Monitoring                             <ul style="list-style-type: none"> <li>- Arterial pressure</li> <li>- Venous return</li> <li>- Pump flow rates</li> <li>- Central venous pressure (CVP)</li> </ul> </li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	

<ul style="list-style-type: none"> <li>• Oxygenation &amp; Ventilation                             <ul style="list-style-type: none"> <li>- Arterial blood gases (ABG)</li> <li>- Mixed venous oxygen saturation (SvO<sub>2</sub>)</li> <li>- Oxygenator performance</li> </ul> </li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Temperature Monitoring                             <ul style="list-style-type: none"> <li>- Core temperature (nasopharyngeal, bladder, or rectal)</li> <li>- Perfusate temperature</li> <li>- Cooling/warming gradient</li> </ul> </li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Hematologic Monitoring                             <ul style="list-style-type: none"> <li>- Hemoglobin/hematocrit</li> <li>- Coagulation (ACT during rewarming or if clotting suspected)</li> <li>- Platelet count (post-CPB)</li> </ul> </li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Electrolyte &amp; Metabolic Monitoring</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Neurological Monitoring</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Cannula &amp; Circuit Monitoring                             <ul style="list-style-type: none"> <li>- Air bubbles</li> <li>- Line pressures</li> <li>- Cannula positioning</li> <li>- Oxygenator resistance</li> </ul> </li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Proficiently manages autotransfusion (Cell Saver) devices and protocols</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	

Item	Achieved	Not Achieved	Preceptor Signature
<b>DOCUMENTATION &amp; PROFESSIONALISM</b>			
<ul style="list-style-type: none"> <li>• Complete accurate, legible, and timely documentation of all perfusion events and parameters.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Communicate effectively with the OR team (e.g., status updates, drug requests).</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Adheres strictly to infection control and anticoagulation protocols.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>COMPLEX/ADVANCED CPB TECHNIQUES</b>			
<ul style="list-style-type: none"> <li>• Manages CPB during deep hypothermic circulatory arrest (DHCA) procedures.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Manages complex CPB scenarios (e.g., massive hemorrhage, re-operation, high-risk endocarditis).</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>• Implements Advanced Myocardial Preservation strategies (e.g., warm blood induction, continuous/intermittent).</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>ADVANCED MECHANICAL SUPPORT</b>			

<ul style="list-style-type: none"> <li>Independently set up, initiates, and manages Venous-Arterial (VA) ECMO support.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Manages transport and patient care protocols for ECMO and complex VAD support (e.g., Impella, Tandem Heart).</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Develop specialized circuit configurations for atypical support scenarios (e.g., partial bypass).</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>LEADERSHIP &amp; CRISIS MANAGEMENT</b>			
<ul style="list-style-type: none"> <li>Demonstrates advanced knowledge of complex hematology, pharmacology, and gas dynamics related to long-term support.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Assumes leadership during a catastrophic circuit failure (e.g., massive air embolism, circuit rupture).</li> </ul>			

**COMMENTS:**

This table is to be filled by students:

Date \_\_\_\_\_

Sign. \_\_\_\_\_

<b>Adult Perfusion II Rotation EVALUATION</b>	<b>Always (5)</b>	<b>Usually (4)</b>	<b>Sometimes (3)</b>	<b>Seldom (2)</b>	<b>Never (1)</b>
<ul style="list-style-type: none"> <li>▪ Did you clearly understand what was expected of you?</li> </ul>					
<b>COMMENTS:</b>					
<ul style="list-style-type: none"> <li>▪ Was supervision available to you in case you needed help in the middle of a procedure?</li> </ul>					
<b>COMMENTS:</b>					
<ul style="list-style-type: none"> <li>▪ Was the OR preceptor responsive to your questions?</li> </ul>					
<b>COMMENTS:</b>					
<ul style="list-style-type: none"> <li>▪ Did you have enough opportunity to demonstrate your knowledge and skill?</li> </ul>					
<b>COMMENTS:</b>					
<ul style="list-style-type: none"> <li>▪ Were the expectations appropriate for your level of training?</li> </ul>					
<b>COMMENTS:</b>					
<ul style="list-style-type: none"> <li>▪ Was the communication with your supervisor sufficient to meet your needs?</li> </ul>					
<b>COMMENTS:</b>					

## Cardiac Technology Department Internship rotation / Pediatric Cardiac Perfusion Competencies

Date: \_\_\_\_\_

<b>Student Name</b>		<b>ID#</b>		<b>Training Institute Name</b>		<b>Preceptor Name</b>		<b>Sign.</b>	
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Item	Achieved	Not Achieved	Preceptor Signature
<b>GENERAL GUIDELINES, POLICIES AND PROCEDURES</b>			
• Hospital Chart, Mission, Vision & Values	<input type="checkbox"/>	<input type="checkbox"/>	
• Review and adhere to policies and procedures	<input type="checkbox"/>	<input type="checkbox"/>	
• Work attendance ethics	<input type="checkbox"/>	<input type="checkbox"/>	
• Reprint labels	<input type="checkbox"/>	<input type="checkbox"/>	
<b>OR SAFETY PROTOCOLS</b>			
• Read and understand the OR Safety Policies and Procedures	<input type="checkbox"/>	<input type="checkbox"/>	
• Read, use and locate Safety Data Sheet (SDS)	<input type="checkbox"/>	<input type="checkbox"/>	
• Safety handling of the tools <ul style="list-style-type: none"> <li>- Puncture needles</li> <li>- Wires</li> <li>- Arterial cannula</li> <li>- Venous cannula</li> <li>- Clamping techniques</li> <li>- Costume pack (Heart Lung pack)</li> <li>- Identify manages and adjusts oxygen/air blending</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
• Safe handling of the CPB machine	<input type="checkbox"/>	<input type="checkbox"/>	
• Personal Protective Equipment (PPE)	<input type="checkbox"/>	<input type="checkbox"/>	
• Emergency Codes	<input type="checkbox"/>	<input type="checkbox"/>	
• Emergency Life Support (BLS certificate)	<input type="checkbox"/>	<input type="checkbox"/>	
<b>LOCATE AND USE</b>			
• Fire Extinguisher	<input type="checkbox"/>	<input type="checkbox"/>	
• Eye Wash	<input type="checkbox"/>	<input type="checkbox"/>	
• Safety Shower	<input type="checkbox"/>	<input type="checkbox"/>	
• Biohazard Spill kit	<input type="checkbox"/>	<input type="checkbox"/>	
• Body fluids Spill kit	<input type="checkbox"/>	<input type="checkbox"/>	
• First Aid kit	<input type="checkbox"/>	<input type="checkbox"/>	
• Incident Report protocol	<input type="checkbox"/>	<input type="checkbox"/>	

Item	Achieved	Not Achieved	Preceptor Signature
<b>PATIENT PREPARATION</b>			
<ul style="list-style-type: none"> <li>Verify patient identity, procedure, consent, and surgical plan</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Review latest labs: CBC, coagulation profile, electrolytes, ABG</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Explanation of the procedure</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Enter patient demographic details (and, ideally, details of body size) onto the machine</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Ensure adequate IV access and arterial/central lines are functioning</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Confirm availability of blood products and crossmatch results</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Verify the adequacy of heparin by ACT</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>BASIC CPB MANAGEMENT</b>			
<ul style="list-style-type: none"> <li>Completes independent setup and priming of the CPB circuit (pediatric, standard).</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Circuit Selection: Accurately selects and assembles age/weight-appropriate circuits (miniaturization, reservoirs, oxygenators, tubing sizes) to minimize prime volume.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Low Prime/Prime Modification: Proficiently implements modified ultrafiltration (MUF) and uses specialized priming techniques (e.g., cell washer processing of prime, donor blood) to manage hemodilution.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Gas &amp; Blending: Manages and adjusts oxygen/air blending (sweep gas/FIO<sub>2</sub>) to maintain optimal blood gas targets in neonates, compensating for smaller gas exchange surfaces.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Surgical Site Setup: Manages limited OR space and sterile fields during complex pediatric procedures with multiple lines and access points.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>DURING CPB: PHYSIOLOGY &amp; MONITORING</b>			
<ul style="list-style-type: none"> <li>Demonstrate advanced understanding of pediatric congenital heart defects (e.g., Tetralogy of Fallot, Transposition of Great Arteries, HLHS) and their surgical repair implications.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Flow Management: Accurately calculates and maintains weight/BSA-based flow rates and mean arterial pressure (MAP) appropriate for the child's specific anatomy.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Blood &amp; Fluid Management: Executes precise fluid balance and titration of blood products and medications (e.g., TPN, inotropes, anticoagulants) due to low tolerance for volume shifts.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>pH-Stat vs. Alpha-Stat: Applies the correct acid-base</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	

management strategy (Alpha-Stat or pH-Stat) based on the patient's temperature and intended neurological protection goals (e.g., DHCA).			
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Item	Achieved	Not Achieved	Preceptor Signature
<b>ADVANCED PEDIATRIC TECHNIQUES</b>			
<ul style="list-style-type: none"> <li>Independently manages the cooling, circulatory arrest, and rewarming phases, including cerebral oximetry monitoring.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Cardioplegia: Prepares and administers high potassium/high-volume (e.g., del Nido) or specialized pediatric cardioplegia protocols and delivery systems.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Mechanical Support: Proficiently sets up, initiates, manages, and terminates Pediatric/Neonatal ECMO (V-A and V-V), including circuit troubleshooting and transport protocols.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Ventricular Assist Devices (VADs): Experience with pediatric VADs (e.g., Berlin Heart, PediMAG/CentriMag) and supporting heart transplant procedures (if applicable)</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>SAFETY &amp; PROFESSIONALISM</b>			
<ul style="list-style-type: none"> <li>Rapidly identifies and manages pediatric-specific crises (e.g., acute circuit thrombosis, severe hypocalcemia/electrolyte derangement, or power failure).</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Maintains meticulous and detailed records, particularly concerning minimal volume changes, drug dosages, and patient temperature gradient control.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Inter-Team Communication: Consults effectively with the Pediatric Cardiologist and Critical Care teams.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>POST-PROCEDURE CARE</b>			
<ul style="list-style-type: none"> <li>Hemostasis &amp; Reversal of Anticoagulation</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Hemodynamic Stabilization</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Monitoring for Complications</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Ensure complete handover of all intra-operative documentation to the designated postoperative care team.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	

Item	Achieved	Not Achieved	Preceptor Signature
<b>ADVANCED PEDIATRIC TECHNIQUES</b>			
<ul style="list-style-type: none"> <li>Independently manages the cooling, circulatory arrest, and rewarming phases, including cerebral oximetry monitoring.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Cardioplegia: Prepares and administers high potassium/high-volume (e.g., del Nido) or specialized pediatric cardioplegia protocols and delivery systems.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Mechanical Support: Proficiently sets up, initiates, manages, and terminates Pediatric/Neonatal ECMO (V-A and V-V), including circuit troubleshooting and transport protocols.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Ventricular Assist Devices (VADs): Experience with pediatric VADs (e.g., Berlin Heart, PediMAG/CentriMag) and supporting heart transplant procedures (if applicable)</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>SAFETY &amp; PROFESSIONALISM</b>			
<ul style="list-style-type: none"> <li>Rapidly identifies and manages pediatric-specific crises (e.g., acute circuit thrombosis, severe hypocalcemia/electrolyte derangement, or power failure).</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Maintains meticulous and detailed records, particularly concerning minimal volume changes, drug dosages, and patient temperature gradient control.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Inter-Team Communication: Consults effectively with the Pediatric Cardiologist and Critical Care teams.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>POST-PROCEDURE CARE</b>			
<ul style="list-style-type: none"> <li>Hemostasis &amp; Reversal of Anticoagulation</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Hemodynamic Stabilization</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Monitoring for Complications</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> <li>Ensure complete handover of all intra-operative documentation to the designated postoperative care team.</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	

This table is to be filled by students:

Student Name \_\_\_\_\_ Sign. \_\_\_\_\_ Date \_\_\_\_\_

<b>Pediatric cardiac Perfusion Rotation EVALUATION</b>	<b>Always (5)</b>	<b>Usually (4)</b>	<b>Sometimes (3)</b>	<b>Seldom (2)</b>	<b>Never (1)</b>
<ul style="list-style-type: none"> <li>▪ Did you clearly understand what was expected of you?</li> </ul>					
<b>COMMENTS:</b>					
<ul style="list-style-type: none"> <li>▪ Was supervision available to you in case you needed help in the middle of a procedure?</li> </ul>					
<b>COMMENTS:</b>					
<ul style="list-style-type: none"> <li>▪ Was the OR preceptor responsive to your questions?</li> </ul>					
<b>COMMENTS:</b>					
<ul style="list-style-type: none"> <li>▪ Did you have enough opportunity to demonstrate your knowledge and skill?</li> </ul>					
<b>COMMENTS:</b>					
<ul style="list-style-type: none"> <li>▪ Were the expectations appropriate for your level of training?</li> </ul>					
<b>COMMENTS:</b>					
<ul style="list-style-type: none"> <li>▪ Was the communication with your supervisor sufficient to meet your needs?</li> </ul>					
<b>COMMENTS:</b>					

## APPENDIX 8

### Contacts of Training Affairs at College of Applied Medical Sciences

<b>Vice dean for training affairs</b>	<p><b><i>Dr Matar Abdullah Alzahrani</i></b></p> <p>Phone 1: 0133331266 Phone 2: 0133331206 Fax: 0133330226</p> <p><a href="mailto:vdtraining.cams@iau.edu.sa">Email: vdtraining.cams@iau.edu.sa</a></p>
<b>Internship and training coordinator</b>	<p><b><i>Dr. Mostafa Hamed Rashed</i></b></p> <p>Phone: 0133331218 Mobile: 0542446162</p> <p><a href="mailto:mhrashed@iau.edu.sa">Email: mhrashed@iau.edu.sa</a></p> <p><b><i>Dr. Mohammad Yahya</i></b></p> <p>Mobile: 0545621472</p> <p><a href="mailto:myabdullah@iau.edu.sa">Email: myabdullah@iau.edu.sa</a></p>
<b>Internship affairs website</b>	<p><a href="https://www.iau.edu.sa/en/colleges/college-of-applied-medical-sciences/vice-deanships/vice-deanship-of-training-affairs">https://www.iau.edu.sa/en/colleges/college-of-applied-medical-sciences/vice-deanships/vice-deanship-of-training-affairs</a></p>
<b>Internship affairs email</b>	<p><a href="mailto:vdtraining.cams@iau.edu.sa">Email: vdtraining.cams@iau.edu.sa</a></p>
<b>Vice dean for training mailing address</b>	<p>Vice Dean for Training Affairs College of Applied Medical Sciences Imam Abdulrahman Bin Faisal University. P.O. Box 2435 Dammam 31451</p>



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IMAM ABDULRAHMAN BIN FAISAL UNIVERSITY

وحدة هوية الجامعة Brand Management Unit