DEPARTMENTAL FILE

The Department of Cardiology, MTI–Hayatabad Medical Complex, is a tertiary-care academic unit providing comprehensive cardiovascular services, including general and subspecialty cardiology, interventional procedures, electrophysiology, pediatric cardiology, and stroke interventions. The department supports these services through dedicated CCU, HDU, wards, and advanced diagnostic facilities. Alongside clinical care, the department is actively involved in undergraduate and postgraduate training, research, clinical audits, and quality-improvement initiatives. Standard Operating Procedures guide clinical and academic activities to ensure evidence-based practice and patient safety. This document outlines the departmental structure, scope of services, academic programs, research activities, and strategic direction.

Department: Cardiology
Division: Cardiology

Vision & Mission of the Department / Division

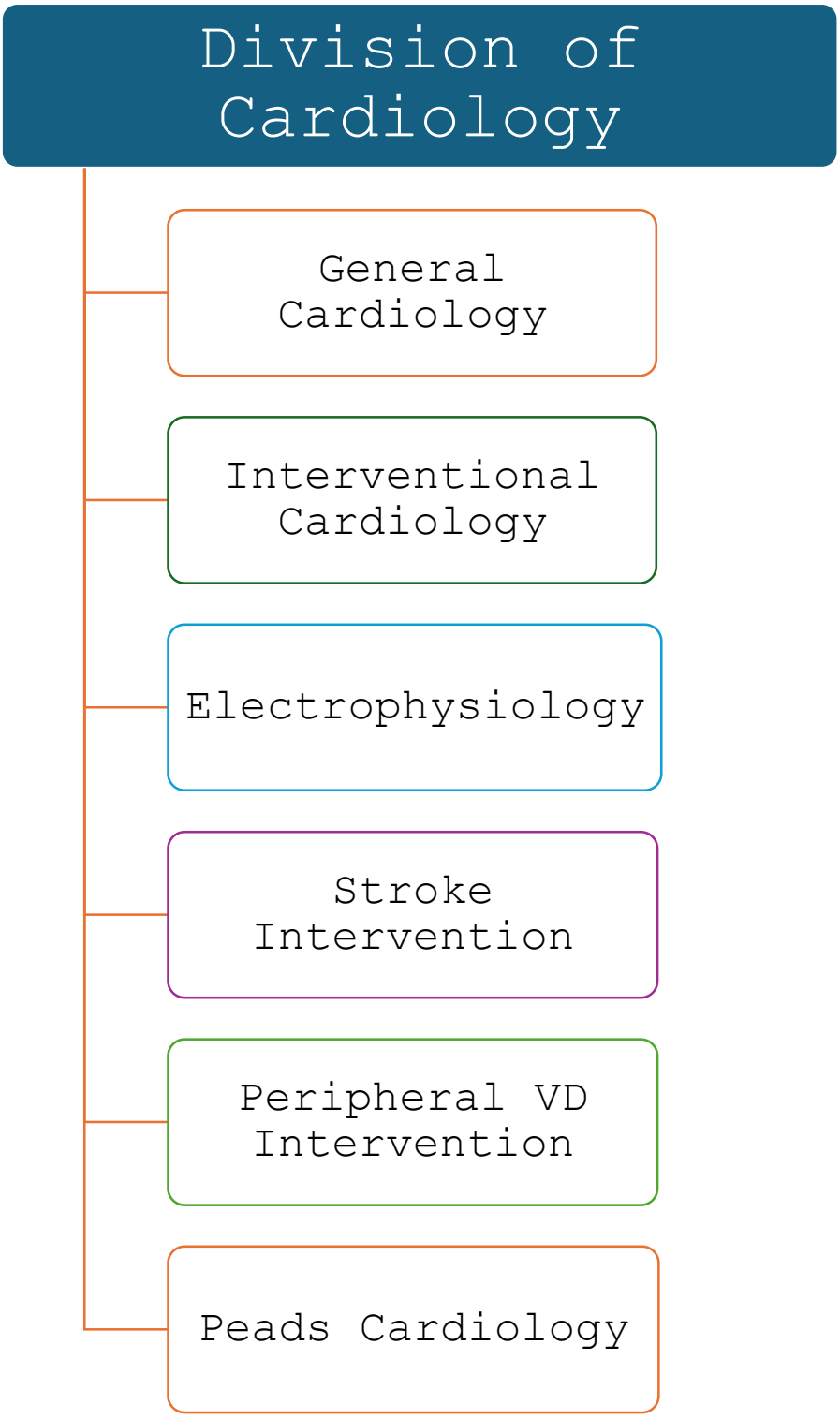
Vision

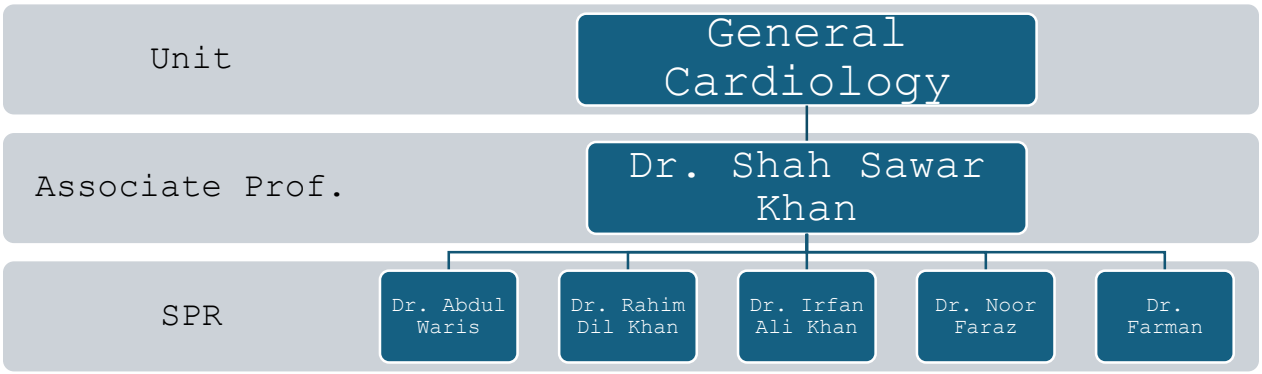
To be a leading cardiology department delivering excellence in patient-centered cardiovascular care, advanced training, and impactful research, while upholding the highest standards of ethics, professionalism, and clinical governance.

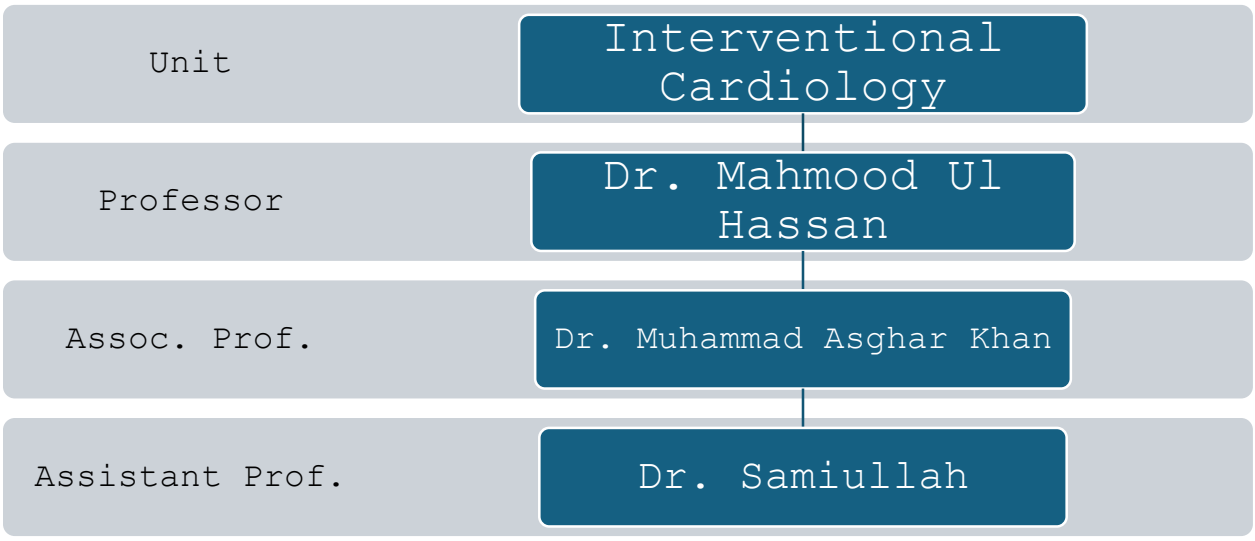
Mission

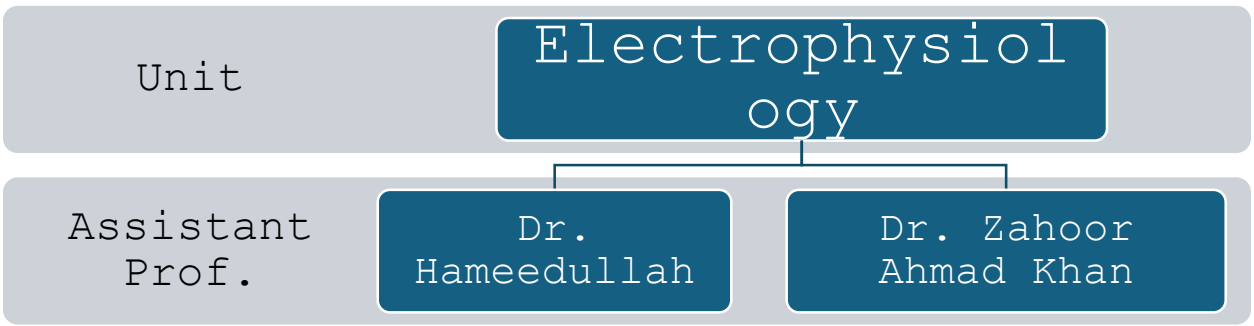
- To provide safe, timely, and evidence-based cardiovascular care across all subspecialties, ensuring optimal clinical outcomes and patient satisfaction.
- To deliver structured undergraduate and postgraduate education through competency-based training, supervised clinical exposure, and continuous academic activities.
- To promote research, clinical audits, and quality-improvement initiatives aimed at advancing cardiovascular practice and healthcare delivery.
- To foster a collaborative, multidisciplinary working environment that supports professional development, innovation, and accountability.
- To align departmental services and training with national regulatory requirements and international best practices.

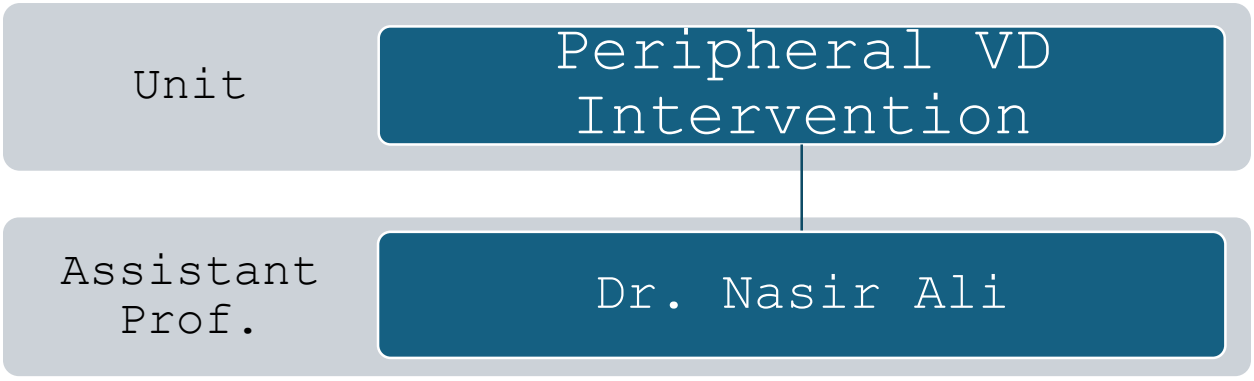
Departmental/ Divisional Organogram

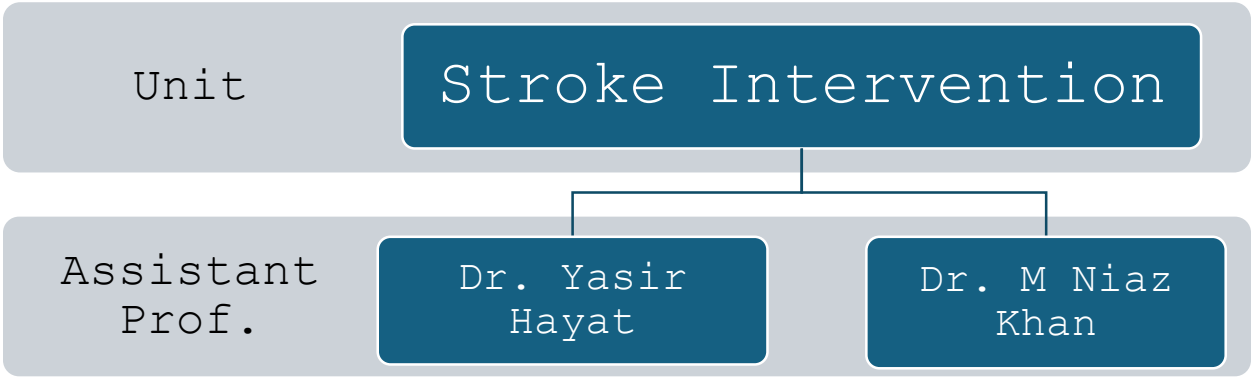


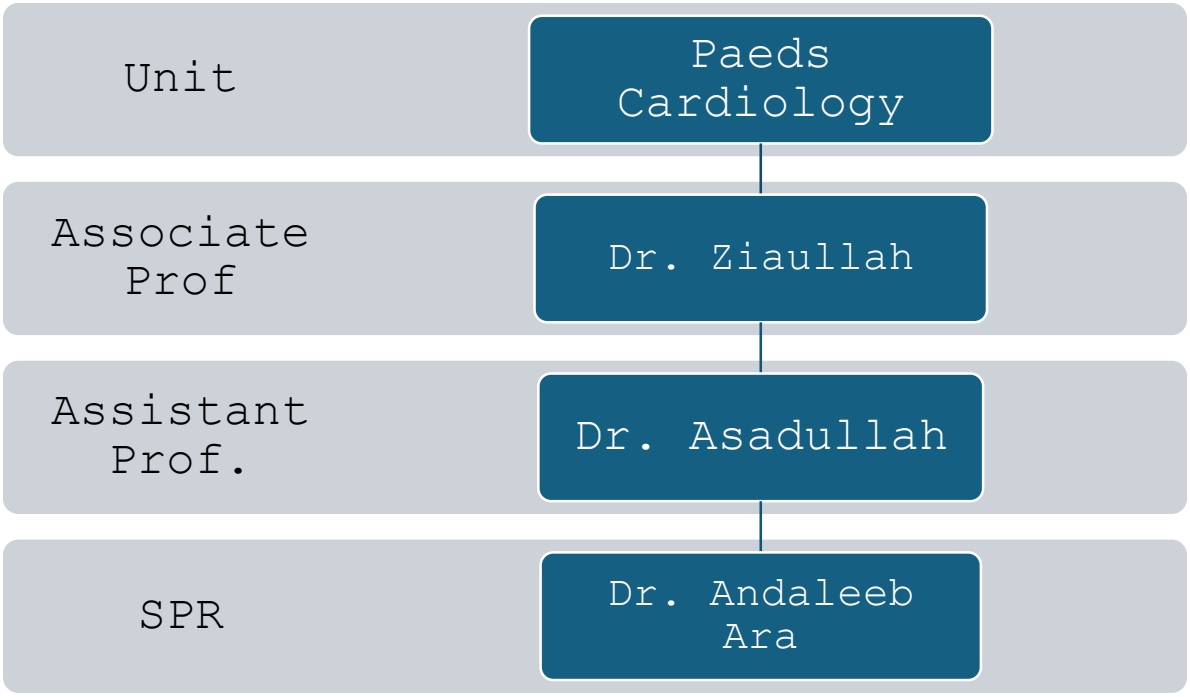

Unit
General Cardiology
Associate Prof.
Dr. Shah Sawar Khan
SPR
Dr. Abdul Waris
Dr. Rahim Dil Khan
Dr. Irfan Ali Khan
Dr. Noor Faraz
Dr. Farman


Unit
Interventional Cardiology
Professor
Dr. Mahmood Ul Hassan
Assoc. Prof.
Dr. Muhammad Asghar Khan
Assistant Prof.
Dr. Samiullah


Unit
Electrophysiology
Assistant Prof.
Dr. Hameedullah
Dr. Zahoor Ahmad Khan


Unit
Peripheral VD Intervention
Assistant Prof.
Dr. Nasir Ali


Unit
Stroke Intervention
Assistant Prof.
Dr. Yasir Hayat
Dr. M Niaz Khan



Scope of Services

Overview of Services

The burden of cardiovascular (CV) disease in our community is extremely high. This includes chronic and debilitating conditions such as heart failure, chronic stable angina, hypertension, and rheumatic heart disease. Acute cardiovascular emergencies commonly encountered include acute coronary syndrome, sudden cardiac death, hypertensive emergencies, cardiac tamponade, pulmonary embolism, acute stroke, cardiac arrhythmias, and heart block.

Pediatric and congenital heart diseases also constitute a significant clinical burden, with many patients presenting in critical condition. Pediatric cardiology services are limited within the province and are currently available only in Peshawar.

The universal availability of the Sehat Sahulat Card has resulted in a substantial increase in patient inflow to tertiary care hospitals, particularly for emergency and elective cardiac procedures. Consequently, the Cardiology Department is operating under significant workload pressure. Despite limited human resources, especially trained interventional specialists, all 119 cardiac beds remain fully occupied on a daily basis.

Notwithstanding these constraints, the Department of Cardiology continues to provide comprehensive preventive, curative, therapeutic, and interventional cardiac services as outlined below.

Current Services Offered

1. 24/7 emergency admission for adult and pediatric cardiac patients
2. Five days a week outpatient services for stable cardiac patients, with admission as required
3. Primary percutaneous coronary intervention (PCI)
4. Elective coronary angiography and angioplasty
5. Percutaneous transvenous mitral commissurotomy (PTMC)
6. Diagnostic cardiac catheterization
7. Electrophysiological studies and radiofrequency ablation
8. Cardiac implantable electronic device implantation (PPM, ICD, CRT)
9. Cardiac magnetic resonance imaging (CMR)
10. Cardiac computed tomography (CT)
11. Transthoracic, transesophageal, and stress echocardiography for adults and pediatric patients
12. ECG, Holter monitoring, ambulatory blood pressure monitoring, exercise tolerance testing (ETT), and signal-averaged ECG
13. Pacemaker interrogation/programming
14. Intra-aortic balloon pump (IABP) services provided daily by seven consultants
15. Primary PCI services for acute coronary syndromes

Hours of Service Provision

1. 24-hour emergency services through the Coronary Care Unit (CCU)
2. 24-hour ECG services via the Emergency Department
3. Primary PCI services up to 24 hours
4. Elective cardiac catheterization services, five days a week (8 hours daily)
5. Pacemaker implantation services, five days a week (8 hours daily)
6. Echocardiography and ETT services, five days a week (12 hours daily)
7. Electrophysiology and radiofrequency ablation services, three days a week (8 hours daily)

Planned Services

1. Provision of 24/7 primary PCI services, subject to uninterrupted Sehat Sahulat facilitation, to maintain optimal door-to-balloon times
2. Expansion of Holter monitoring and ambulatory blood pressure monitoring services to at least 12 hours daily
3. Recruitment of highly skilled interventional cardiologists, stroke interventionists, structural heart specialists, and cardiac imaging experts
4. Advanced training of medical staff in cardiac imaging, structural heart interventions, peripheral interventions, stroke interventions, ventricular tachycardia ablation, and cryoablation

Departmental SOPs (Patient care)

Introduction

The Cardiology Department at Medical Teaching Institution Hayatabad Medical Complex (MTI HMC) is dedicated to delivering exceptional cardiovascular care through

standardized processes. This booklet of Standard Operating Procedures (SOPs) provides detailed, step-by-step instructions to ensure consistency, safety, and quality in patient management, diagnostics, and staff training.

Purpose

- To standardize clinical and operational protocols across the department.
- To enhance patient outcomes through efficient and evidence-based practices.
- To serve as a comprehensive guide for all cardiology personnel.

Scope

These SOPs apply to all staff within the Cardiology Department, including physicians, nurses, sonographers, support staff, and trainees.

1: Chest Pain Unit (CPU)

1.1 Introduction

The Chest Pain Unit (CPU), located in Room 6, is designed for the rapid evaluation and management of patients with chest pain or suspected Acute Coronary Syndrome (ACS). This chapter integrates general CPU protocols with specific ACS management procedures to streamline care delivery.

1.2 Triage and Patient Admission

- **Triage System**: The Emergency Department (ER) employs a triage system managed by a registered nurse to prioritize patients with suspected ACS.
- **Admission:** Patients with chest pain bypass the CMO room and are directed to the CPU.
- **Documentation**: Record the exact time of patient arrival in the CPU.

1.3 Initial Assessment and Screening for ACS

- **History Taking:**
    - Document chest pain details: onset, duration, intensity, character, and associated symptoms (e.g., shortness of breath, nausea, sweating).
    - Record past medical history and risk factors (e.g., hypertension, diabetes, smoking).
- **Physical Examination:**
    - Assess vital signs (blood pressure, heart rate, oxygen saturation).
    - Perform a cardiovascular exam focusing on heart sounds and signs of heart failure.
- **Electrocardiogram (ECG):**

    - Conduct an immediate bedside ECG (free of charge) or standard ECG from Room 9.
    - Perform serial ECGs every 15-30 minutes if initial results are non-diagnostic.
- **Laboratory Tests:**
    - Order high-sensitivity cardiac troponins (initial and serial).
    - Request complete blood count (CBC) and basic metabolic panel (BMP).

1.4 Diagnosis and Management of ACS

- **Diagnosis:**
    - **STEMI**: ST-segment elevation on ECG.
    - **NSTEMI**: Elevated troponins without ST-elevation.
    - **Unstable Angina**: Symptoms without biomarker elevation.
- **Immediate Management:**
    - **Medications:**
        - **Aspirin**: 300 mg orally.
        - **Clopidogrel**: 600 mg or Ticagrelor: 180 mg orally.
        - **Unfractionated heparin**: Dosage per physician order (document administration time).
        - **Statin**: 20 mg orally.
        - **Painkillers**: Type, dose, and timing as prescribed.
    - **IV Access:** Place an intravenous line in the left arm.
    - **Immobilization:** For STEMI patients, immobilize on a stretcher and transfer to the resuscitation room.

1.5 Bed Availability and Coordination

- **CCU Coordination**: The CPU resident must contact the CCU resident to confirm bed availability.
- **Prioritization**: Assess urgency based on clinical condition.
- **Interim Plan**: If no bed is available, consult the on-duty Specialist Registrar (SPR) for an interim care strategy.
- **Log Maintenance**: Keep an updated record of CCU bed availability.

1.6 Seeking Guidance and Consultation

- **Consultation Process:**
    - If diagnostic or management challenges arise, immediately consult the intervention fellow and SPR.
    - Provide a detailed summary of patient history, test results, and clinical findings.
- **Collaboration**: Work with the fellow and SPR to finalize the treatment plan.

1.7 Patient Transfer Protocols

- **Preparation:**
  - Compile all documentation (history, ECGs, labs, treatments).
  - Verify CCU bed availability or Cath Lab readiness.
  - Brief the patient's attendant on the transfer plan.
- **Transfer Procedure:**
  - Ensure patient stability with nursing support.
  - Accompany high-risk patients (hemodynamic/electrical instability) to CCU or Cath Lab.
  - Provide a verbal handover to the receiving team.
- **Direct Transfer to Cath Lab:**
  - **Criteria**: Acute STEMI (chest pain <12 hours, Killip Class 1 & 2), rescue PCI, suspected stent thrombosis, or severe NSTEMI chest pain.
  - **Steps**: Load with antiplatelets, obtain high-risk consent for PCI, explain the procedure to attendants, check Sehat Card eligibility, and notify the Cardiology Ward resident for admission.

1.8 Resident Station and Shift Handover

- **Duty Station:** Residents must remain in the CPU unless attending an emergency or directed otherwise.
- **Shift Handover:**
  - Deliver a comprehensive report to the incoming resident, covering patient status, treatments, and pending tasks.
  - Ensure all documentation is current and accessible.

1.9 Emergency Procedures

- **CPR and Resuscitation:**
  - Adhere to Advanced Cardiac Life Support (ACLS) protocols.
  - Document CPR initiation time, medications, defibrillations, and patient response.
- **Staff Readiness**: Ensure availability of resuscitation equipment.

1.10 Resource Allocation

- **Emergency Beds**: Reserve two beds in male and female chambers for emergencies.
- **Cath Lab Table**: Reserve one table for PCI upon ER request.

1.11 Communication

- Interdepartmental: Discuss all ACS patients with the on-call cardiology fellow and coordinate with ER, CCU, and Cath Lab staff.
- Goal: Achieve a door-to-balloon time of less than 60 minutes for STEMI patients.

1.12 Documentation Standards

- Records: Document arrival time, history, examination, ECG findings, lab results, treatments (including antiplatelets, heparin, painkillers), consents, and resuscitation events.
- Signatures: Residents must sign and stamp all entries.
- HMIS: Enter data into the Hospital Management Information System.

2: Acute Stroke Interventions Program

2.1 Introduction

This program, a collaboration between Cardiology and Neurology, provides mechanical thrombectomy for ischemic stroke patients with large vessel occlusion (LVO).

2.2 Stroke Interventions Team

- Dr. Muhammad Asghar Khan (Associate Professor of Cardiology)
- Dr. Mian Ayaz Ul Haq (Assistant Professor & Head of Neurology)
- Dr. Muhammad Niaz Khan (Assistant Professor of Cardiology)
- Dr. Yasir Hayat (Assistant Professor of Cardiology)
- Dr. Owais Khan (Specialist Registrar Neurology)
- Dr. Muhammad Danish (Specialist Registrar Neurology)
- Additional staff to be added as needed.

2.3 Patient Selection

- **Eligible Patients:**
  - Ischemic stroke within thrombolysis window with LVO on CT Angiogram (CTA).
  - Ineligible for thrombolysis but within favorable time window and NIHSS score for mechanical thrombectomy.
- **Consultation Required:**
  - NIHSS score >16.
  - ASPECTS score <6.

2.4 Time Frame for Case Selection

- **<4.5 Hours:** Eligible for thrombolysis and thrombectomy.
- **4.5-6 Hours**: Eligible with favorable NIHSS and ASPECTS scores.

- **6-12 Hours**: Assess by ASPECTS score.
- **12-24 Hours**: Assess by ASPECTS and clinical status.
- **>24 Hours**: Not eligible; manage conservatively until CT Perfusion is available.

2.5 Patient Shifting to Cath Lab

- **Process:**
  - Receive patient in ER; shift to CT scan to rule out hemorrhage.
  - Administer tPA if eligible, then perform CTA.
  - Transfer to CRC 3rd floor Cath Lab after notifying the stroke team.
- **Post-Procedure:**
  - Monitor in Stroke ICU (CRC) for 24 hours.
  - Neurologist determines further care (Stroke ICU or Neurology Ward).
  - Perform CT scans immediately and 24 hours post-procedure.

2.6 Medications

- **Before Procedure**: No antihypertensives, antiplatelets, beta-blockers, or anticoagulation (except tPA if eligible).
- **During Procedure**: Use only heparinized saline flush.
- **After Procedure**: Start single antiplatelet therapy (SAPT) and statin after 24 hours if no hemorrhage, per neurologist's plan.

2.7 Procedure Plan

- **Location**: CRC 3rd floor Phillips Cath Lab.
- **Availability**: Ensure table availability for stroke cases.
- **Technique:**
  - Femoral access with 6F sheath.
  - Diagnostic angiogram with Simmons 5F catheter.
  - Mechanical thrombectomy via ADAPT or SOLUMBRA technique.
  - Place carotid stents for tandem lesions.

2.8 Training of Junior Doctors

- Provide hands-on training to fellows and junior doctors for program continuity.

2.9 Human Resource Availability

- Establish a dedicated team of registrars, medical officers, nurses, and technical staff (to be finalized with administration).

2.10 Financial Management

- Explore funding via Sehat Card Scheme (SSC) or governmental/non-governmental support.

2.11 Data Collection

- Maintain detailed records (soft and hard copies) of procedures, consumables, costs, and outcomes.

3: Echocardiography Services

3.1 Purpose

To standardize echocardiographic examinations for accurate diagnosis and patient safety.

3.2 Scope

Applies to all personnel involved in echocardiography, including cardiologists, sonographers, and administrative staff.

3.3 Responsibilities

- Chairman Cardiology: Oversee compliance.
- Cardiologists/Echocardiographers: Perform and interpret exams.
- Sonographers: Conduct imaging.
- Administrative Staff: Manage scheduling and records.
- Transcriptionists: Enter data into HMIS.

3.4 Patient Preparation

- **Scheduling:**
  - Limit daily patients for quality.
  - Assign specific days for TEE and cardiac surgery patients.
- **Pre-Examination:**
  - Fasting: 4 hours for TEE.
  - Virology labs for TEE.
  - Advise regular medications unless contraindicated.
  - Request loose clothing and complete history.

3.5 Transthoracic Echocardiogram (TTE)

- **Preparation:**
  - Verify identity, explain procedure, obtain consent.
  - Position patient in left lateral decubitus.
  - Document area of interest (e.g., valves, chambers).

- **Imaging:**
  - Apply gel, obtain standard views (parasternal, apical, etc.).
  - Record measurements (e.g., LVEF, chamber sizes).
- **Post-Examination:**
  - Clean equipment and patient, provide follow-up instructions.

3.6 Transesophageal Echocardiogram (TEE)

- **Preparation:**
  - Confirm fasting and virology results, obtain consent.
  - Administer anesthetic/sedation, position patient.
- **Imaging:**
  - Insert probe, obtain views (esophageal, transgastric).
  - Monitor vitals.
- **Post-Examination:**
  - Remove probe, monitor recovery, restrict diet until anesthetic wears off.

3.7 Data Management and Reporting

- **Storage**: Archive images securely.
- **Reports**: Generate within 1 hour, reviewed by a cardiologist.
- **Transcription**: Enter data into HMIS.
- **Priority**: Expedite reports for OPD patients.

3.8 Quality Control

- Maintain equipment, train staff, conduct peer reviews, and address feedback.

3.9 Infection Control

- Follow hygiene protocols, disinfect equipment, and dispose of waste per guidelines.

3.10 Emergency Procedures

- Train staff in emergency response and Code Blue protocols.

3.11 Staff Scheduling

- Day Shift: 8 AM-4 PM (Saturdays off) or 8 AM-2 PM (Saturdays on).
- Evening Shift: 2 PM-8 PM.

4: Cardiology Ward and CCU

4.1 Introduction

This chapter outlines guidelines for managing patients in the Cardiology Ward and CCU, ensuring coordinated care among doctors, nurses, and support staff.

4.2 Guidelines for Doctors

- **Receiving Patients:**
  - Verify identity, history, and stability.
  - Assess need for PCI or CCU admission.
- **Bed Availability**: Confirm and prepare beds with equipment (ECG, defibrillator).
- **Sehat Card**: Activate insurance for treatment coverage.
- **DAPT**: Administer Aspirin (160-325 mg), Clopidogrel (600 mg), or Ticagrelor (180 mg).
- **Initial Management**: Obtain history, perform exam, secure IV, obtain consent for procedures.
- **ECG/Troponin**: Monitor ECG and test troponins serially.
- **Cath Lab Notification**: Alert for STEMI cases.
- **Bedside Procedures**: Maintain sterility for TPM or pericardiocentesis.
- **Emergency Management**: Follow ACLS for CPR.
- **Post-PCI Care**: Monitor for complications, adjust medications.
- **Shift Handover**: Communicate patient status and pending tasks.

4.3 Guidelines for Nurses

- **Key Responsibilities:**
  - Review patient history and care plan.
  - Prepare beds for incoming patients.
  - Order and perform lab work.
  - Verify Sehat Card.
  - Document in HMIS and manage files.
  - Assist in bedside procedures.
  - Maintain sterile equipment and emergency drugs.
  - Monitor ECG and vitals continuously.
  - Administer and document medications accurately.
  - Coordinate shift handover.

4.4 Guidelines for Class IV Staff

- **Attendant Policy**: Limit to one per patient.
- **Sehat Card Assistance**: Guide attendants in activation.
- **Transfers**: Assist in moving patients to CCU or Cath Lab.
- **Emergency Support**: Aid in urgent cases.

4.5 Doctor’s Checklist/Proforma

- Includes patient details, initial assessment, investigations, management, consents, transfer protocols, and handover notes (to be developed separately).

5: Cardiac Rehabilitation Center (CRC)

Introduction

The Cardiac Rehabilitation Center (CRC) is a core clinical facility of the Division of Cardiology, MTI-HMC, providing integrated cardiac patient care encompassing **general cardiology, interventional cardiology, electrophysiology, stroke intervention support, and post-procedural rehabilitation**. CRC ensures continuity of care from acute intervention to recovery and stabilization.

5.1 Physical Layout and Functional Distribution

CRC is organized into **three floors**, each with defined clinical responsibilities:

- **First Floor – General Cardiology Unit**
- **Second Floor – Electrophysiology Unit and High Dependency Unit (HDU)** *(HDU governed by separate approved SOP)*
- **Third Floor – Cardiac Catheterization Laboratories**
    - Coronary Angiography and PCI
    - Electrophysiology Studies and Device Implantation

5.2 CRC First Floor – General Cardiology Patient Care

Scope of Services

- Step-down care after CCU / HDU
- Post-PCI observation (hemodynamically stable patients)
- Heart failure optimization
- Non-critical arrhythmia monitoring
- Pre-procedure preparation and post-procedure recovery

Admission Criteria

- Stable cardiac patients
- Post-interventional patients requiring monitoring
- Patients transferred from CCU/HDU after stabilization

Patient Management Protocol

- Initial assessment within **30 minutes** of admission
- Daily consultant-led ward rounds
- Continuous ECG and vital sign monitoring

- Medication optimization as per guidelines
- Documentation in patient file and HMIS

5.3 CRC Second Floor – Electrophysiology Patient Care

Services Provided

- Permanent pacemaker (PPM) implantation
- ICD, CRT-P, CRT-D implantation
- Electrophysiological studies
- Post-device monitoring and recovery

Pre-Procedure Care

- Indication confirmation by EP consultant
- Sehat Card/payment verification
- Written informed consent
- Baseline ECG, echocardiography, laboratory investigations

Post-Procedure Care

- Continuous telemetry monitoring
- Wound and access-site inspection
- Device interrogation before discharge
- Issuance of device identification card
- Discharge planning with follow-up schedule

CRC Third Floor – Cardiac Catheterization & EP Laboratories

Services

- Diagnostic coronary angiography
- Percutaneous coronary intervention (PCI)
- Primary PCI for STEMI
- Electrophysiology studies
- Emergency and elective device implantation

Pre-Procedure Protocol

- Patient identification and verification
- Focused clinical assessment
- Review of laboratory investigations
- Antiplatelet/anticoagulation preparation as indicated
- Maintenance of NPO status

Intra-Procedure Care

- Strict aseptic technique
- Continuous ECG, blood pressure, and oxygen monitoring
- Radiation safety compliance
- Real-time documentation of procedural details and complications

Post-Procedure Disposition

- **Stable patients:** CRC First Floor
- **EP device patients:** CRC Second Floor
- **Unstable/high-risk patients:** HDU or CCU

5.4 Patient Transfer and Handover

- All inter-floor transfers must include:
  - Written transfer note
  - Verbal handover to receiving team
- HDU escalation strictly as per HDU SOP
- Emergency deterioration to be escalated immediately to on-call consultant

5.5 Infection Control and Safety

- Mandatory hand hygiene
- Sterile technique for all invasive procedures
- Daily cleaning of CRC patient areas and procedure suites
- Biomedical waste disposal as per hospital policy

6: Training Program for Interventional Cardiology Fellows

6.1 Introduction

This two-year program aligns with international standards, progressively building expertise in interventional cardiology.

6.2 Year 1: Junior Fellow

- **Objective**: Develop foundational skills.
- **Clinical Knowledge**:
  - Coronary anatomy, hemodynamics, pharmacology, radiation safety.
  - Interpret angiograms, basics of IVUS, OCT, FFR, iFR.
- **Procedural Skills**:
  - Perform 50-100 supervised angiograms.
  - Assist in 50-100 PCIs (balloon angioplasty, stenting).
  - Learn equipment handling and complication management.

- **Rotations**: Cath Lab, ICU/CCU, consultations.
- **Didactics**: Weekly conferences, BLS/ACLS certification, research participation.

6.3 Year 2: Senior Fellow

- **Objective**: Achieve autonomy in complex interventions.
- **Advanced Knowledge**:
  - Multivessel PCI, CTO, heart team decisions, imaging mastery.
  - Mechanical support (IABP, Impella, ECMO).
- **Procedural Skills**:
  - Perform 150-200 PCIs independently.
  - Master bifurcation, CTO, atherectomy, and complication management.
  - Optional exposure to structural interventions.
- **Rotations**: Advanced Cath Lab, hybrid OR, electives.
- **Research & Education**: Conduct research, mentor juniors, attend workshops.
- **Evaluation**: Monthly reviews, final competency assessment.

7: Permanent Pacemaker (DDDR + VVIR) Implantation

1. Patient who needs permanent Pacemaker (DDDR + VVIR) shall be indigenous to MTI-HMC.
2. Every patient who will be provided permanent Pacemaker (DDDR + VVIR) shall route through ER to CCU/CRC.
3. After advised by consultant EP the PPM will be provided to Sehat Card Patient. The institute will bear the extra amount, the pharmacist will ensure to attach the copy of the PUC approved by the competent authority.
4. For patient who are ineligible to Sehat Card will get the pacemaker on payment after following protocol.
5. No referred cases from other hospitals will be entertained.
6. The consultant EP in IBP can decide for permanent Pacemaker (DDDR + VVIR) to any patient who visits IBP on payment. However, for Sehat Card cases the patient has to follow the routine of admission to ER and consequent steps.

For every Sehat card patient, it will be mandatory for the consultant to ensure that he/she is very deserving and poor since it involve the exchequer money which would need justification.

8: High Dependency Unit (HDU)

1. Introduction

These guidelines outline the operational protocols for the 8-bed Cardiology High Dependency Unit (HDU), located within the 2nd Floor CRC Department, to ensure standardized, high-quality care for patients with critical cardiac conditions and select neurological conditions requiring close monitoring. The HDU serves as an intermediate care unit for patients requiring intensive monitoring and management, including those deteriorating within the cardiology Department, post-procedure from the catheterization laboratory (Cath lab), or post-mechanical thrombectomy for stroke, but not requiring full intensive care unit (ICU) support.

2. Admission Criteria

As per local HDU guidelines, patients requiring HDU admission must meet the eligibility criteria before being admitted, and this should be confirmed by the Specialist Registrar (SPR) or on-call Consultant. Patients eligible for admission to the Cardiology HDU must meet one or more of the following criteria:

- Acute coronary syndrome (ACS) with ongoing chest pain, hemodynamic instability, or high-risk features (e.g., dynamic ECG changes, elevated troponin levels).
- Heart failure with respiratory distress, requiring non-invasive ventilation or inotropic support.
- Arrhythmias requiring continuous monitoring or urgent intervention (e.g., ventricular tachycardia, symptomatic bradycardia).
- Post-procedural monitoring after complex cardiac interventions (e.g., percutaneous coronary intervention, transcatheter aortic valve replacement).
- Cardiogenic shock requiring close monitoring but not mechanical circulatory support.
- **Deterioration within the cardiology ward:** Patients in the cardiology ward showing signs of clinical deterioration (e.g., worsening heart failure, new-onset arrhythmias, or hemodynamic instability) requiring escalated care.
- **Post-cath lab complications:** Patients who develop serious complications during or immediately after procedures in the cath lab (e.g., hemodynamic instability, arrhythmias, or acute vessel closure) requiring intensive monitoring.
- **Post-mechanical thrombectomy for stroke:** Patients who have undergone mechanical thrombectomy for acute ischemic stroke, requiring close monitoring for 24–72 hours, depending on clinical stability, neurological status, and consultant recommendation.
- Other cardiac or related conditions requiring intensive monitoring, as determined by the attending cardiologist or neurologist (for stroke patients).

Exclusion Criteria

- Patients requiring mechanical ventilation or advanced mechanical circulatory support (e.g., ECMO, intra-aortic balloon pump) should be transferred to the ICU.
- Non-cardiac primary diagnoses requiring specialized care (e.g., sepsis, acute renal failure) unless cardiology or neurology consultation deems HDU appropriate.

3. Daily Monitoring and Laboratory Investigations

Vital Signs Monitoring

- Continuous monitoring of:
    - Heart rate and rhythm (via telemetry).
    - Blood pressure (non-invasive or invasive, as indicated).
    - Oxygen saturation (SpO2).
    - Respiratory rate.
    - Temperature (every 6 hours or as clinically indicated).
- Hourly urine output monitoring for patients on diuretics or with renal concerns.
- **For post-mechanical thrombectomy patients:** Neurological assessments (e.g., Glasgow Coma Scale, NIH Stroke Scale) every 4 hours or as directed by the neurologist.

Daily Laboratory Tests

- **Complete Blood Count (CBC):** To monitor for anemia, infection, or hematological abnormalities.
- **Electrolytes (Na, K, Mg, Ca):** To assess for imbalances, especially in patients on diuretics, antiarrhythmics, or post-thrombectomy medications.
- **Renal Function Tests (RFTs):** Serum creatinine and blood urea nitrogen to monitor kidney function.
- **Cardiac Biomarkers:** Troponin I/T and/or CK-MB in patients with suspected ACS, ongoing ischemia, or post-cath lab complications (frequency as per cardiologist's discretion).
- **BNP/NT-proBNP:** For patients with heart failure to assess severity and treatment response (as indicated).
- **Coagulation Profile (PT/INR, aPTT):** For patients on anticoagulants or with suspected coagulopathy, especially post-cath lab or post-thrombectomy.
- **Liver Function Tests (LFTs):** For patients on medications with hepatic metabolism (e.g., amiodarone) or suspected right heart failure.

- **Blood Glucose:** For diabetic patients, those on inotropic support, or post-thrombectomy patients (every 4-6 hours if unstable).
- **Arterial Blood Gas (ABG):** For patients with respiratory compromise or prior to initiating non-invasive ventilation (see Section 4.3).
- **Blood Culture and Sensitivity (CS) and Urine Culture and Sensitivity (CS):** To be sent only after discussion and approval by the primary consultant in cases of suspected infection.

Additional Tests

- **ECG:** Mandatory daily for all HDU patients to monitor for arrhythmias, ischemic changes, or post-cath lab complications.
- **Echocardiography:** Mandatory daily for all HDU patients to assess cardiac function or structural abnormalities.
- **Chest X-ray:** Performed bedside using a portable X-ray machine for patients with heart failure, pulmonary edema, or suspected infection, as ordered by the cardiologist.
- **For post-mechanical thrombectomy patients:** CT brain or MRI as per neurologist's recommendation to monitor for reperfusion injury or hemorrhagic transformation.

4. Patient Management Protocols

General Management

- All patients must have an individualized care plan developed by the cardiology or neurology team within 6 hours of admission.
- Multidisciplinary rounds (cardiologist, neurologist for stroke patients, HDU nurse, pharmacist, respiratory therapist) to be conducted daily at 8:00 AM and 8:00 PM.
- Infection control measures: Stable adherence to hand hygiene, sterile techniques for invasive procedures, and daily assessment for catheter-associated infections.

Medication Administration

- Administer medications as prescribed, with special attention to:
    - Antiplatelets/anticoagulants (e.g., aspirin, clopidogrel, heparin), especially for post-cath lab or post-thrombectomy patients.
    - Antiarrhythmics (e.g., amiodarone, beta-blockers).
    - Inotropes/diuretics for heart failure or cardiogenic shock.

    - **For post-mechanical thrombectomy patients:** Administer antiplatelets (e.g., aspirin, clopidogrel) or anticoagulants as per neurologist's protocol, and monitor for bleeding risks.
- Document all medication administrations in the electronic medical record (EMR) with time, dose, and route.
- Monitor for adverse drug reactions and report immediately.

Non-Invasive Ventilation (NIV)

- **Indications:** Acute pulmonary edema, cardiogenic respiratory distress.
- **Pre-Initiation Assessment:** Perform arterial blood gas (ABG) analysis prior to starting NIV to determine the need for CPAP or BiPAP and repeat the ABGs after one hour.
- **Settings:** Adjust settings (CPAP or BiPAP) by respiratory therapist in consultation with the cardiologist based on ABG results and clinical status.
- **Monitoring:**
    - Monitor SpO2, respiratory rate, and patient comfort every 2 hours.
    - Repeat ABG 1 hour after initiating NIV to assess patient response and adjust settings as needed.
- **Sedation:** Do not administer sedatives to patients on NIV to avoid respiratory depression.
- **Documentation:** Record NIV settings, ABG results, and patient response in the EMR.

5. Patient Shifting Management

Transfer to HDU

- **From Cardiology Ward:**
    - For patients deteriorating within the cardiology ward, assess for HDU admission criteria (e.g., worsening vital signs, new arrhythmias, or escalating oxygen requirements).
    - Notify the HDU team and cardiology consultant immediately.
    - Complete handover form, including recent labs, ECG, and clinical status.
    - Transport with cardiac monitor, oxygen support, and HDU nurse escort.
- **From Cath Lab:**

- For patients developing serious complications during or after cath lab procedures (e.g., hemodynamic instability, arrhythmias, or vascular complications), immediate transfer to HDU is warranted.
- Ensure pre-transfer stabilization (e.g., control of bleeding at access site, initiation of inotropes if needed).
- Cath lab team to provide a detailed handover, including procedure details, complications, and medications administered.
- Transport with cath lab nurse, portable defibrillator, and emergency medications.

- **From Interventional Radiology (Post-Mechanical Thrombectomy):**
  - Patients post-mechanical thrombectomy for acute ischemic stroke to be admitted to HDU for 24–72 hours, based on clinical stability, neurological status, and consultant recommendation.
  - Ensure pre-transfer stabilization (e.g., blood pressure control, monitoring for neurological deterioration).
  - Interventional radiology team to provide a detailed handover, including procedure details, reperfusion status, and medications administered (e.g., antiplatelets).
  - Transport with neurology or interventional radiology nurse, portable monitor, and emergency medications.

Transfer Out of HDU

- **To General Ward:**
  - Patient must be hemodynamically stable for 24 hours (no inotropes, stable vital signs, no active ischemia).
  - For post-mechanical thrombectomy patients, neurological stability (e.g., stable NIH Stroke Scale, no evidence of hemorrhagic transformation) for 24–72 hours, as determined by the neurologist.
  - No ongoing need for continuous telemetry or NIV.
  - Cardiology or neurology consultant approval required.
  - Complete discharge summary and handover to ward team.
- **To ICU:**
  - Indications: Deterioration requiring mechanical ventilation, multi-organ failure, advanced circulatory support, or neurological deterioration (e.g., post-thrombectomy hemorrhage).

- Immediate consultation with ICU team, cardiologist, or neurologist.
- Transport with critical care nurse, portable ventilator (if applicable), and emergency medications.

- **To Cath Lab:**
  - Ensure patient is loaded with aspirin and a P2Y12 inhibitor (e.g., clopidogrel, ticagrelor) as per protocol prior to transfer for urgent procedures (e.g., PCI, pacemaker insertion).
  - Complete pre-procedure checklist (NPO status, consent, labs).
  - Accompany with HDU nurse and portable defibrillator.

Inter-Hospital Transfer

- For patients requiring specialized care (e.g., cardiac surgery, advanced stroke care), coordinate with the receiving facility.
- Provide detailed transfer summary, including recent labs, imaging, procedure details (cath lab or thrombectomy), and medication history.
- Ensure transport with advanced life support (ALS) ambulance and trained personnel.

6. Staffing and Training

- **Staffing Ratios:**
  - Nurse-to-patient ratio: 1:2 during all shifts.
  - One cardiology resident, one neurologist (for stroke patients), and one consultant available 24/7.
  - Respiratory therapist and pharmacist available on-call.
- **Training Requirements:**
  - All HDU staff must complete Advanced Cardiac Life Support (ACLS) certification.
  - Annual training on telemetry interpretation, NIV management (including ABG interpretation), neurological assessments (e.g., NIH Stroke Scale), and emergency protocols, including management of post-cath lab and post-thrombectomy complications.
  - Monthly simulation drills for cardiac arrest, acute decompensation, cath lab-related emergencies, and post-thrombectomy neurological deterioration.

7. Documentation

- All clinical observations, interventions, and communications must be recorded in the EMR.
- Daily progress notes by the cardiology or neurology team, including:
    - Summary of clinical status, including any cath lab complications, ward deterioration, or post-thrombectomy neurological status.
    - Changes in management plan.
    - Response to therapy, including NIV response with ABG results or neurological assessments.
- Nursing documentation to include:
    - Hourly vital signs and intake/output.
    - Neurological assessments (e.g., NIH Stroke Scale) every 4 hours for post-thrombectomy patients.
    - Medication administration times, including cath lab-related medications (e.g., aspirin, P2Y12 inhibitors) and post-thrombectomy antiplatelets.
    - Any adverse events or patient concerns.

8. Quality Assurance and Safety

- Daily equipment checks (monitors, defibrillators, NIV machines, portable X-ray machine) to ensure functionality.
- Weekly audits of infection control practices, medication errors, cath lab transfer protocols, and post-thrombectomy care protocols.
- Monthly morbidity and mortality reviews to identify areas for improvement, including cases from cath lab complications and post-thrombectomy outcomes.
- Patient and family feedback to be collected at discharge to assess satisfaction and care quality.

9. Emergency Protocols

- **Cardiac Arrest:**
    - Initiate ACLS protocol immediately.
    - Designate a code leader (senior resident or consultant).
    - Post-resuscitation care to include targeted temperature management, if indicated.
- **Acute Decompensation (Including Post-Cath Lab and Post-Thrombectomy):**
    - Notify cardiology or neurology consultant immediately.

- Administer emergency medications (e.g., nitroglycerin, furosemide, vasopressors, or antiplatelets) as per protocol.
- For cath lab patients, assess for vascular complications (e.g., hematoma, retroperitoneal bleed) and initiate appropriate interventions.
- For post-thrombectomy patients, assess for neurological deterioration (e.g., reduced consciousness, new deficits) and order urgent CT brain if indicated.
- Prepare for potential ICU transfer.

10. Family Communication

- Daily updates to be provided to the patient's family by the cardiology or neurology team or HDU nurse.
- Explain the patient's condition, including reasons for transfer from the ward, cath lab, or post-thrombectomy, treatment plan, and expected duration of HDU stay (e.g., 24–72 hours for stroke patients).
- Provide contact information for the HDU charge nurse for non-urgent inquiries.

11. Discharge Planning

- Begin discharge planning within 24 hours of HDU admission.
- Coordinate with social services for home care or rehabilitation needs, especially for post-cath lab and post-thrombectomy patients.
- Provide patients with a written summary of their HDU stay, medications, and follow-up appointments, including cath lab or thrombectomy procedure details if applicable.

Departmental SOPs (Teaching/ Training)

Introduction to Teaching & Training SOPs

The Division of Cardiology, MTI-HMC, functions as a recognized teaching and training department for undergraduate, postgraduate, and fellowship programs. These SOPs define the structure, governance, supervision, and assessment of all educational activities to ensure safe, ethical, structured, and outcome-based training, without compromising patient care.

1. Scope of Teaching & Training

1.1 Target Learners

- MBBS undergraduate students
- House Officers
- Postgraduate residents (FCPS / CPSP / equivalent)
- Fellowship trainees (Interventional Cardiology, Electrophysiology, Stroke Intervention)
- Nursing and allied health staff

1.2 Training Sites

- Chest Pain Unit (CPU)
- Cardiology Ward & CCU
- High Dependency Unit (HDU)
- Cardiac Rehabilitation Center (CRC)
- Cardiac Catheterization Lab
- Electrophysiology Lab
- Paeds Cardiology

2. Governance & Oversight of Training

2.1 Academic Leadership

- Head, Division of Cardiology: Overall academic responsibility
- Program Supervisors: Day-to-day supervision of trainees

- Unit In-Charges: Ensure safe integration of trainees into clinical care

2.2 Regulatory Compliance

- Training aligned with **CPSP**, **KGMC**, and institutional policies
- Annual review of training structure and outcomes

---

3. Teaching & Training Modalities

3.1 Clinical Training

- Supervised bedside teaching
- Case-based discussions
- Ward rounds with consultant oversight
- Emergency case exposure under direct supervision

3.2 Procedural Training

- Graduated responsibility model:
  - Observation → Assistance → Supervised performance
- No independent procedures without consultant authorization
- Mandatory documentation of all procedures in logbooks

3.3 Academic Teaching

- Journal clubs
- ECG / Echo / Imaging sessions
- Mortality & Morbidity meetings
- Multidisciplinary team (MDT) meetings

---

4. Training in Specific Units

4.1 Chest Pain Unit (CPU)

- ACS assessment and triage training
- ECG interpretation
- Initial ACS management
- Safe referral to CCU / Cath Lab

4.2 Cardiology Ward & CCU

- Inpatient cardiac management

- Hemodynamic monitoring
- Post-PCI and heart failure care
- ACLS exposure

4.3 High Dependency Unit (HDU)

- Advanced monitoring
- NIV management
- Post-interventional and post-stroke care
- Emergency escalation protocols

---

5. Teaching & Training in CRC

5.1 Role of CRC

CRC serves as a **central academic and procedural training hub** for cardiology trainees.

5.2 CRC Training Components

- **First Floor (General Cardiology):**
  - Step-down care
  - Medication optimization
  - Discharge planning
- **Second Floor (Electrophysiology Unit):**
  - Device implantation exposure
  - Telemetry interpretation
  - Device follow-up and interrogation
- **Third Floor (Cath Labs):**
  - Diagnostic angiography
  - PCI (elective and emergency)
  - EP studies and device implantation

5.3 Supervision

- All CRC training conducted under **direct consultant supervision**
- Patient consent mandatory for trainee participation

---

6. Fellowship Training Programs

6.1 Interventional Cardiology Fellowship

- Structured two-year program
- Defined procedural numbers
- Research and audit participation

6.2 Electrophysiology Training

- Device implantation and follow-up
- EP studies exposure
- Rhythm interpretation competency

---

7. Assessment & Evaluation

7.1 Workplace-Based Assessments

- Mini-CEX
- DOPS
- TOACS / Case-based discussions

7.2 Logbooks

- Mandatory maintenance and periodic verification
- Reviewed by supervisors and Head of Department

7.3 Performance Review

- Regular academic review meetings
- Identification of deficiencies and remedial plans

---

8. Ethical & Patient Safety Considerations

- Patient safety takes precedence over training
- No trainee involvement without supervision
- Informed consent required for trainee participation
- Confidentiality and professionalism mandatory

---

9. Documentation & Records (Teaching)

- Attendance sheets
- Academic schedules
- Logbooks and assessment forms

- Training certificates and supervisor reports

---

10. Quality Assurance in Teaching & Training

- Periodic review of training outcomes
- Feedback from trainees and faculty
- Alignment with CPSP and KGMC standards
- Continuous improvement through audits and evaluations

Departmental Time tables

The Department of Cardiology maintains structured and approved departmental timetables to ensure effective delivery of clinical services, academic activities, and

research commitments. These timetables clearly define faculty duties, trainee rotations, academic sessions, OPD coverage, catheterization laboratory schedules, emergency coverage, and on-call responsibilities. Timetables are reviewed periodically and updated as per departmental and institutional requirements.

Academics (UG and PG):

The department is actively involved in undergraduate and postgraduate teaching in accordance with university and regulatory body guidelines. Academic engagements include lectures, bedside teaching, ward rounds, case-based discussions, journal clubs, imaging sessions, ECG discussions, MDTs, seminars, and assessments. Teaching responsibilities are allocated among faculty members based on expertise and subspecialty, ensuring comprehensive coverage of the curriculum. Academic rosters and monthly schedules are maintained as evidence of ongoing teaching activities.

The **attached PGRs academic schedule for January 2026** is presented as a **representative example** of the department's regular monthly academic activities, which are conducted consistently throughout the academic year in accordance with departmental and postgraduate training requirements.

Day	SESSION	TO BE PRESENTED BY
2nd Jan, Friday	Heart Team	Dr. Musa Kakakhel
5th Jan, Monday	ECG Club (10 ECG)	Dr. Yumna Ali | Dr. Zahoor Ahmad Khan
6th Jan, Tuesday	Aortic Dissection	Dr. Fawad Khan
7th Jan, Wednesday	Imaging Club	Dr. Syed Kashif Ur Rahman
8th Jan, Thursday	Short Case	Dr. Atta Ur Rahman | Dr. Yasir Hayat
9th Jan, Friday	Heart Team	Dr. Amjad Khan
12th Jan, Monday	Journal Club	Dr. Bilal
13th Jan, Tuesday	Coarctation of Aorta	Dr. Maryam
14th Jan, Wednesday	ECHO – Hands on	Peads Cardiology
15th Jan, Thursday	Long Case	Dr. Abbas Khan | Niaz Khan
16th Jan, Friday	Heart Team	Dr. Shabana
19th Jan, Monday	ECG Club	Dr. Shehryar Khan | Dr. Hameedullah
20th Jan, Tuesday	ACS - Guidelines 2025	Dr. Yumna Ali
21st Jan, Wednesday	Cath Basics	Dr. Samiullah

22nd Jan, Thursday	Short Case	Dr. Mujahid | Dr. Nasir Ali
23rd Jan, Friday	Heart Team	Dr. Parivash
26th Jan, Monday	Journal Club	Dr. Najeeb
27th Jan, Tuesday	Hypertension	Dr. Zubair
28th Jan, Wednesday	Imaging Club	Dr. Syed Kashif Ur Rahman
29th Jan, Thursday	TBL – Imaging Cases	Dr. Farmanullah (SPR)
30th Jan, Friday	Heart Team	Dr. Aamir Jr

Interventional Cardiology Fellows Schedule:
Morning Class (8:00 AM to 9:00 AM)

Day	Daily audit of PPCI (10 minutes)	Activity	Location
Monday	PPCI audit	Topic discussion	Heart Linq
Tuesday	-	CPC	PGMI
Wednesday	PPCI audit	Imaging Session	Heart Linq
Thursday	-	Online Imaging Class	Heart Linq
Friday	PPCI audit	Heart Team	Heart Linq

Postgraduate Academic Activity Schedule:

Day	Activity	Assignment	Venue	Presenter	Co-Presenter	Reflection
1	Welcome, Orientation & Motivation Speech	History Taking	Heart Linq	Dr. Niaz Khan	Dr. Irfan	Yes
2	History Taking	Two Histories – IHD	Heart Linq	Dr. Samiullah	Dr. AB Waris	Yes
3	GPE	One History – Heart Failure + Examination	Heart Linq	Dr. Yasir Hayat	Dr. Farman	Yes
4	GPE	One History – MVD + Examination	CRC	Dr. Nasir Ali	Dr. Noor Faraz	Yes
5	Examination of Precordium	One History – AVD + Examination	CRC / Echo Room	Dr. Zahoor	Dr. Irum	Yes

	(Inspection +Palpation)					
6	Examination of Precordium (Normal Auscultation)	One History – AVD + Examination	CRC	Dr. Shah Sawar	Dr. Irfan	Yes
7	Examination of Precordium(Murmurs)	One History- Arrhythmia+Examination	CRC	Dr. Hameedullah	Dr. Abdul Waris	Yes
8	Examination of Precordium(Summary)	One History + Examination	CRC	Dr. Niaz Khan	Dr. Farman	Yes
9	Examination of Precordium(Summary)	-	CRC	Dr. Samiullah	Dr. Noor Faraz	Yes
10	Assessment and Feedback	-	Heart Linq	Dr. Yasir Hayat	Dr. Irum	Yes

Research (Research Map – Top 5 Areas)

The Department of Cardiology follows a focused research strategy aligned with national disease burden and institutional priorities. The major research areas include:

1. Ischemic heart disease and interventional cardiology
2. Heart failure and cardiomyopathies
3. Cardiac electrophysiology and arrhythmias
4. Preventive cardiology and cardiovascular risk factors
5. Structural and congenital heart diseases

Faculty members and postgraduate trainees are encouraged to participate in clinical research, audits, and publications under departmental supervision.

Services (including pt care e.g OT, OPD and Emerg):

The department provides comprehensive cardiology services including outpatient care (OPD), inpatient management, emergency cardiology services, and operative/interventional procedures. Services are delivered through organized OPD clinics, ward services, catheterization laboratories, and 24/7 emergency coverage. Patient care is provided in accordance with evidence-based guidelines, with emphasis on patient safety, quality of care, and continuity of services.

Clinical audit of individual consultants (at least annually)

A structured clinical audit is conducted for each consultant at least once annually. These audits assess clinical performance, patient outcomes, adherence to guidelines, and quality indicators. Audit findings are reviewed at departmental meetings and used for quality improvement, professional development, and enhancement of patient care standards.

Record (in the form of certificate issued by DME) of MCQs submitted by each faculty in the current post

Not Available

Innovative and New Teaching Methodologies (evidence/record)

(Competency-Based and Team-Oriented Education Framework)

The Department of Cardiology has adopted **modern, evidence-based educational strategies** to ensure structured competency development, team effectiveness, and patient safety, in alignment with CPSP and international postgraduate training standards.

Key teaching and assessment innovations include:

- **Mini-CEX (Mini Clinical Evaluation Exercise):**
  Direct observation of resident–patient encounters to assess history taking, physical examination, clinical reasoning, and communication skills. Performance is evaluated using entrustable professional activities with structured feedback.
  Frequency: Minimum one assessment per resident per quarter.

- **DOPS (Direct Observation of Procedural Skills):**
  Assessment of technical and procedural competence during real-time procedures including Cath lab interventions and device implantation. Structured evaluation of procedural steps, decision-making, and post-procedure management with immediate feedback.
  Frequency: Minimum one procedure per resident per quarter.

- **TOACS / Case-Based Discussion:**
  Evaluation of understanding of core cardiology concepts and management of complex cases through facilitated discussion. Clinical reasoning and decision-making are graded using standardized rating scales.
  Frequency: Monthly for residents and quarterly for fellows.

- **Team-Based Learning (TBL):**
  Structured small-group learning sessions designed to enhance clinical reasoning, communication, and collaborative decision-making. Trainees work in multidisciplinary teams to analyze real-world clinical scenarios, apply guidelines, and justify management strategies. This approach reinforces teamwork skills essential for CCU and cath lab environments.
  Frequency: Incorporated into scheduled academic sessions and specialty modules.

- **Mock Examinations:**
  High-fidelity examination simulations replicating FCPS formats to prepare trainees for high-stakes assessments. Results are analyzed to identify learning gaps and guide targeted feedback.
  Frequency: Half-yearly.

- **Summative Assessment:**
  Final competency evaluation for certification conducted by external examiners as per prescribed regulatory protocols and timelines.

Publications of each faculty member

Dr. Shah Sawar Khan			
Sr	**Title**	**Journal, Issue, Volume No and Publication Date**	**Article URL or DOI**
1	Intracoronary Tirofiban vs Adenosine in No-Reflow Post-PCI: Effectiveness & Outcomes in TIMI Flow – A Systematic Review	*Cardiology Research* 2023	https://doi.org/10.14740/cr1512
2	Comparison of the Effectiveness of Radial versus Femoral Access for Diagnostic and Therapeutic Procedures in Patients with Peripheral Arterial Disease	*Biomedical & Clinical Sciences Research Journal* April 2023	https://doi.org/10.54393/bcsrj.v2i2.114
3	Frequency of Idiopathic Left Ventricular Tachycardia in Patients with Narrow Complex Tachycardia at a Tertiary Care Hospital: A Cross-Sectional Study	*Heart International* 2024	https://doi.org/10.53350/pjmh2023172853
4	Age of Tachycardia Onset and Clinical Outcomes in AVNRT vs Accessory Pathway-Mediated Tachycardia	*Heart International* December 2024	https://doi.org/10.4174/hj.v81.2860
5	Identification of Risk Factors Influencing In-Stent Restenosis (ISR) in Post-PCI Patients	*Pakistan Journal of Cardiovascular Intervention* July 2024	https://doi.org/10.5889/PJCI.17.621
6	Long-Term Outcomes of Patients Undergoing Percutaneous Coronary Intervention (PCI) for Chronic Total Occlusions	*Pakistan Journal of Medical & Health Sciences* February 2023	https://doi.org/10.53350/pjmhs2023172859
7	Comparison of Drug-Eluting Stents versus Bare Metal Stents for the Treatment of Coronary Artery Disease	*Biological & Clinical Sciences Research Journal* April 2023	https://doi.org/10.54393/bcsrj.v2i2.215
8	Frequency of Dry Cough as an Adverse Effect in Patients Started on ACE Inhibitors Presenting with ACS and Heart Failure	*Indus Journal of Biosciences Research* 2024	https://doi.org/10.70749/ijbr.v2i02.207
9	Incidence of Contrast-Induced Nephropathy with CTO-PCI in Diabetic Patients	*Pakistan Journal of Cardiovascular Intervention* April 2024	https://pjci.pk/article/view/38
10	Impact of Fractional Flow Reserve (FFR)-Guided PCI on Clinical Outcomes in Multivessel Coronary Artery Disease	*Pakistan Journal of Medical & Health Sciences* February 2023	https://doi.org/10.53350/pjmhs2023172853
11	Intracoronary Tirofiban vs adenosine in no-reflow post PCI: effectiveness & outcomes in TIMI flow (systematic review)	PJCVI, 3(2):41–45, 2023	https://doi.org/10.58889/PJCVI.5.41.45

13	Prevalence of hypertension and other associated factors among individuals aged ≥15 years in Federally Administered Tribal Areas of Pakistan	KMUJ, Vol 14(2), 2022	https://doi.org/10.35845/kmuj.2022.21711
14	Relationship between belly fat and cardiovascular disease: a survey-based multi-center study in cardiology	PJMHS, Vol 16(10), Oct 2022 (page 918 mentioned)	https://pjmhsonline.com/index.php/pjmhs/citationstylelanguage/get/acs-nano?submissionId=3310&publicationId=3310
15	Frequency of idiopathic left ventricular tachycardia in patients with narrow complex tachycardia at a tertiary care hospital: a cross-sectional study	Pakistan Heart Journal, 58(01):86–91, 2025	doi.org
16	Age of tachycardia onset and clinical outcomes in AVNRT vs accessory pathway-mediated tachycardia	Pakistan Heart Journal, 58(01):92–98, 2025	https://doi.org/10.47144/phj.v58i1.2860
18	Frequency of ventricular septal rupture as a complication of acute ST-elevation myocardial infarction in patients presenting to a tertiary care hospital	JAMCA, Vol 34, No 4 (Suppl 1), 2022	https://doi.org/10.55519/JAMC-04-S4-10258
19	Frequency of depression in chronic heart failure	Journal of Ayub Medical College (Year/Vol/Issue not stated in CV)	https://jamc.ayubmed.edu.pk/index.php/jamc/article/view/2183
23	Frequency of pacemaker complications	JPMI – Lady Reading Hospital (Year/Vol/Issue not stated in CV)	https://www.jpmi.org.pk/index.php/jpmi/article/view/1265
25	Complications associated with trans-esophageal echo in tertiary care hospital	Pakistan Heart Journal (Year/Vol/Issue not stated in CV)	https://pakheartjournal.com/index.php/pk/issue/download/156/2
26	Pattern of coronary artery disease with no risk factors under age 35 years	J Ayub Med Coll Abbottabad (Year/Vol/Issue not stated in CV)	https://pubmed.ncbi.nlm.nih.gov/22455276/
27	Myocardial infarction in young versus older adults: clinical characteristics and angiographic features	J Ayub Med Coll Abbottabad (Year/Vol/Issue not stated in CV)	https://pubmed.ncbi.nlm.nih.gov/21702300/
28	Frequency and predictors of renal artery stenosis in patients with coronary artery disease	J Ayub Med Coll Abbottabad (Year/Vol/Issue not stated in CV)	https://www.ayubmed.edu.pk/JAMC/PAST/22-1/Sadiq.pdf
29	Evaluation of mitral stenosis patients with atrial fibrillation for factors associated with left atrial thrombus	KJMS, Jul–Dec 2013	https://kjms.com.pk/old/sites/default/files/85-259-1-PB.pdf
30	Complications of streptokinase in patients with acute ST-elevation MI	JPMI, Vol 33, No 4 (Year not stated in CV)	http://jpmi.org.pk/index.php/jpmi/article/view/2494/2329

31	Diagnostic accuracy of CT angio for detection of stenosis in distal segments of main coronary arteries	Pakistan Heart Journal, Vol 45, 2012	ww.pkheartjournal.com/index.php/journal/article/view/47
32	In-patient burden of heart failure in cardiology units of tertiary care hospitals in Peshawar	Pak J Physiol, 2012	https://doi.org/10.69656/pjp.v8i1.721
33	In-patient burden of heart failure in cardiology units of tertiary care hospitals in Peshawar	KJMS, May–Aug 2019	https://doi.org/10.69656/pjp.v8i1.721
34	Frequency of hyperuricemia in patients with heart disease	KJMS, May–Aug 2019	https://kjms.com.pk/old/sites/default/files/KJMS-32_5.pdf

Prof Mahmood Ul Hassan			
Sr	**Title**	**Journal, Issue, Volume No and Publication Date**	**Article URL or DOI**
1	Frequency of left main CAD in patients presenting for angiography	Annals Pakistan Institute of Medical Sciences, 13(1) – 2017	https://apims.net/apims_old/Volumes/Vol13-1/FREQUENCY%20OF%20LEFT%20MAIN%20CORONARY%20%20ARTERY%20DISEASE%20IN%20PATIENT%20PRESENTING%20FOR%20CORONARY%20ANGIOGRAPHY.pdf
2	Effectiveness of enoxaparin in elective PCI for stable CAD	Journal of Postgraduate Medical Institute, Vol.32(1) – 2018	https://jpmi.org.pk/index.php/jpmi/article/view/2367
3	Percutaneous balloon valvotomy in mitral stenosis	Journal of Postgraduate Medical Institute, Vol.32(1) – 2018	https://jpmi.org.pk/index.php/jpmi/article/view/2280/0?articlesBySameAuthorPage=1
4	Average time of presentation to emergency & streptokinase use	Pakistan Heart Journal, Vol.51(3) – 2018	https://pakheartjournal.com/index.php/pk/article/view/1536
5	Frequency of traditional risk factors & lipid profile in ACS	Pakistan Heart Journal, Vol.52(1) – 2019	https://www.pakheartjournal.com/index.php/pk/citationstylelanguage/get/ieee?submissionId=1687&publicationId=1489
6	Peripartum cardiomyopathy – A hospital study	Pakistan Heart Journal, Vol.52(3) – 2019	https://pakheartjournal1.pcs.org.pk/index.php/pk/article/view/1781/924
7	Wrist or groin complications in coronary angiography	IAJPS, Vol.8(12) – 2021	Not available
8	Pulmonary embolism: clinical parameters vs CTPA	*Journal index unclear*, Vol.18(9) – 2022	Not available
9	Prevalence of hypertension & risk factors in FATA	KMUJ, Vol.14(2) – 2022	https://kmuj.kmu.edu.pk/article/view/79

Dr. Muhammad Asghar Khan – Associate Professor			
Sr.	**Title**	**Journal, Issue, Volume No and Publication Date**	**Article URL or DOI**
1	Association between Aldosterone Synthase (*CYP11B2*) Gene Polymorphism and Hypertension in Pashtun Ethnic Population of Khyber Pakhtunkwha, Pakistan.	*Genes* 2023, *14*, 1184. 29/5/2023	https://doi.org/10.3390/genes14061184
2	Frequency of Anxiety and Psychosocial Stressful Events in Patients with Acute Myocardial Infraction.	JAMC April-June 2010, Vol 22, No2 Pages 32—35. April-June 2010. 1/6/2010	https://www.jamc.ayubmed.edu.pk/index.php/jamc/article/view/2938
3	Anaemia in Heart Failure Patients: is it Looked for and Treated?	Indus Journal of Bioscience Research; Jan 2025,3(1), 856—861.	https://doi.org/10.70749/ijbr.v3i1.558
4	Frequency of Ventricular Tachycardia in First 48 Hours of ST-Elevation Myocardial Infarction: Ventricular Tachycardia in Myocardial Infarction.	Pakistan Journal of Health Sciences 2023, 4(02)	https://doi.org/10.54393/pjhs.v4i02.551
5	In-Hospital Outcomes of Patients with Anterior Wall Myocardial Infarction and Right Bundle Branch Block in the Primary PCI Era: Impact and Prognostic Factors.	Pak Heart J 2024; 57(2): 130—5.	https://pakheartjournal.com/index.php/pk/article/view/2762
6	Incidence of Atrial fibrillation in patient with Permanent Pacemaker.	J Saidu Med Coll 2025; 15(1): 3—9. Jan 2025	https://jsmc.pk/index.php/jsmc/article/view/1060
7	Facts and factors about permanent pacemakers lead displacement.	J Postgrad Med Inst. 2025;39(1):1-9. 2025	http://doi.org/10.54079/jpmi.39.1.3543
8	Incidence of Atrial fibrillation in patient with Permanent pacemaker.	J Saidu Med Coll 2025 Jan. 29 [cited 2025 Oct. 28];15(1):3-9.	https://doi.org/10.52206/jsmc.2025.15.1.1060
9	Frequency of Hypercholesteremia in Patients presenting with acute coronary syndrome.	Global Pharmaceutical SciencesReview, VIII9I), 71-77. 2023	https://doi.org/10.31703/gpsr.2023(VIII-I).10
10	Women at increased risk for heart failure and mortality after myocardial infraction	Global Pharmaceutical SciencesReview, VIII9I), 45-49. 2023	https://doi.org/10.31703/gpsr.2023(VIII-II).09
10	Intracoronary vs IV bolus Tirofiban in STEMI PCI	Pakistan Journal of Health Sciences, Vol.3(7) – 2022	https://doi.org/10.54393/pjhs.v3i07.438
11	Cytochrome P450 2C19*2 Genetic polymorphism in ACS	Preventive Medicine & Community Health, 2(02) – 2022	Not available

Dr. Hameedullah – Associate Professor

Sr.	Title	Journal, Issue, Volume No and Publication Date	Article URL or DOI
1	Frequency of Atypical AVNRT in Patients Presenting with Narrow Complex Tachycardia	JIMDC 2024	https://doi.org/10.35787/jimdc.v13i2.1135
2	Frequency and Clinical Implications of Atrial Fibrillation in Patients with Accessory Pathways	JIMDC 2024	https://jimdc.org.pk/index.php/JIMDC/article/view/1120/899
3	Incidence of Pocket Infection after Implantation of Permanent Pacemaker	JIMDC 2024	https://jimdc.org.pk/index.php/JIMDC/article/view/1118/900
4	Frequency of Idiopathic Left Ventricular Tachycardia in Patients with Narrow Complex Tachycardia	Pakistan Heart Journal 2024	https://doi.org/10.47144/phj.v58i1.2813
5	Age of Tachycardia Onset and Clinical Outcomes in AVNRT vs. Accessory Pathway-Mediated Tachycardia	Pakistan Heart Journal 2024	https://doi.org/10.47144/phj.v58i1.2860
6	Effect of Cardiac Resynchronization Therapy (CRT) on Six-Minute Walk in Patients with Heart Failure and Left Bundle Branch Block	JPMI 2024	https://doi.org/10.54079/jpmi.38.4.3367
7	Impact of Chronic Kidney Disease on Outcomes of Primary PCI	International Journal of Biomedicine and Research 2024	https://doi.org/10.70749/ijbr.v2i02.159
8	Impact of Chronic PVC Burden on Left Ventricular Function and Cardiovascular Outcomes	JIBR 2025	https://doi.org/10.70749/ijbr.v3i1.430
9	Primary PCI for STEMI in Patients with Chronic Total Occlusions	IJBR 2025	https://doi.org/10.70749/ijbr.v3i1.414
10	Frequency of Disabling Symptoms in Supraventricular Tachycardia	IJBR 2024	https://doi.org/10.70749/ijbr.v2i02.413
11	Primary PCI in Elderly STEMI Patients: Risk Assessment and Management	IJBR 2024	https://doi.org/10.70749/ijbr.v2i02.415
12	Incidence of Atrial Fibrillation in Patients with Permanent Pacemaker	JSMC 2024	https://doi.org/10.52206/jsmc.2025.15.1.1060
13	Effect of Cardiac Resynchronization Therapy on Left Ventricular Function in Patients with Heart Failure and Left Bundle Branch Block	JSMC 2025	https://doi.org/10.52206/jsmc
14	Heart Failure Improvement by Switching from RV to LV Pacing in Pacemaker Induced Cardiomyopathy	PHJ 2025	https://doi.org/10.47144/phj
15	Effect if continuous enhanced vagal tone on dual Atrioventricular node and accessory pathway	JAMC 2025	-

Dr. Ziaullah – Associate Professor			
Sr.	**Title**	**Journal, Issue, Volume No and Publication Date**	**Article URL or DOI**
1	Cardiovascular magnetic resonance assessment of right ventricular function and pulmonary regurgitation in patients with repaired tetralogy of Fallot: A single-center experience from Pakistan	*International Journal of Pathology*, Vol. 23, No. 4, Oct–Dec 2025; Published: 31-12-2025	Not available

2	The outcome of trans-catheter closure of patent ductus arteriosus: A single-center experience	*Cureus*, 2022; Published: 24-12-2022	https://doi.org/10.7759/cureus.21577
3	Evaluation of partial anomalous pulmonary venous connection by computed tomography angiography: A retrospective cross-sectional study at a tertiary care hospital	*Khyber Journal of Medical Sciences*, Vol. 12, No. 3, 2019	Not available
4	Frequency of coronary anomalies among patients with tetralogy of Fallot	*Khyber Journal of Medical Sciences*, Vol. 11, No. 3, 2018	Not available
5	Morphologic characteristics of eighty-four patients with total anomalous pulmonary venous connection	*Khyber Journal of Medical Sciences*, Vol. 10, No. 2, 2017	Not available
6	Brain abscess in children with cyanotic congenital heart disease: Clinical presentation and outcome	*Journal of Saidu Medical College*, Vol. 7, No. 2, 2017	Not available
7	Comparison of efficacy of amoxicillin versus ceftriaxone in children with pneumonia	*Journal of Saidu Medical College*, Vol. 7, No. 2, 2017	Not available

Dr. Zahoor Ahmad Khan – Associate Professor			
Sr.	Title	Journal, Issue, Volume No and Publication Date	Article URL or DOI
1	Hypomagnesimia causing ventricular tachycardia in patients presenting to CCU	J Med Sci Vol 31 No. 02, 2023	https://doi.org/10.52764/jms.23.31.2.5
2	Success rate in patients with Atrioventricular nodal rentrant tachycardia (AVNRT) slow pathway catheter ablation with and without junctional rhythm	PJMHS Vol 16 No. 11, 2022	https://doi.org/10.53350/pjmhs20221611626
3	Frequency Of Atrial Fibrillation In Patients With Implantation Of Ventricular Demand Rate Responsive And Dual Chamber Rate-Modulated Pacemaker	JPMI Vol 38 No.01 , 2024	https://doi.org/10.54079/jpmi.38.1.3201
4	Radiofrequency catheter ablation of Mahaim tachycardia in adult patients	PJHS Vol 4 No.04, 2023	DOI: 10.54393/pjhs.v4i04.690
5	Comparison of intracardiac echo (ICE) guided versus non intracardiac echo radiofrequency catheter ablation of Cavotricuspic Isthmus dependant atrial flutter	PJHS Vol 4 No.04 2023	https://doi.org/10.54393/pjhs.v4i04.701
6	Frequency of hypomagnesimea in patients presenting with acute coronary syndrome	J Med Sci No.01, 2023	https://doi.org/10.52764/jms.23.32.1.10
7	Frequency of ventricular tachycardia in first 48hrs of ST elevation Myocardial infarction	PJHS Vol 4 No.02, 2023	DOI: 10.54393/pjhs.v4i02.551
8	Frequency of left ventricular mechanical dyssynchrony in chronic heart failure	PJMHS Vol 17, NO. 01, 2023	https://doi.org/10.53350/pjmhs2023171628
9	Frequency of contrast induced nephropathy in diabetic patients undergoing coronary angioplasty	PJMHS Vol 16 No. 12, 2022	https://doi.org/10.53350/pjmhs20221612795

10	Ventricular tachycardia in patients with arrythmogenic right ventricular cardiomyopathy	JPTCP Vol 28 No.02 2021	https://doi.org/10.53555/jptcp.v28i2.3870
11	Frequency of long QT syndrome in patients presenting to tertiary care hospital	JPTCP Vol 29 No.04 2022	https://doi.org/10.53555/jptcp.v29i04.3859
12	Radiofrequency catheter ablation of idiopathic left posterior fasicular ventricular tachycardia in sinus rhythm	JPTCP Vol 29 No.03 2022	https://doi.org/10.53555/jptcp.v29i03.3860
13	Frequency of bundle branch block in patients with reduced ejection fraction heart failure	JPTCP Vol 28 No.02 2021	https://doi.org/10.53555/jptcp.v28i2.4209

Dr. Nasir Ali – Assistant Professor			
Sr.	Title	Journal, Issue, Volume No and Publication Date	Article URL or DOI
1	Malignant Multi-Vessel Coronary Artery Spasm; A Rare Cause of Myocardial Infarction Leading to Cardiogenic Shock – A Case Report	Pakistan Heart Journal Volume 55, Issue 1, March 25, 2022	10.47144/phj.v55i1.2136
2	Comparison of Intracoronary Verapamil and Adenosine for No-Reflow in Normotensive Patients with Acute Coronary Syndrome: A Prospective Observational Study	Pakistan Heart Journal Volume 57, Issue 4, December 2024	10.47144/phj.v57i4.2787
3	Incidence, Predisposing Factors, and Outcomes of Periprocedural Myocardial Infarction in Elective Patients Undergoing Coronary Intervention	Pakistan Heart Journal Volume 57, Issue 2, June 18, 2024	10.47144/phj.v57i2.2741
4	Association of Hemoglobin Level with In-Hospital Outcomes in Patients with STEMI Treated with Primary Percutaneous Coronary Intervention	Pakistan Heart Journal Volume 58, Issue 2, June 30, 2025	10.47144/phj.v58i2.2786
5	In-Hospital Outcomes of Patients with Anterior Wall Myocardial Infarction and Right Bundle Branch Block in the Primary PCI Era: Impact and Prognostic Factors	Pakistan Heart Journal Volume 57, Issue 2, June 18, 2024	10.47144/phj.v57i2.2762
6	Heart Failure Improvement by Switching from RV to LV Pacing in Pacemaker-Induced Cardiomyopathy	Pakistan Heart Journal Volume 58, Issue 2, June 2025	10.47144/phj.v58i2.2840
7	Frequency of Idiopathic Left Ventricular Tachycardia in Patients with Narrow Complex Tachycardia at a Tertiary Care Hospital: A Cross-Sectional Study	Pakistan Heart Journal Volume 58, Issue 1 March 30, 2025	10.47144/phj.v58i1.2813
8	Frequency of Disabling Symptoms in Supraventricular Tachycardia	Indus Journal of Bioscience Research, Volume 2, Issue 02, 2024	10.70749/ijbr.v2i02.413
9	Frequency and Clinical Implications of Atrial Fibrillation in Patients with Accessory Pathways	J Islamabad Med Dental Coll, Volume 13, Issue 1, 2024	10.35787/jimdc.v13i1.1120
10	Frequency of Atypical AVNRT in Patients Presenting with Narrow Complex Tachycardia	J Islamabad Med Dental Coll, Volume 13, Issue 2, 2024	10.35787/jimdc.v13i2.1135

11	Outcomes of Drug-Eluting Balloon-Only Percutaneous Coronary Intervention in Elderly Patients with Acute Coronary Syndrome and High Bleeding Risk	Cureus Volume 17, Issue 6, June 05, 2025	https://doi.org/10.7759/cureus.85394

Dr. Yasir Hayat – Assistant Professor			
Sr.	Title	Journal, Issue, Volume No and Publication Date	Article URL or DOI
1	**Determine three months clinical outcomes after ST elevated myocardial infarction treated with fibrinolysis among patients with less years of education**	*Pakistan Heart Journal*, 2018; 51(02): 104–108	Not provided
2	**Primary Percutaneous Coronary Intervention in Multivessel Disease: Complete versus Culprit-only Revascularization**	*Journal of Islamabad Medical & Dental College*, 2023; 12(4): 353–359	DOI: 10.35787/jimdc.v12i4.1318
3	**Outcomes of Primary Percutaneous Coronary Intervention with and without Post Dilatation in Patients with ST Segment Elevation Myocardial Infarction**	*JPUMHS (Journal of Peshawar University of Medical and Health Sciences)*, 2023; 13(01): 32–38	DOI: 10.46536/jpumhs.2023.13.01.38-4
4	**Assessment of Anticoagulation Using Activated Clotting Time (ACT) in Patients Receiving Enoxaparin and Heparin During Percutaneous Coronary Intervention (PCI)**	*JPUMHS*, 2023; 13(01): 11–17	DOI: 10.46536/jpumhs/2023/13.01.381
5	**Prevalence of Risk Factors in Patients with Heart Failure with Normal Ejection Fraction (HFNEF)**	*Pakistan Heart Journal*, 2014 (Volume not specified)	Not provided
6	**Efficacy of Streptokinase in Diabetic Patients with Acute ST Elevation Myocardial Infarction**	*Pakistan Journal of Physiology*, 2015; 15(1): 10–12	Not provided

Dr. Niaz Khan – Assistant Professor			
Sr.	Title	Journal, Issue, Volume No and Publication Date	Article URL or DOI
1	Impact of Door-to-Balloon Time on Long-Term Outcomes in Patients Undergoing Primary PCI	Journal not specified	Not available
2	Impact of Chronic PVC Burden on Left Ventricular Function	Journal not specified	Not available
3	Angiographic Severity of Coronary Artery Disease in Diabetic vs Non-Diabetic Patients	Journal not specified	Not available
4	Frequency of Low-Density Lipoprotein Abnormalities in Cardiac Patients	Journal not specified	Not available

5	Primary PCI in Diabetic Patients: Clinical Outcomes and Challenges	Journal not specified	Not available
6	Co-author Article (Manuscript ID 17623)	Journal not specified	Not available
7	Frontiers in Pharmacology Article (ID: fphar-13-900798)	*Frontiers in Pharmacology*	https://doi.org/10.3389/fphar.2022.900798
8	Primary PCI in Elderly STEMI Patients: Outcomes and Challenges	Journal not specified	Not available
9	Frequency of Stress Hypertriglyceridemia in Cardiac Patients	Journal not specified	Not available
10	Frequency of Subclinical Hypothyroidism in Cardiac Patients	Journal not specified	Not available
11	Hypertriglyceridemia in Patients Presenting with Heart Failure	Journal not specified	Not available
12	Left Ventricular Hypertrophy among Non-Diabetic Patients	Journal not specified	Not available
13	Low Platelet Count in Cardiac Patients: Clinical Profile	Journal not specified	Not available

List of Conferences, workshops, training, webinars & seminars organized/ presented/ attended in the current post

Prof Mahmood Ul Hassan

Year	Activity Type	Title / Event	Role	Organizing Body / Institution	Venue / Mode	Remarks
2023	Certification	Certificate in Health Professions Education & Research	Participant	KMU – IHPER	Peshawar	Academic qualification
2022	Conference	51st CARDIOCON	Convener	PCS	Peshawar	National conference
2021	Professional Fellowship	Fellow of American College of Cardiology (FACC)	Fellow	ACC	USA	International recognition
2018	Professional Role	FCPS Cardiology Examiner	Examiner	CPSP	Pakistan	Postgraduate assessment
2018	Membership	European Association of Percutaneous Coronary Intervention (EAPCI)	Member	ESC	Europe	Professional membership
2017	Membership	Pakistan Society of Cardiology	Life Member	PSC	Pakistan	—
2016	Academic Role	Training Program Director (Cardiology)	Director	PGMI / HMC	Peshawar	Academic leadership

Dr. Shah Sawar Khan – Associate Professor

S.No	Date	Activity Type	Topic / Description	Role	CME Credits
1.	2026-01-03 to 04	National Conference	In Prevention Lies our Salvation	Attendee	4
2.	2025-12-31	Workshop	Management of Acutely Ill Medical Patients in the Emergency Room	Attendee & Speaker	"2 + 2"
3.	2025-12-30	Workshop	Basic Life Support	Attendee & Speaker	"1.67 + 2"
4.	2025-10-17 to 19	International Conference	From Hormones to Health: Inspiring Hope Through Science (Karachi)	Attendee	6
5.	2025-10-16	Accredited Activity	Participation of Multidisciplinary Specialties to Optimize Oncologic Outcomes	Attendee	2.75

6.	2025-10-02	Workshop	Rotablation Simulation	Attendee & Speaker	"1.5 + 3"
7.	2025-07-11	Workshop	Semaglutide in Cardiovascular Health	Attendee & Speaker	"1.1 + 2"
8.	2025-06-04	CME Activity	Mock Examination FCPS-II Cardiology	Examiner	3
9.	2025-05-20 to 23	International Conference	EuroPCR 2025 (Paris)	Attendee	15
10.	2025-02-13 to 14	Workshop	Artificial Intelligence in Medical Education	Attendee	4
11.	2025-02-07 to 09	International Conference	21st International Conference on Cardiac Arrhythmias (Rawalpindi)	Attendee	9
12.	2025-02-06 to 07	Workshop	Artificial Intelligence in Medical Education	Attendee	4
13.	2025-01-20	Clinical Audit	Evaluation of Antibiotic Duration of Therapy	Indications and Monitoring	Clinical Audit Lead
14.	2024-12-18 to 19	International Conference	GulfPCR-GIM	Attendee	Not specified
15.	2024-10-31	Symposium	Prevention (Pakistan Cardiac Society)	Chief Organizer	Not specified
16.	2024-10-22	Online Course	Critical Care Course (Aga Khan University)	Completed	9
17.	2024-05-31	CME Activity	Mock Examination FCPS-II Cardiology	Examiner	3
18.	2024-05-29	Workshop	Quick Review of Cardiology	Attendee & Speaker	"2 + 1"
19.	2023-11-11	CME Activity	Mock Examination FCPS-II Cardiology	Examiner	3
20.	2023-11-04	CME Activity	Mock Examination FCPS-II Cardiology	Examiner	3
21.	2023-10-25	Workshop	Life does not end with Menopause	Attendee & Speaker	"1 + 1"
22.	2023-10-11	Conference	Quick Review of Cardiology Diagnosis and Interventions	Attendee & Facilitator	"2 + 1"
23.	Not dated	Accredited Course	Saudi Commission for Health Specialties - Scientific Content Review Committee (SCRC)	Attendee	7

Sr.#	Year	Activity Type	Title / Event	Role	Organizer / Institution	CME / CPD
1	2019	Conference	Pakistan Live 2019	Delegate	PSIC / UHS Lahore	18 CME
2	2019	Conference	49th Cardiocon, Islamabad	Attendee	Pakistan Cardiac Society	CPD 18
3	2019	CME Seminar	Hypertension – A Silent Killer	Guest Speaker	PIMA KPK	1 CME
4	2019	CME Seminar	Hypertension – A Silent Killer	Participant	PIMA KPK	2 CME
5	2019	Course	IVUS Image Interpretation Course	Participant	Rawalpindi Institute of Cardiology	—
6	2020	Academic Lecture	Management of Heart Failure (Online)	Speaker	PharmEvo	—
7	2020	Academic Session	Management of Heart Failure	Speaker	eDR / Sacvin	—
8	2021	Workshop	ROTA Workshop (Interventional Cardiology)	Co-Convener	KGMC / HMC	—
9	2021	Workshop	3rd Mechanical Thrombectomy Workshop	Participant	Heart LinQ CRC, HMC	6 CME
10	2021	Conference	EURO PCR 2021	Participant	EAPCI / ESC	—
11	2022	Conference	Pakistan Live Interventional Meeting	Delegate	PSIC	—
12	2022	Conference	51st Cardiocon, Peshawar	Delegate	Pakistan Cardiac Society	6 CME
13	2022	Pre-Conference Workshop	SHEHLA – Interventions for PGs	Organizer / Facilitator	PCS / KTH	CME
14	2022	Course	Quick Cardiology Review Course (3rd / 8th)	Organizer / Facilitator	KMC / KTH	PGMI CME
15	2022	Congress	8th MENA Stroke Congress	Participant	MENASO	CME
16	2022	Grand Round	MENASO Cerebrovascular Grand Round	Attendee	MENASO	2 CME
17	2022	Webinar	CHIP-APSC-EBAC Webinar	Participant	APSC / EBAC	CME
18	2022	Webinar	APSC Educational Webinar	Participant	APSC	CME
19	2022	Conference	EXMINT (Oct–Nov 2022)	Participant	EXMINT	CME
20	2023	Conference	Pakistan Live 2023 (PAK Live)	Participant	PSIC	6 CME
21	2023	Examination	European Diploma in Ischemic Stroke Intervention (EDSI)	Candidate	ESO / ESMINT	—
22	2024	Course	Quick Cardiology Review Course	Organizer / Facilitator	KMC / KTH	PGMI CME

Dr. Hameedullah – Associate Professor

Sr#	Year	Event / Activity	Role	Venue / Location	Organizer / Body	Remarks
1	2024	Health Research (CHR) Course	Participant	KMU – IHPER	Peshawar, Pakistan	12 Credit Hours
2	2024	ECG Mastery Workshop	Organizer	Boston Scientific / Ferrosons	Peshawar	Academic leadership
3	2021	Cath Conference KP	Organizer	PSIC KP	Peshawar	National
4	2020	Outbreak Investigation Workshop	Participant	KMU	Peshawar	CME
6	2020	World Thrombosis Day Symposium	Organizer	Peshawar	PharmEvo	Academic leadership
7	2020	SCF Islamabad	Speaker	Islamabad	Scilife	National faculty
8	2021	SCF Malaysia (Virtual)	Speaker	Online	Scilife	International
9	2021	SCF CME Murree	Speaker	Murree	Scilife	CME activity
10	2022	SCF Turkey	Speaker	Turkey	Scilife	International
11	2022	CardioCon Peshawar	Delegate / Speaker	Peshawar	PCS	06 CME hours
12	2022	SCF Naran	Organizer	Naran	Scilife	Event management
13	2023	SCF Nathia Gali	Organizer	Nathia Gali	Scilife	Academic leadership
14	2024	IMC LIVE CTO CHIP Summit	Speaker / Attendee	Saudi Arabia	IMC LIVE	International CTO forum
15	2024	ECG Mastery Workshop	Organizer	Peshawar	Boston Scientific	Skills workshop
16	2024	Journal of Saidu Medical College	Reviewer	—	JSMC	Peer review
17	2025	SCF Malaysia	Speaker	Malaysia	Scilife	International faculty

Dr. Zahoor Ahmad Khan – Associate Professor

Year	Certificate / Activity	Role	Organizing Institution	Location	Date / Duration	Remarks
2023	Mock Examination FCPS-II Cardiology (CME)	Organizer / Examiner / Focal Person	PGMI – Department of Medical Education	Peshawar, Pakistan	04 Nov 2023	3 CME credit hours
2023	Pakistan Live Interventional Cardiology (PAK Live 2023)	Participant	Pakistan Society of Interventional Cardiology (PSIC)	Lahore, Pakistan	27–30 Apr 2023	6 CME hours
2022	International CME: Recent Advances in Cardiovascular Diseases	Facilitator & Attendee	Postgraduate Medical Institute (PGMI)	Peshawar, Pakistan	18–20 Nov 2022	6 CME (attendance) + 3 CME (facilitation)
2022	MENASO / Stroke-related CME Activities	Attendee	MENASO & affiliated organizations	Virtual	2022	Multiple CME certificates
2021	Certificate in Health Professions Education (CHPE)	Awardee	IHPE, Khyber Medical University	Peshawar, Pakistan	Nov 2020 – Jun 2021	Six-month certification
2020	Provisional Supervisor – Clinical Cardiac Electrophysiology	Approved Supervisor	College of Physicians & Surgeons Pakistan (CPSP)	Karachi / Peshawar	05 Aug 2020	CPSP ID: 2007-1205
2020	Online Academic Lecture: Management of Heart Failure	Speaker	Pharmaceutical Academic Program	Virtual	08 Oct 2020	Certificate of Appreciation
2019	Clinical Training in Cardiac Electrophysiology	Trainee	Taipei Veterans General Hospital	Taipei, Taiwan	01 Aug – 16 Sep 2019	International training

Dr. Samiullah – Assistant Professor

No.	Activity / Event Title	Type	Role	Organizer / Institution	Venue / Mode	Year / Date	Remarks
1	Euro CTO 2024	International Conference	Participant	EuroCTO Club	Europe	2024	Certificate of Participation
2	TCT (Transcatheter Cardiovascular Therapeutics)	International Conference	Participant	Cardiovascular Research Foundation (CRF)	USA / International	—	Attendance certificate
3	TCT Session	International Conference	Speaker	CRF – TCT	International	—	Speaker certificate
4	Quality Review Course (QRC-4/22)	Course / Training	Participant	CPSP	Pakistan	2022	Postgraduate education
5	Ethical MedTech Program	Online Training	Participant	Ethical MedTech / MedTech Europe	Online	—	Compliance & ethics training
6	Academic CME / Workshop	CME / Workshop	Speaker	PGMI / Cardiology Dept.	Pakistan	—	Speaker role documented
7	Cardiology Academic Session	CME / Academic Activity	Participant	Institutional	Pakistan	—	Attendance verified

Dr. Nasir Ali – Assistant Professor

S. No.	Activity Type	Title / Area	Institution / Organizer	Date(s)	Venue	Role
1	Post-Fellowship Training	Interventional Cardiology	NICVD	08-01-2020 to 07-01-2022	Karachi	Trainee
2	International Fellowship	Cath Lab & Interventional Cardiology	Erciyes University Hospital	15-06-2022 to 15-10-2022	Kayseri, Turkey	Fellow
3	Industry Training	TAVI Team Approach Training	Medtronic Training Academy	28-29-06-2025	Islamabad	Participant
4	Workshop	Carotid Wallstent Workshop	Boston Scientific	26-09-2024	Rawalpindi Institute of Cardiology	Participant
5	CME Workshop	Basics of Angiography	PGMI (DME)	21-11-2024	PGMI Clinical Skills Lab	Participant & Speaker
6	CME Workshop	Rotablation Simulation	PGMI (DME)	02-10-2025	MTI-HMC Peshawar	Participant & Speaker

7	CME Activity	Mock Examination FCPS-II Cardiology	CPSP / PGMI	04-11-2023	CPSP Regional Center, Peshawar	Examiner
8	CME Activity	Mock Examination FCPS-II Cardiology	CPSP / PGMI	31-05-2024	CPSP Regional Center, Peshawar	Examiner
9	CME Activity	Mock Examination FCPS-II Cardiology	PGMI (DME)	04-06-2025	MTI-HMC Peshawar	Examiner
10	CME Workshop	Teaching & Assessment Techniques	PGMI (DME)	19-20-03-2025	MTI-HMC Peshawar	Participant
11	CME Conference	In Prevention Lies Our Salvation	PGMI (DME)	03-04-01-2026	PGMI Auditorium	Participant
12	International Conference	ESC Congress / World Congress of Cardiology	European Society of Cardiology	29-08-2025 to 01-09-2025	Madrid, Spain	Delegate
13	Academic Notification	Designation Change (Stroke & Peripheral Interventions)	KGMC / BoG MTI-HMC	08-03-2023	Peshawar	Official Appointment

Clinical Audits

1. Introduction

The Department of Cardiology, MTI–Hayatabad Medical Complex, is committed to **continuous quality improvement, patient safety, and evidence-based clinical practice**. Clinical audits are conducted regularly to evaluate adherence to national and international guidelines, identify gaps in care, implement corrective actions, and monitor improvements. Audits follow the **Plan-Do-Study-Act (PDSA)** cycle and are aligned with CPSP, institutional, and WHO standards.

2. Audit Framework

All clinical audits in the department are structured as follows:

- **Plan:** Topic selection based on clinical priority, guideline review, and criterion setting
- **Do:** Data collection through retrospective or prospective review
- **Study:** Analysis against standards, identification of gaps
- **Act:** Recommendations, action plan assignment, implementation, and re-audit

3. Summary of Clinical Audits (2024–2025)

Sr.	Audit Title	Lead	Date	Key Finding	Recommendation	Status
1	Culture Sampling Before Antibiotic Initiation	Dr. Yamna Ali	May 2025	Culture sampling rate <20% before antibiotic start	Mandatory culture before 1st antibiotic dose	In Progress
2	Daily Electrolyte Monitoring in HF Patients	Dr. Owais Khan	Feb 2025	Only 16% had daily electrolytes monitored	Introduce daily electrolyte checklist	Planned

	on IV Diuretics					
3	Day-3 Inflammatory Markers for Antibiotic Escalation/De-escalation	Dr. Yamna Ali	Jun 2025	Day-3 ESR/CRP/Procalcitonin rarely obtained	Mandatory Day-3 inflammatory markers	In Progress
4	Empirical Antibiotic Therapy & Antibiogram Requirement	Dr. Yamna Ali	Aug 2025	Wide variation due to lack of hospital antibiogram	Develop hospital antibiogram; interim use of national guidelines	Planned
5	Time-to-Correction in Severe Hypokalemia	Dr. Owais Khan	Mar 2025	Only 10% corrected within 1 hour	Implement rapid electrolyte correction protocol	Completed
6	Iron Deficiency Screening & Correction in Heart Failure	Dr. Owais Khan	Apr 2025	Very low screening rates; IV iron rarely given	Routine iron profile for all HF admissions	In Progress
7	Mediterranean Diet Discharge Counselling & Diet Chart	Dr. Owais Khan	Jun 2025	Very few patients received structured diet advice	Display and distribute standardized Mediterranean diet chart	In Progress

4. Detailed Audit Reports

Audit 1: Culture Sampling Before Antibiotic Initiation

- **Date:** 20 May 2025
- **Lead:** Dr. Yamna Ali
- **Standard:** IDSA/SHEA guidelines – cultures before first antibiotic dose
- **Sample:** 50 consecutive patients started on antibiotics

- **Finding:** Culture sampling rate <20%
- **Recommendation:** Mandatory culture sampling before first antibiotic dose
- **Action:** SPRs to enforce; re-audit in 3 months
- **Status:** In progress
- **Evidence:** Attached minutes (CULTURE BEFORE ANTIBIOTICS.docx)

Audit 2: Daily Electrolyte Monitoring in HF Patients on IV Diuretics

- **Date:** 20 February 2025
- **Lead:** Dr. Owais Khan
- **Standard:** ESC heart failure guidelines
- **Sample:** 30 heart failure patients on IV diuretics
- **Finding:** Only 16% had daily electrolytes monitored
- **Recommendation:** Implement daily electrolyte monitoring checklist
- **Action:** Ward incharge to supervise; re-audit scheduled
- **Status:** Planned
- **Evidence:** Attached minutes (DAILY ELECTROLYTES.docx)

Audit 3: Day-3 Inflammatory Markers for Antibiotic Escalation/De-escalation

- **Date:** 20 June 2025
- **Lead:** Dr. Yamna Ali
- **Standard:** Local antibiotic policy
- **Sample:** 40 patients on antibiotics >3 days
- **Finding:** Day-3 markers rarely obtained
- **Recommendation:** Mandatory Day-3 ESR/CRP/Procalcitonin
- **Action:** SPRs to reinforce; re-audit assigned
- **Status:** In progress
- **Evidence:** Attached minutes (DAY-3 INFLAMMATORY MARKERS.docx)

Audit 4: Empirical Antibiotic Therapy & Antibiogram Requirement

- **Date:** 20 August 2025

- **Lead:** Dr. Yamna Ali
- **Standard:** National antibiotic guidelines
- **Sample:** Prescribing patterns in cardiology ward
- **Finding:** Wide variation due to lack of hospital antibiogram
- **Recommendation:** Develop hospital-specific antibiogram
- **Action:** Formal request to Microbiology Department; interim use of national guidelines
- **Status:** Planned
- **Evidence:** Attached minutes (EMPIRICAL ANTIBIOTIC THERAPY & ANTIBIOGRAM.docx)

Audit 5: Time-to-Correction in Severe Hypokalemia

- **Date:** 20 March 2025
- **Lead:** Dr. Owais Khan
- **Standard:** Correction within 1 hour (institutional protocol)
- **Sample:** 20 cases of severe hypokalemia (K+ <3.0)
- **Finding:** Only 10% corrected within 1 hour
- **Recommendation:** Implement rapid electrolyte correction protocol
- **Action:** "Electrolyte Response Person" assigned per shift
- **Status:** Completed
- **Evidence:** Attached minutes (HYPOKALEMIA CORRECTION TIME.docx)

Audit 6: Iron Deficiency Screening & Correction in Heart Failure

- **Date:** 20 April 2025
- **Lead:** Dr. Owais Khan
- **Standard:** ESC heart failure guidelines
- **Sample:** 190 heart failure admissions
- **Finding:** Very low ferritin/TSAT testing; IV iron rarely given
- **Recommendation:** Routine iron profile for all HF admissions

- **Action:** PGRs to start IV iron in eligible patients
- **Status:** In progress
- **Evidence:** Attached minutes (IRON DEFICIENCY IN HF.docx)

Audit 7: Mediterranean Diet Discharge Counselling & Diet Chart

- **Date:** 20 June 2025
- **Lead:** Dr. Owais Khan
- **Standard:** ESC prevention guidelines
- **Sample:** Discharge counselling practices
- **Finding:** Very few patients received Mediterranean diet advice
- **Recommendation:** Display and distribute standardized diet chart
- **Action:** Diet chart developed with Nutrition Department; orientation session planned
- **Status:** In progress
- **Evidence:** Attached minutes (MEDITERRANEAN DIET & CHART.docx)

5. Evidence of Implementation & Governance

- All audit minutes are **digitally prepared, reviewed, and approved** by the Chairman of Cardiology and the Manager of Quality Assurance.
- **Certificates of audit leadership** are maintained (e.g., Dr. Shah Sawar Khan – Clinical Audit Lead, 20 Jan 2025).
- Action items are tracked in **monthly departmental quality meetings**.
- Re-audits are scheduled to ensure **closure of the audit cycle**.

6. Impact & Outcomes

- **Improved electrolyte management** post-hypokalemia audit.
- **Increased awareness** of culture-before-antibiotic policy.
- **Structured diet counselling** initiated for cardiac patients.
- **Protocol development underway** for antibiogram and daily electrolyte monitoring.

7. Future Audit Plan (2025–2026)

1. Door-to-balloon time in STEMI patients
2. Contrast-induced nephropathy prevention in diabetic patients
3. Heart failure 30-day readmission rates
4. Medication reconciliation at discharge
5. Compliance with dual antiplatelet therapy post-PCI

Faculty Development Program

Programs currently enrolled in

1. **Dr. Muhammad Asghar Khan** is currently enrolled in the Master of Health Research (MHR) program at Khyber Medical University (KMU), Peshawar.
2. **Dr. Shah Sawar Khan** is currently **enrolled** in a **Master's program in HealthCare Hospital Management and Diploma in Health Professional Education.**
3. **Dr. Zahoor Ahmad Khan** is currently **enrolled** in a **Diploma in Health Professional Education.**
4. **Dr. Samiullah** has successfully completed the Master of Health Research (MHR) program.

Additional Qualifications achieved

1. **Dr. Muhammad Asghar Khan** – FCPS Medicine
2. **Dr. Zahoor Ahmad Khan** – FCPS Electrophysiology

List of Faculty members

S.No	Name	Designation	PMDC/PMC

1.	Dr. Shah Sawar Khan	HEAD & Associate Professor	10239-N
2.	Dr. Mahmood Ul Hassan	Professor	5669-N
3.	Dr. Hameedullah	Associate Professor	9506-N
4.	Dr. Muhammad Asghar Khan	Associate Professor	7055-N
5.	Dr. Zia Ullah	Associate Professor	5353-N
6.	Dr. Zahoor Ahmad Khan	Associate Professor	10989-N
7.	Dr. Samiullah	Assistant Professor	14541-N
8.	Dr. Nasir Ali	Assistant Professor	15204-N
9.	Dr. Yasir Hayat	Assistant Professor	13805-N
10.	Dr. Muhammad Niaz Khan	Assistant Professor	16672-N
11.	Dr. Asadullah	Assistant Professor	

with appointment letters and PMDC faculty Registration certificates

Additional Department HR (support staff)

EXISTING:

S.No	Position	Number Available

		General Cardiology	Interventional Cardiology	Electrophysiology	Stroke Intervention	Peripheral VD	Paeds Cardiology
1.	Professor	00	01	00	00	00	00
2.	Associate Professor	01	01	02	00	00	01
3.	Assistant Professor	00	01	00	02	01	01
4.	SPR	05	00	00	00	00	01
5.	Trainee Registrar	00	00	00	00	00	00
6.	Medical Officer	01	00	00	00	00	01
7.	Nurse	05	08	04			06
8.	Computer Operator	01	02	00	00	00	01
9.	Receptionist	01	03	00	00	00	00
10	Ward Boy/ Khala	03	07	02			04
11	Sweeper	04	04	04			03

REQUIRED HR:

S.No	Position	Number Available					
		General Cardiology	Interventional Cardiology	Electrophysiology	Stroke Intervention	Peripheral VD	Paeds Cardiology
1.	Professor	02	00	00	00	00	01
2.	Associate Professor	02	01	00	00	00	00
3.	Assistant Professor	02	02	00	02	01	01
4.	SPR	03	03	01	00	00	03
5.	Trainee Registrar	00	00	00	00	00	00
6.	Medical Officer	00	00	00	00	00	00
7.	Nurse	15	03	02			06
8.	Computer Operator	02	02	01	00	00	01
9.	Receptionist	05	02	02	00	00	03
10	Ward Boy/ Khala	04	03	01			02
11	Sweeper	02	00	00			01

Additional information

Academic Activity Record

Name	Activity	Role	Institution
Prof Mahmood Ul Hassan	Monthly BLS & ACLS Courses	Organizer & Instructor	PGMI / LRH
Dr. Shah Sawar Khan	BLS Course	Organizer & Instructor	Skill Lab PGMI/HMC
Dr. Muhammad Asghar Khan	ELS Course (for new HOs)	Organizer & Instructor	KGMC/HMC
Dr. Zahoor Ahmad Khan	ELS Course (for new HOs)	Organizer & Instructor	KGMC/HMC