

# **GUIDELINES FOR COMPETENCY BASED POST GRADUATE TRAINING PROGRAMME FOR MD IN TROPICAL MEDICINE**

## **Preamble**

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training.

The Tropical Medicine programme is designed to provide the nation with specialist who are trained to address unique needs of patients in tropical environments that may not be emphasized in conventional/ traditional medicine training programs. MD (Tropical Medicine) will provide the ideal opportunity to tune the objectives of the post graduate level training in internal medicine to the health care needs of the nation.

The purpose of this document is to provide teachers and learners illustrative guidelines to achieve defined outcomes through learning and assessment. This document was prepared by various subject-content specialists. The Reconciliation Board of the Academic Committee has attempted to render uniformity without compromise to purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of “domains of learning” under the heading “competencies”.

## ***SUBJECT SPECIFIC OBJECTIVES***

The **goal** of the programme is to produce a physician who is well-informed of the health care needs of tropical countries with special reference to the Indian subcontinent. It would train and equip him/her with knowledge and skills necessary to address these health care needs by efficiently utilising the available resources. The student should also be able to identify priority areas of health care needs and apply the scientific method to find feasible, relevant, and cost-effective solutions to meet these health care needs.

For a physician who wishes to engage in clinical practice, this programme will offer a balanced training in all aspects of the health care needs of a whole family, not just individuals in certain age-groups. In short, this programme would be an integrated, comprehensive yet context-specific, utility-based, post graduate level training in modern medicine.

## ***SUBJECT SPECIFIC COMPETENCIES***

**By the end of the course, the student should have acquired knowledge (cognitive domain), professionalism (affective domain) and skills (psychomotor domain) as given below:**

## **A. Cognitive Domain**

At the completion of training, a post graduate in Tropical Medicine must be able to:

1. Independently practice clinical tropical medicine, i.e. to approach and solve clinical problems, diagnose, and appropriately treat various tropical diseases
2. Appropriately manage common medical (non-communicable diseases included), maternal and childhood health problems prevalent in tropical settings
3. Offer advice on tropical diseases to specialists in other fields and liaise with them in the care of patients
4. Identify areas of health care need and apply the scientific principles to find/suggest solutions
5. Should be able to advise international travelers on prevention of locally prevalent diseases
6. Teach tropical medicine to undergraduate and post graduate students

## **B. Affective Domain:**

1. Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion.
2. Always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.
3. Develop communication skills to word reports and professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and for effective teaching.

## **C. Psychomotor domain**

**At the end of the course, the student should acquire following clinical skills and be able to:**

- elicit the relevant clinical history from patients in a coherent and logical manner and perform a complete physical examination of all organ systems.
- interpret the symptoms/physical signs in pathological terms and chalk out the possible course of action such as relevant laboratory investigations and treatment.
- interpret the laboratory findings in the context of the patient's illness.
- appropriately manage the disease condition including drug treatment and its side effects.

At the completion of training, the student should be capable of independent clinical practice in tropical medicine and in managing medical emergencies independently by acquiring the following **practical skills**:

- Cardio-pulmonary resuscitation including advanced cardiac life support and endotracheal intubation
- Diagnostic and therapeutic thoracocentesis, abdominal paracentesis
- Lumbar puncture
- Cell count on body fluids such as cerebrospinal, pleural, and peritoneal fluid
- Bone marrow aspiration, trephine bone biopsy
- Fine-needle aspiration of lymph node
- Short-term peritoneal dialysis
- Arterial puncture, central venous cannulation, peripheral venous cannulation
- Nasogastric tube placement
- Indwelling urinary catheter placement
- Interpretation of chest radiographs, electrocardiographs, arterial blood gas analysis
- Funduscopy

The student should have acquired:

- **Laboratory skills** - sputum AFB staining, stool concentration and microscopy for parasites, identification of haemoparasites, bacterial cultures, basic laboratory techniques such as ELISA, PCR
- **Computer skills**

## *Syllabus*

### **Course contents:**

#### **1. Environmental disorders**

Heat stress and heat stroke, hypothermia, high-altitude illness, podoconiosis, adverse health consequences of tobacco (smoked and smokeless), air-pollution, indoor air-pollution, occupational lung diseases, health consequences of large-scale natural disasters such as famines, floods, tsunamis, earthquakes, land slides, forest fires, etc; health impacts of global warming

#### **2. Nutritional disorders**

Assessment of nutritional status, malnutrition, protein-energy malnutrition, specific nutrient deficiencies - iron, vitamin A, vitamin D, vitamin C, beri beri, pellagra, micronutrient deficiencies, alcoholism, endemic hypothyroidism, nutritional anaemia.

#### **3. Infectious diseases**

### **3a. Viral infections**

Acute and chronic viral hepatitis, arboviral infections, dengue fever and dengue haemorrhagic fever, chikungunya, varicella, measles, mumps, rubella, viral haemorrhagic fevers, Epstein-Barr virus infection, rabies, viral gastroenteritis, viral respiratory infections, cutaneous viral infections - molluscum contagiosum, viral warts, hand-foot-mouth disease, viral infections of the central nervous system, poliomyelitis, HIV/AIDS, HIV-related opportunistic conditions; National AIDS Control Programme, NACO guidelines on management of HIV/AIDS

### **3b. Rickettsial infections**

### **3c. Bacterial infections**

Acute diarrhoeal illness, cholera, typhoid and paratyphoid, non-typhoidal Salmonella infections, shigellosis, pneumococcal infections, impetigo, erysipelas, acute bacterial meningitis, meningococcal infections, pulmonary and extrapulmonary tuberculosis, non-tuberculous mycobacterial diseases, leprosy, anthrax, brucellosis, tetanus, diphtheria, plague, melioidosis, gonorrhoea, syphilis and other sexually transmitted infections, endemic treponematoses, leptospirosis, sepsis, infective endocarditis, tropical pyomyositis, urinary tract infections, otitis media, cerebral abscess, trachoma.

### **3d. Fungal infections**

Superficial fungal infections, candidiasis, mycetoma, systemic fungal infections including histoplasmosis and penicilliosis, *Pneumocystis jirovecii* infection.

### **3e. Protozoan infections**

Malaria, hyperreactive malarial splenomegaly, African trypanosomiasis, American trypanosomiasis, leishmaniasis, toxoplasmosis, amoebiasis, amoebic liver abscess, giardiasis, pathogenic free-living amoeba, trichomoniasis.

### **3f. Helminthic infections**

Soil-transmitted helminths, filariasis, onchocerciasis, hydatidosis, cysticercosis, schistosomiasis, food-borne trematodes.

### **3g. Ectoparasites**

Pediculosis, scabies, myiasis, arthropod dermatoses, insect stings, bites, allergies.

### **3h. Miscellaneous**



Vaccinations - childhood and adults, advice to international travelers.

#### **4. Tropics-specific organ-limited diseases**

Acute rheumatic fever, rheumatic heart disease, endomyocardial fibrosis, tropical pulmonary eosinophilia, parasitic pulmonary diseases, tropical pancreatitis, tropical sprue, haemoglobinopathies, G6PD-deficiency.

#### **5. Poisoning**

General management of the poisoned patient, toxidromes, organophosphorus poisoning, organocarbamate/chlorine poisoning, aluminium phosphide poisoning, copper sulphate poisoning, heavy metal poisoning - lead, arsenic, thallium, and mercury, inhalant substance abuse and corrosive ingestion, snake bite and snake envenomation, animal bites, scorpion stings, yellow oleander poisoning, mushroom poisoning, other plant poisons, lathyrism, aflatoxin, epidemic dropsy, fluorosis.

#### **6. Internal medicine**

Epilepsy, Guillain-Barre syndrome, Alzheimer's dementia, Parkinson's disease, osteoarthritis, infectious arthritis, reactive arthritis, fibromyalgia, somatoform disorders, depression, anxiety disorder, peptic ulcer disease, irritable bowel syndrome, acute intestinal obstruction, bronchial asthma, chronic obstructive pulmonary disease, bronchiectasis, lung abscess, pleural effusion, empyema, congestive heart failure, pericardial effusion, acid-base and electrolyte disorders, management of acute/chronic renal failure, skin manifestations of internal disease, adverse drug reactions, principles of transfusion therapy and transfusion-related complications, approach to fever of unknown origin, diagnostic evaluation of anaemia, diabetes mellitus, hypertension, coronary artery disease, cerebrovascular disease, low-cost management and prevention of non-communicable diseases, cancers prevalent in tropical settings.

#### **7. Medical emergencies**

Severe dehydration, acute myocardial infarction, malignant hypertension, acute stroke, status epilepticus, acute severe asthma, pneumothorax, hypoglycaemia, diabetic ketoacidosis, acute pancreatitis, approach to an unresponsive patient, heat stroke, septic shock and severe sepsis, oxygen therapy.

#### **8. Child health**

Pattern of morbidity and mortality in children, management of common childhood illnesses such as acute respiratory infections, pneumonia, gastroenteritis, dehydration, tuberculosis in children, expanded immunization programme, Vitamin A prophylaxis, IDD control programme; common dietary sources, assessment of nutritional status based on history and physical examination, protein energy

malnutrition - identification, classification; causes and management including complications, planning diet for protein-energy malnutrition; breastfeeding; vitamin deficiency disorders.

## **9. Maternal health**

Antenatal care, immunisation against tetanus, abortion, septic abortion, hyperemesis gravidarum, conduct of labour, complications of labour, postpartum haemorrhage, injuries to the lower genital tract, foetal distress and foetal death, pregnancy induced hypertension, eclampsia, complications of eclampsia; anaemia in pregnancy, other medical disorders like heart disease/ diabetes mellitus and urinary tract infection, liver diseases in pregnancy, care of newborn, common problems in the new born, Medical Termination of Pregnancy, contraception.

## **10. Public health**

Applied epidemiology of infectious diseases (tuberculosis, HIV/AIDS, malaria, typhoid fever, dengue, hookworm infestation, filariasis, Japanese B encephalitis, chikungunya, leptospirosis, leprosy), non-communicable diseases (obesity, hypertension, cardiovascular disease), environmental diseases (arsenic, lathyrism, aflatoxin), occupational diseases, poisoning, and nutritional disorders in developing countries, "Disease Control Priorities in Developing Countries", micro- and macro-economics of health, social determinants of health, poverty and disparity in health care, concepts of environmental engineering, health policy making and cost-effectiveness issues, national disease control programmes in India; preventive tropical medicine.

## **11. Clinical epidemiology and research methodology**

### ***11a. Study designs***

Observational vs. interventional studies, cross-sectional vs. longitudinal, case-control, cohort studies, randomised controlled trials

### ***11b. Methodology***

Sample size estimation, sampling and measurement errors, sampling strategies, bias, confounding, interaction, clinical trials - random allocation, blinding, allocation concealment, parallel vs. cross-over design, factorial design.

### ***11c. Basics of medical statistics***

Types of data, descriptive statistics, confidence intervals, bivariate analysis - categorical vs. continuous, categorical vs. categorical, continuous vs. continuous, concepts of multivariable analysis, absolute risk reduction, numbers needed to treat/harm, statistical vs. clinical significance, association vs. causation.

### ***11d. Introduction to systematic reviews and meta-analysis***

What is a systematic review/meta-analysis? How to perform a systematic review?  
Pros and cons of meta-analyses.

### ***11e. Evidence-based medicine (EBM)***

What is EBM? Formulating the question - PICO format, searching for evidence, critical appraisal of evidence, and evidence synthesis.

## ***TEACHING AND LEARNING METHODS***

### **Postgraduate teaching programme**

#### **General principles**

Acquisition of practical competencies being the keystone of PG medical education, PG training should be skills oriented. Learning in PG program should be essentially self-directed and primarily emanating from clinical and academic work. The formal sessions are merely meant to supplement this core effort.

#### **Teaching methodology**

This should include regular bedside case presentations and demonstrations, didactic lectures, seminars, journal clubs, clinical meetings, and combined conferences with allied departments. The post graduate student should be given the responsibility of managing and caring for patients in a gradual manner under supervision. Department should encourage e-learning activities.

In addition to bedside teaching rounds, at least 5-hr of formal teaching per week is necessary. Other requisites are:

- Additional sessions on resuscitation, basic sciences, biostatistics, research methodology, teaching methodology, hospital waste management, health economics, medical ethics and legal issues related to medical practice are suggested.
- There should be a training program on Research methodology for existing faculty to build capacity to guide research.
- The postgraduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.
- A postgraduate student of a postgraduate degree course in broad specialities/super specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the

period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.

- **Log book:** During the training period, the post graduate student should maintain a Log Book indicating the duration of the postings/work done in Wards, OPDs and Casualty. This should indicate the procedures assisted and performed, and the teaching sessions attended. The Log book shall be checked and assessed periodically by the faculty members imparting the training.
- Department should encourage e-learning activities.

Due to the multidisciplinary nature of the programme and the lack of established Tropical Medicine departments in most medical colleges, it is imperative that an Academic Committee of all involved departments be formed with one key faculty from each of these departments identified and vested with the responsibility of coordination. However, the overall administrative control should be with the Department of Internal Medicine, in the absence of an established Department of Tropical Medicine.

#### **Rotations:**

The total duration of training is 36 months. The first 6 months should be spent in Internal Medicine learning general principles of internal medicine and clinical medicine.

Rotations should include clinical training as given below:

- 01 month in Paediatrics
- 01 month in Obstetrics
- at least 01, preferably 02, active externships (active clinical duties, not mere observership) of at least 01 month, preferably 02 months, each
- 02 months in a primary care set-up (primary health centre)
- 02 months in emergency medical services
- 02 months in Cardiology
- 02 months in Neurology
- 01 month in Nephrology
- 01 month in Endocrinology/diabetes care
- 01 month in Gastroenterology
- 03 months of laboratory work in general Microbiology, parasitology, and virology laboratory; remaining time should be spent in Internal Medicine.

At least 30 hours of instruction in clinical epidemiology/research methodology is required.

#### **Thesis**



All MD (Tropical Medicine) post graduate students should carry out work on an assigned topic under the direct guidance of a recognised post graduate teacher. A written protocol of the proposed work should be submitted before the end of the first 6 months. Subsequently, the post graduate student should carry out the proposed work for at least one year (not inclusive of the period for submitting the protocol and writing-up the final thesis).

**During the training programme, patient safety is of paramount importance, therefore skills are to be learnt initially on the models, later to be performed under supervision followed by performing independently; for this purpose, provision of skills laboratories in medical colleges is mandatory.**

## ***ASSESSMENT***

### **FORMATIVE ASSESSMENT, ie, during the MD training**

**Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self directed learning and ability to practice in the system.**

#### **General Principles**

Internal Assessment should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills. The Internal Assessment should be conducted in theory and clinical examination.

**Quarterly assessment during the MD training should be based on:**

- 1. Journal based / recent advances learning**
- 2. Patient based /Laboratory or Skill based learning**
- 3. Self directed learning and teaching**
- 4. Departmental and interdepartmental learning activity**
- 5. External and Outreach Activities / CMEs**

**The student to be assessed periodically as per categories listed in postgraduate student appraisal form (Annexure I).**

### **SUMMATIVE ASSESSMENT, at the end of three years:**

The summative examination would be carried out as per the Rules given in **POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 2000.**

**The Post Graduate Examination shall be in three parts:**

## **1. Thesis:**

Every post graduate student shall carry out work on an assigned research project under the guidance of a recognised Post Graduate Teacher, the result of which shall be written up and submitted in the form of a Thesis. Work for writing the Thesis is aimed at contributing to the development of a spirit of enquiry, besides exposing the post graduate student to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature.

Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination. A post graduate student shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners.

## **2. Theory Examination:**

The examinations shall be organised on the basis of 'Grading' or 'Marking system' to evaluate and to certify post graduate student's level of knowledge, skill and competence at the end of the training. Obtaining a minimum of 50% marks in 'Theory' as well as 'Practical' separately shall be mandatory for passing examination as a whole. The examination for M.D./ MS shall be held at the end of 3<sup>rd</sup> academic year. An academic term shall mean six month's training period.

It should have 4 theory papers:

**Paper I:** General tropical medicine and basic sciences;

**Paper II:** Clinical tropical medicine including internal medicine and medical emergencies;

**Paper III:** Clinical tropical medicine including maternal and child health, public health;

**Paper IV:** Recent advances in tropical medicine, research methodology, and clinical epidemiology.

The final qualifying examination should include an assessment of clinical skills in the form of case presentations and discussions.

## **3. Practical/Clinical and Oral/viva voce Examination:**

The case-based discussions should involve at least 2 long cases in clinical tropical medical problems, and 1 short case each in maternal and child health. Other rules laid down by the MCI regarding M.D. examinations shall apply here as well.

**Oral/viva voce Examination** shall be thorough and shall aim at assessing the knowledge and competence of the post graduate student on the subject, investigative procedures, therapeutic technique and other aspects of the specialty which form a part of the examination.

**Recommended Reading:**

**Books (latest edition)**

1. Cook GC, Zumla A, editors. *Manson's Tropical Diseases*. Published by WB Saunders.
2. Guerrant RL, Walker DH, Weller PF, editors. *Tropical Infectious Diseases: Principles, Pathogens & Practice*. Published by Churchill Livingstone.
3. Fauci AS, Braunwald E, Kasper DL, Hauser SL, Longo DL, Jameson JL, Loscalzo J, editors. *Harrison's Principles of Internal Medicine*. Published by McGraw-Hill.
4. Boon NA, Colledge NR, Walker BR, Hunter J, editors. *Davidson's Principles and Practice of Medicine*. Published by Churchill Livingstone.
5. Strachan M, Sharma SK, Hunter JA, editors. *Davidson's Clinical Cases*. Published by Churchill Livingstone.
6. Eddleston E, Davidson R, Brent A, Wilkinson R. *Oxford Handbook of Tropical Medicine*. Published by Oxford University Press.
7. Peters W, Pasvol G. *Atlas of Tropical Medicine and Parasitology*. Published by Mosby.
8. Park K, editor. *Park's Textbook of Preventive and Social Medicine*. Published by Banarasidas Bhanot Publishers.
9. Detels R, McEwen J, Beaglehole R, Tanaka H. *Oxford Textbook of Public Health*. Published by Oxford University Press.
10. Lopez AD, Mathers CD, Ezzati M, Jamison DT, Murray CJL, editors. *Global Burden of Disease and Risk Factors*. 1st edition. Published by World Bank Publications.
11. Jamison DT, Breman JG, Measham AR, Alleyne G, Claeson M, Evans DB, Jha P, Mills A, Musgrove P, editors. *Disease Control Priorities in Developing Countries*. Published by World Bank Publications.
12. Schulz K, Grimes DA, editors. *The Lancet Handbook of Essential Concepts in Clinical Research*. Published by Elsevier.
13. Bonita R, Beaglehole R, Kjellstrom T. *Basic Epidemiology*. Published by the World Health Organization.
14. Rothman KJ, Greenland S, Lash TL, editors. *Modern Epidemiology*. Published by Lippincott Williams & Wilkins.
15. Katz M, editor. *Study Design and Statistical Analysis: A Practical Guide for Clinicians*. Published by Cambridge University Press.

16. Altman DG, editor. *Practical Statistics for Medical Research*. Published by Chapman & Hall/CRC.
17. Greenhalgh T, editor. *How to Read a Paper: The Basics of Evidence-based Medicine*. Published by BMJ Books
18. Guyatt G, Rennie D, Meade M, Cook D, editors. *Users' Guides to the Medical Literature: Essentials of Evidence-Based Clinical Practice*. Published by McGraw-Hill Professional.

### **Journals**

03-05 international Journals and 02 national (all indexed) journals





**Postgraduate Students Appraisal Form**  
Pre / Para /Clinical Disciplines

Name of the Department/Unit :

Name of the PG Student :

Period of Training : FROM.....TO.....

| Sr. No. | PARTICULARS  | Not Satisfactory |   |   | Satisfactory |   |   | More Than Satisfactory |   |   | Remarks |
|---------|--|------------------|---|---|--------------|---|---|------------------------|---|---|---------|
|         |  | 1                | 2 | 3 | 4            | 5 | 6 | 7                      | 8 | 9 |         |
| 1.      | Journal based / recent advances learning             |                  |   |   |              |   |   |                        |   |   |         |
| 2.      | Patient based /Laboratory or Skill based learning    |                  |   |   |              |   |   |                        |   |   |         |
| 3.      | Self directed learning and teaching                  |                  |   |   |              |   |   |                        |   |   |         |
| 4.      | Departmental and interdepartmental learning activity |                  |   |   |              |   |   |                        |   |   |         |
| 5.      | External and Outreach Activities / CMEs              |                  |   |   |              |   |   |                        |   |   |         |
| 6.      | Thesis / Research work                               |                  |   |   |              |   |   |                        |   |   |         |
| 7.      | Log Book Maintenance                                 |                  |   |   |              |   |   |                        |   |   |         |

Publications

Yes/ No

Remarks\* \_\_\_\_\_  
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\_\_\_\_\_

\*REMARKS: Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.

SIGNATURE OF ASSESSEE

SIGNATURE OF CONSULTANT

SIGNATURE OF HOD