Training Program for Postgraduate Neurology Trainees

MUHAS (Tanzania)

Clinical Training at CMC Vellore, India

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1. Program Overview

Purpose

- To provide focused subspecialty exposure in **high-volume tertiary neurology practice**
- To strengthen:
    - Clinical reasoning
    - Neurodiagnostic skills
    - Neurocritical care competencies
    - Evidence-based management

Duration

- **Total duration:** 6 months (one semester)
- **Structure:**
    - Month 1 and 2 – General Neurology (Foundation)
    - Months 3–6 – Subspecialty rotations:
        - Neurocritical Care
        - Stroke Medicine
        - Clinical Neurophysiology
        - Neuroimaging

Target trainees

- Postgraduate neurology residents from **MUHAS**
- Equivalent to mid-level neurology residency stage

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2. Core Training Philosophy

The curriculum is designed around **three pillars of competency development:**

A. Knowledge

- Understanding pathophysiology-based clinical reasoning
- Exposure to guideline-driven management

- Familiarity with diagnostic algorithms

B. Skills

- Bedside neurological examination refinement
- Procedural competence
- Interpretation of neurodiagnostic tests

C. Professional Development

- Multidisciplinary teamwork
- Ethical decision-making
- Resource-appropriate care models relevant to LMIC settings

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3. Training Structure and Rotations

MONTH 1 and 2 — GENERAL NEUROLOGY (FOUNDATION)

Objectives

- Develop structured clinical approach to neurological disorders
- Build competency in localization and differential diagnosis
- Learn inpatient and outpatient workflow

Clinical Exposure

A. Inpatient Care

- Daily ward rounds
- Case documentation
- Management planning

B. Outpatient Clinics

- New patient evaluation
- Chronic disease management
- Follow-up strategies

Academic Activities

- Daily case presentations
- Bedside teaching rounds

- Weekly seminars
- Neuroanatomy–clinical correlation sessions

Skills Training

- Neurological examination mastery
- Localization exercises
- Documentation standards

MONTH 3 — NEUROCRITICAL CARE

Objectives

- Understand neurocritical pathophysiology
- Learn acute neurological emergency management
- Develop monitoring and procedural skills

Core Competencies

A. Clinical Management

- Raised intracranial pressure syndromes
- Status epilepticus
- Neuromuscular respiratory failure
- Acute encephalopathy
- Post-operative neurosurgical care

B. Monitoring Skills

- Neuro-vital assessment
- ICP monitoring principles
- Hemodynamic optimization
- Ventilator strategies in neurological patients

C. Procedures (Observation/Assisted)

- Lumbar puncture in ICU
- Central line insertion
- Airway management principles

Academic Components

- ICU case discussions
- Mortality audits
- Evidence-based neurocritical protocols

MONTH 4 — STROKE MEDICINE

Objectives

- Develop expertise in acute stroke evaluation and management
- Understand stroke systems of care

Core Clinical Exposure

A. Acute Stroke Care

- Hyperacute stroke triage
- Thrombolysis protocols
- Mechanical thrombectomy workflow

B. Stroke Subtypes

- Ischemic stroke mechanisms
- Hemorrhagic stroke management
- Stroke in young
- Cerebral venous thrombosis

C. Secondary Prevention

- Risk factor modification
- Antithrombotic therapy

- Rehabilitation planning

Diagnostic Skills

- NIHSS scoring
- Stroke imaging interpretation
- Etiologic classification (TOAST)

Academic Components

- Stroke case conferences
- Journal clubs
- Quality improvement audits

MONTH 5 — CLINICAL NEUROPHYSIOLOGY

Objectives

- Gain competency in electrophysiological testing principles
- Develop interpretation skills

Exposure Areas

A. EEG

- Routine EEG interpretation
- ICU EEG monitoring
- Epileptiform vs non-epileptiform patterns

B. EMG & Nerve Conduction

- Peripheral neuropathy evaluation
- Neuromuscular junction disorders
- Myopathy patterns

C. Evoked Potentials

- Visual evoked potentials
- Brainstem auditory evoked potentials
- Somatosensory evoked potentials
- Autonomic function testing and interpretation
- Transcranial doppler

Skills

- Indication selection
- Basic technical understanding
- Clinical correlation

Academic Activities

- Pattern recognition sessions
- Electrophysiology case discussions

MONTH 6 — NEUROIMAGING

Objectives

- Develop structured neuroimaging interpretation skills
- Understand imaging-pathophysiology correlations

Core Areas

A. MRI Interpretation

- Stroke imaging
- Demyelinating disorders
- Neurodegeneration
- Tumors and infections

B. CT Interpretation

- Emergency neuroimaging

- Trauma patterns
- Hemorrhage classification

C. Advanced Imaging

- Perfusion imaging
- MR spectroscopy
- Functional imaging basics

Skills

- Structured reporting approach
- Imaging-clinical correlation
- Recognizing red-flag findings

Academic Components

- Daily imaging rounds
- Radiology-neurology joint conferences

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4. Teaching Methods

- Bedside teaching
- Case-based learning
- Multidisciplinary rounds
- Simulation sessions
- Journal clubs
- Interactive seminars

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5. Evaluation Methods

Formative Assessment

- Case presentations
- Direct observation of clinical skills

Summative Assessment

- Objective structured clinical assessment
- Logbook review

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6. Expected Competency Outcomes

At completion, trainees should demonstrate:

Clinical Competence

- Structured neurological evaluation
- Emergency neurological management

Diagnostic Competence

- Interpretation of neurodiagnostic tests
- Imaging correlation skills

Professional Competence

- Team communication
- Ethical decision-making
- Systems-based practice

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7. Program Supervision

- Faculty mentor assigned
- Monthly performance review
- Feedback sessions

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8. Integrating into Weekly Schedule

Activity	**Frequency**
Ward rounds	Daily
Outpatient Clinics	3/week, specialty clinics on Wednesdays
Teaching sessions	Daily
Journal club	Weekly (Monday)
Seminar	Weekly (Tuesday)
Case conference	Weekly (Thursday)

Activity	Frequency
Electrophysiology conference	Weekly (Friday)
Combined session with Neurosurgery	Weekly (Saturday)

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9. Certification

- Certificate issued jointly by:
    - CMC Vellore
    - MUHAS Neurology Program