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POSTGRADUATE INSTITUTE OF MEDICINE
UNIVERSITY OF COLOMBO, SRI LANKA

PROSPECTUS

DOCTOR OF MEDICINE (MD)

AND

BOARD CERTIFICATION

IN

MEDICAL MICROBIOLOGY

2013

BOARD OF STUDY IN MICROBIOLOGY

CONTENTS

PROSPECTUS
MD and BOARD CERTIFICATION IN MEDICAL MICROBIOLOGY

BACKGROUND TO THE PROGRAMME:

The MD Medical Microbiology is the 2nd stage of a 3-part training programme conducted by the PGIM's Board of Study in Microbiology for those who wish to specialize in the field of Medical Microbiology. The first MD programme was conducted in the early 1980's. Since then it has been reviewed and revised on several occasions to serve the evolving needs of the country in relation to the field of Medical Microbiology, and taking into account changes in training capacity. The current MD training programme was first put into effect about 8 years ago. It consists primarily of in-service training in hospital microbiology laboratories, supplemented by other activities that reinforce specific, identified training needs. Training is conducted by designated trainers in several centers approved by the Board for this purpose.

RATIONALE FOR PROPOSED CHANGE

With a view to addressing the changing service needs in Microbiology in the health services, and changes in training capacity, the Board of Study has revised the curriculum for the first stage of its Microbiology training programme, the Diploma in Medical Microbiology. These changes have now been approved by the PGIM's AAAED and the Board of Management, and will be put into effect from those selected for training in 2011. These proposed changes in the MD Microbiology training programme are consequent to changes in the Diploma training programme, and will be put into effect for those who enter the MD training programme in January 2013.

1. LEARNING OUTCOMES

A. *Scientific Basis of Medical Microbiology*
- aetiology, pathogenesis, epidemiology and prevention of infectious diseases
- Laboratory investigations for the diagnosis of common bacterial, viral, fungal and parasitic diseases.
- sterilization procedures and laboratory investigations to check sterility
- antimicrobials and antimicrobial susceptibility testing of common pathogens

B. *Laboratory skills*
- process samples sent for routine microbiological investigations in a clinical diagnostic laboratory, or public health laboratory
- report on microbial pathogens in clinical samples and their antimicrobial susceptibility
- Work with due attention to quality assurance and laboratory safety.
- Instruct on collection and transportation of samples for microbiological diagnosis

C. *Laboratory Management*
- Manage the microbiological laboratory services and the work environment of a microbiology laboratory.

D. *Patient management*
- advise clinicians on the investigation and management of patients with infections
- use of antimicrobials

E. *Infection control*
- oversee infection control activities in the hospitals the trainee is working

F. *Public Health*
- work in an interdisciplinary team to investigate and control infectious diseases of public health importance

G. *Research*
- design, conduct and report on a short, medical microbiology related, research project

2. ENTRY CRITERIA

i. Hold a medical degree registered with the Sri Lanka Medical Council
ii. Complete an internship recognized by the Sri Lanka Medical Council
iii. Complete one year work experience in Sri Lanka, after internship
iv. Postgraduate Diploma in Medical Microbiology examination or the Postgraduate Diploma in Clinical Microbiology conducted by the PGIM. Not more than 4 years should have elapsed after the trainee has passed either examination.

3. SELECTION PROCESS

All those who fulfill the entry criteria stated in Section 2 will be admitted to the MD training programme provided they are released for training by their employers (Director-General Health Services, University Vice-Chancellors, private sector institutions etc).
In the event that the number to be released for training is less than the number who fulfill the entry criteria, selection of those to be released for training should be on the basis of merit order at the PGIM's Postgraduate Diploma in Medical Microbiology / Clinical Microbiology examination and number of attempts at the examination.
In the event that such selections must be made from among those who fulfill the entry criteria but have passed the said Diploma examination at different points in time, those who have passed most recently will be given priority, and those who passed in previous years will be placed at the bottom of the merit order.

4. INTAKE

The number will be decided by the BOM on the recommendation of *the BoS in Microbiology* * (which will depend on the available facilities, training sites and trainers in Microbiology) and in consultation with the Secretary, Ministry of Health.

5. DURATION OF TRAINING

2 years and 9 months (33 months)

6. FORMAT OF TRAINING PROGRAMME

The training programme will consist of the following components, with credit values as indicated:

Training component	Credits
A. Hospital Microbiology Laboratory appointments	60
B. Training workshops	4
C. Special appointments	8
D. Research project and dissertation	10
E. Tutorials in Clinical Parasitology	1
F. Tutorials in Medical Microbiology	6
Total	**89**

Outline of Postgraduate Diploma and MD Microbiology training programme

	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Y 1			Advertise				Select			Diploma taught course		
Y 2	Diploma taught course						Diploma in-service training					Dip exam

Y 3	**A 1.** hospital rotation		**B.** workshops in Antibiotics and Infection control/s	**C.** special appointments	**D.** research
Y 4	research project	**A 2**. hospital rotation 2		**A 3**. hospital rotation 3	
Y 5	hosp rot 3 ctd	**A 4** hospital rotation		MD exam	Post MD Y1

Y 6	Post MD training Year 1	Post MD Y2
Y 7	Post MD training Year 2	

A. Hospital Microbiology Laboratory appointments

Trainees are expected to complete a total of **24 months (104 weeks)** of appointments in hospital Microbiology laboratories under the direct supervision of the Consultant Microbiologists (who should also be eligible to be a MD trainer) in charge of the said laboratories.

A1. The 1st year of the MD training period shall begin with a 6-month appointment (A1, Year 1, January – June) in any one of the following hospital laboratories [1]

- National Hospital Sri Lanka
- Colombo South Teaching Hospital
- Colombo North Teaching Hospital
- Sri Jayewardenepura General Hospital
- Teaching Hospital Kandy
- Teaching Hospital Peradeniya
- Teaching Hospital Karapitiya
- General Hospital Ratnapura
- General Hospital Badulla
- General Hospital Kurunegala
- General Hospital Matara
- General Hospital Chilaw

After completion of training components B, C and D, trainees will rotate through training components, A2, A3 and A4 comprising of two , 24-week appointments in the above mentioned hospital laboratories, and two, 12 week appointments in NCI, Maharagama and LRH Colombo, during the 2nd and 3rd years.

The schedule of available hospital rotations will be made known to trainees at the commencement of MD training. Trainees will be permitted to select their rotation of choice according to merit order based on their Diploma examination results. In the event that there are trainees who have qualified for entry at different Diploma examinations, priority will be

[1] This list will be subject to revision based on availability of trainers and accreditation of the laboratory by the Board of Study.

given to those who have passed the Diploma most recently. Those who have passed the Diploma further back in the past will be placed at the bottom of the merit order.

Only one MD trainee from each batch of trainees will be allocated to a hospital (except the NHSL, which may have up to 2 trainees) at any given point in time. Once all available hospital laboratories have been allocated at least one trainee, and more trainees still need to be allocated training sites, a second trainee may be sent to a hospital laboratory with the consent of the relevant trainer.

Calculation of credits- On the basis that 45 hours of hospital laboratory based training under the direct supervision of a consultant Microbiologist is equivalent to one credit, this amounts to a total of ***60 credits*** *for 24 months of training.*

B. Training workshops

After completion of the 1st hospital laboratory appointment, trainees are required attend a **2-week training workshop on Antibiotics** and **another 2-week workshop on Infection Control;** both organized by trainers appointed by the Board for this purpose.

The **Workshop on Antibiotics** gives trainees a basic understanding and knowledge of antibiotics including their classification, mode of action, spectrum of activity and pharmacokinetic and pharmaco-dynamic properties. The principles of antimicrobial therapy are discussed to enable them to advise their clinical colleagues on rational antibiotic therapy in clinical practice. They present a seminar on the use of antibiotic prophylaxis and on combination of antibiotics. They get theoretical input on pharmaco-dynamics and kinetics of antimicrobial dose adjustment and hands-on practical training in antibiotic sensitivity testing including interpretive reporting, quality control and become aware of the limitations of ABST testing. They learn the genetic basis of antibiotic resistance in bacteria and have practical training in testing for difficult to detect resistance mechanisms in the laboratory. They access information about newer antibiotics (which have been developed for treatment of antibiotic resistant pathogens) and information on emerging mechanisms of resistance in a variety of pathogens. Antibiotic stewardship including the development of antibiotic policies and guidelines and resistance surveillance are discussed. They visit the antibiotic assay laboratory at the MRI and learn about dose adjustment of antibiotics based on serum levels.

The **Workshop on Infection Control** aims to make trainees aware of hospital infection control activities, and how these are carried out in Sri Lanka. The workshop includes some lectures on hospital sterilization procedures (including new developments in sterilization and disinfection), waste disposal, safety precautions in blood transfusion and outbreak management, including the epidemiology of hospital outbreaks and molecular techniques for outbreak investigation. Special emphasis is laid on problem areas like operating theatres, intensive care units, premature baby units, endoscopy units, dental clinics and blood banks. During the workshop, trainees are given the opportunity to visit these sites under supervision, and to report on their observations. At the end of the workshop, trainees are expected to present their reports and discuss their findings with a panel of trainers.

On the basis that 15 hours of face-to-face learning is equivalent to one credit, each workshop shall carry 2 credits; and together the two training workshops shall carry 4 credits.

C. Special appointments

After completion of the training workshops, trainees will have special appointments in reference laboratories and units that are relevant to clinical microbiology. These rotations are as follows:

Appointment	Duration	Credits
Virology (in MRI Virology labs)	4 weeks	2
Mycology (at MRI Mycology lab)	2 weeks	1
Immunology (at MRI Immunology lab)	2 weeks	1
Food & Water Bacteriology (at MRI labs)	2 weeks	1
Respiratory infections and TB (at central TB lab and FoM UoC)	2 weeks	1
Infectious disease epidemiology (at Epid Unit)	2 weeks	1
Sexually transmitted infections (at central STD/AIDS lab)	2 weeks	1
Total	**16 weeks**	**8**

The learning objectives for these special appointments are set out in **Annex 1.**
All trainees in a given year shall be sent for these appointments in one or two groups.
*On the basis that 60 hours of such training is equivalent to one credit, with 16 weeks of training, this amounts to a total of **8 credits.***

D. Research project leading to a Dissertation

A research project approved by the Board of Study must be carried out by each trainee during the period of in-service training, under a designated supervisor. The objective of this training component is to enable trainees to gain experience in planning, carrying out and presenting a research study. The findings are expected to contribute to existing knowledge regarding infectious diseases in Sri Lanka. The study proposal and dissertation should therefore show evidence of originality and / or discovery of new facts in the area under study, as judged by independent, critical assessment.

The project proposal is expected to enable trainees to show their ability to:

- Clearly define a topic for study
- Define the questions to be asked and investigated
- Put the research question into context nationally and internationally, and
- Apply appropriate research methods

The dissertation is expected to enable trainees to show their ability to

- Write clearly and succinctly
- Find and summarise relevant published literature
- Gather and analyse primary data from microbiology laboratory-based investigations
- Present findings in an orderly and coherent fashion
- Discuss, clearly and coherently, the significance of the findings as applied to the national and international contexts
- Justify conclusions in terms of findings
- Provide a properly cited, complete and orderly bibliography

Guidelines for supervisors are provided in **Annex 2**. The research project may be carried out in a sub-speciality of the student's choice.
Trainees are expected to submit the Supervisor's Consent Form (**Annex 3**) to the Board of Study, **by the end of the 4th month of the training period**, for Board approval of the title of the study and the designated supervisor.
Trainees are expected to participate in a workshop on research methodology and scientific writing during the first year of training.
After obtaining approval for the title of the project, trainees are expected to formulate a complete research proposal **(Annex 4)** and submit it for Board approval **by the end of the 7th month of the training programme**. Trainees are also expected to make 10-minute presentations of their project proposals at a seminar, in order to obtain feedback from other trainers prior to commencing lab work on the project.
Trainees are expected to engage in sample collection, benchwork, data analysis and writing up of the dissertation during the 4½-month period extending from the 12th to the 16th months of training. Supervisors are expected to submit a progress report at the end of this 4 month period (**Annex 5**).
In 4th month of the 3rd year, trainees are expected to make another presentation on their findings, in order to obtain feedback from other trainers. Trainees must submit their dissertations, written according to the guidelines set out in **Annex 6**, **before the end of the 5th month in the 3rd year of training**. Trainees must submit the completed dissertation by this deadline in order to be eligible to sit for the MD examination.

*This training component (Research Project) shall carry **10 credits**.*

E. Tutorials in Clinical Parasitology

During the hospital appointments in the **2nd year, 9 one-day** tutorial sessions will be conducted on a monthly basis (for all trainees together) to revise and update their knowledge and diagnostic skills regarding clinical presentations, laboratory diagnosis, drug treatment and management of the most important parasitic infections in Sri Lanka at present. These infections are listed below. Each day will be dedicated to one topic, with 2 days for malaria. The tutorials will be conducted in a Parasitology Dept in a Medical Faculty or the MRI, that has specialists with expertise in that particular subject area.

- Malaria (2 days)
- Leishmaniasis
- Toxoplasmosis
- Intestinal protozoan infections, especially cryptosporidiosis, amoebiasis and giardiasis
- Trichomoniasis and scabies
- Pneumocystosis
- Intestinal helminthiases
- Filarial infections – lymphatic and tissue

The sessions are structured as follows.

1. Clinical presentations of the infection(s).
2. Laboratory techniques available for confirmation of clinical diagnosis
   a. Discussion of available options
   b. Revision of bench skills acquired during Diploma training with regard to microscopy and recognition of parasites
3. Drug treatment and management of patients

Parts 1) and 3) could take the form of joint discussions with clinicians or pharmacologists using paper-based case scenarios.
On the basis that 15 hours of face-to-face learning is equivalent to one credit, this training component shall carry 1 credit.

F. Tutorials in Medical Microbiology and writing skills

During the **9 months of hospital appointments in the 3rd year,** trainees will be expected to attend tutorials on a fortnightly basis, conducted at the PGIM or the MRI. The tutorials are intended to cover special topics in Medical Microbiology and also help to strengthen the trainees' writing skills. Topics to be included during these classes include:

1. Professional ethics and communication skills (1 day)
2. Laboratory management (1/2 a day session)
3. Management of infections in different systems
4. Technical and medical evaluation of a laboratory report
5. Laboratory quality assurance and accreditation of medical laboratories
6. Laboratory based software/information system
7. Epidemiology and public health and the use of relevant software
8. Clinical audits
9. Medical statistics
10. Infectious agents of global public health importance
11. Microbiological aspects of disaster management

In addition to discussion of these topics, trainees may also discuss other topics of interest with the tutors and strengthen their skills in essay writing.

*On the basis that 15 hours of face-to-face teaching is equivalent to one credit, with 18 days of classes, this amounts to **6 credits**.*

7. IDENTIFICATION OF TRAINERS, THEIR ROLES AND RESPONSIBILITIES

Trainers recognized by the Board of Study for the MD in Microbiology have at least three years experience after Board Certification in the field of Medical Microbiology, Medical Parasitology, Medical Virology, Medical Mycology, Immunology or Molecular Biology, or at least five years experience after obtaining a Doctoral degree.
The roles and responsibilities of a trainer are identified in **Annex 7**.
The current list of trainers is shown in **Annex 8**.

8. FORMAT OF ASSESSMENTS

Assessment of trainees includes in-course assessment, assessment of the dissertation, and end-of-course final examinations.

A. In-course assessment

Trainers are required to send progress reports to the PGIM on the trainees at the end of each hospital rotation **(Annex 9).** Trainees are also expected to submit 3 sets of Peer Team Ratings as per standard PGIM requirements.
Persistently unsatisfactory reports may result in candidates being discontinued from the training programme following an inquiry.
Formative in-course assessment also includes a portfolio compiled as stipulated by the Board of Study **(Annex 10).** This portfolio must be submitted to the PGIM at the end of the MD training period, as a pre-requisite to sit for the final examination. The portfolio shall be marked by 2 examiners using the marking scheme indicated in **Annex 11**, and trainees will be questioned on the portfolio by these examiners, during the viva voce examination. The final

mark awarded for the portfolio after the oral examination put of 225 marks, shall contribute towards 10% of the final end-of-course assessment marks.

B. Assessment of the dissertation

The report on the research project must be submitted in the form of a dissertation at least four months before the MD examination. The dissertation must conform to the format given in the guidelines to MD trainees **(Annex 6).**

All dissertations will be assessed by one local examiner and the foreign examiner, using a standard format **(Annex 12).** The trainee will be questioned on the dissertation at the viva voce examination in the final end-of-course assessment. The marks awarded by the 2 assessors of the dissertation after completion of the viva voce examination out of 100 marks, shall contribute towards 10% of the final end-of-course assessment mark.

C. Eligibility to sit for end-of-course assessment - MD Microbiology

In order to be eligible to sit for the final examination, trainees must

1) Show at least 80% attendance and satisfactory completion in each of the following training components
    a. Hospital Microbiology Laboratory appointments
    b. Infection Control training workshop
    c. Antibiotic training workshop
    d. Each special appointment
    e. Completion of Research project and submission of the dissertation before a stipulated date
    f. Tutorials in Clinical Parasitology and Medical Microbiology
2) Obtain a satisfactory progress report from each hospital laboratory trainer
3) Submit 3 sets of Peer Team Rating forms
4) Submit a duly completed portfolio
5) Submit the dissertation

D. End-of-course assessment – MD Medical Microbiology

A final examination will be conducted at the end of the training period of 33 months.
The examination shall have three parts, with six components, as set out below:

Part 1- Theory part with two components: written paper I and Paper II
Part 2 - Practical part with two components: laboratory examination 1 and 2
Part 3 - Oral examination part with two components: portfolio and dissertation

C1. Paper I will have 5 essay type questions to be answered in 3 hours. The number of questions from each sub-specialty will be as follows:

Sub-specialty	**No of questions**	**Marks**
Bacteriology	2	200
General and systematic Virology	1	100
Mycology	1	100
Immunology	1	100
Total	**5**	**500**

C2. Paper II will have 15 Short Essay Questions or/and Modified Essay Questions to be answered in 3 hours. The number of questions from each sub-specialty will be as follows:

Sub-specialty	No of questions	Marks
Bacteriology	8	160
General and systematic Virology	3	60
Mycology	2	40
Immunology	1	20
Parasitology	1	20

Each answer will be marked independently by two examiners, out of a total of 20 marks.

C3. Laboratory examination I will be conducted over the course of 20 hours extending over 3 days. During this period, candidates will be required to process 3 specimens for bacteriological investigation, 1 for virological investigation (3-5 hours) and 1 for mycological investigation (3 hours). Candidates' skills in laboratory procedures will be assessed by the examiners together with knowledge of infection control, handling of referrals, clinical liaison and investigation of outbreaks with regard to these specimens. Immunology may be combined with any of the specimens/questions. Allocation of marks shall be as follows:

Sub-speciality	No of specimens	Marks
Bacteriology	3	300
Virology	1	100
Mycology	1	100
Total	**5**	**500**

C4. Laboratory examination II will consist of 20 spots to be identified in 60 minutes. The number of questions from each sub-specialty will be as follows:

Sub-specialty	No of questions	Marks
Clinical Microbiology	9	45
Virology	4	20
Mycology	3	15
Immunology	2	10
Parasitology	2	10
Total	**20**	**100**

Each answer is marked by 2 examiners out of total of 5 marks, to derive a final mark out of 100.

C5. Oral examination on the Dissertation. The candidate shall be questioned on the dissertation by two examiners for 30 minutes

C6. Oral examination on the portfolio. The candidate shall be questioned on the portfolio by the two examiners for 30 minutes.
The final computation of marks shall be as follows:

Examination component	Marked out of	Percentage of final mark
C1. Written paper I	500	20%
C2. Written paper II	300	20%
C3. Laboratory examination I	500	35%
C4. Laboratory examination 11	100	5%
C5. Dissertation	100	10%
C6. Portfolio	225	10%
Total	**1725**	**100%**

E. Requirements to pass the MD Medical Microbiology Examination

To pass the MD in Medical Microbiology Examination, a candidate will be required to obtain the following:

A total average of a minimum of **60%** or more for the entire examination (C1 to C6)

AND

Obtain a minimum of 50% or more for the practical part of the examination (Component 3 and 4 - Laboratory examinations I and II)

AND

Obtain a minimum of 50% or more for the theory part of the examination (Component 1 and 2 - written papers I and II)

F. Repeat attempts

A candidate who has obtained a total average of at least **60%** for the examination, and has also obtained at least **50%** in the practical part, or **50%** in the theory part, but has failed the examination because he / she has not obtained the requisite minimum percentage either for the practical part (Component 3 and 4) or theory part (Component 1 and 2), shall be permitted to sit for that part alone. In such a case, the total mark for the repeat examination shall be calculated using the marks from the passed part of the previous examination, the oral examination of the dissertation and oral examination of the portfolio, along with marks from the repeated part. A candidate shall be given this concession for only one repeat examination. In the event that a candidate does not pass the repeat examination, he / she shall have to sit for the entire examination again on the next occasion.

A candidate must complete the MD within 6 attempts (including those attempts in which the candidate took only one part of the examination) in not more than **8** years from the first attempt at the MD examination, unless the Senate of the University of Colombo has permitted extension for valid reasons.

9. DETAILS OF POST MD TRAINING

This will consist of 12 months of training locally as a Senior Registrar, and 12 months of training at a recognized centre overseas, approved by the PGIM. The 12 months of local training can be done en bloc or in 2 parts before or after the period of overseas training. The objectives for local post-MD training are set out in Annex 13 and those for overseas post-MD training are set out in Annex 14.

During the post MD training period, progress reports will have to be submitted as specified by the PGIM with reports based on the format shown in Annex 15. Certification of satisfactory completion of local and overseas training should be forwarded to the Director, PGIM by the respective supervisors.

10. DETAILS OF PRE-BOARD CERTIFICATION ASSESSMENT

(a) Upon completion of the prescribed period of post-MD training, the trainee should apply to the PGIM for Board Certification in Medical Microbiology, together with the completed portfolio with documentary evidence of the work undertaken by him / her during the period of overseas training.

The portfolio will be assessed during a 30 minute oral examination and the performance of the trainee will be marked by a panel of examiners using the following rating scale:

- Excellent
- Good
- Pass
- Borderline
- Fail

A trainee must obtain a minimum of 'Pass' to be eligible for Board Certification. A trainee whose portfolio is rated as 'Borderline failure' or 'Bad failure' will be advised by the panel of examiners on how the portfolio could be improved to achieve a 'Pass'. In such a case, the necessary corrections and amendments have to be made by the trainee and the portfolio submitted to the same panel of examiners for a second evaluation. If a 'pass' is not obtained, a third evaluation by the same panel of examiners will become necessary.

The completed portfolio, its satisfactory assessment by the Board of Study and a minimum pass grading at the pre-Board Certification assessment is necessary for the trainee to be considered eligible for recommendation for Board Certification.

(b) The trainee will also be required to make an oral presentation to the Board of Study regarding his / her post-MD training, and face a viva voce examination of at least 30 minutes duration. This should be accepted and approved by the BOS

11. DETAILS OF BOARD CERTIFICATION

A trainee who has fulfilled the following criteria shall be deemed to be eligible for Board Certification:

(a) Passed the MD Examination
(b) Completed one year local and one year overseas training in units approved by the Board of Study.
(c) Submitted satisfactory progress reports from the local supervisor appointed by the Board of Study
(d) Submitted satisfactory progress reports from the overseas supervisor appointed by the Board of Study
(e) Passed the pre-Board Certification assessment conducted by the Board of Study, which comprises of a presentation by the trainee and an assessment of the trainee's portfolio, covering work carried out during the post-MD training period.

12. RECOMMENDED READING

- Principles and Practice of infectious diseases; Mandell, Douglas and Bennett's; Gerald J Mandell, John E Bennett, Raphael Dolin; latest edition
- Antibiotic and chemotherapy by Finch, Greenwood et al
- Control of hospital Infections- A practical Handbook- Edited by G A Jayliffe, A P Fraise, A. M. Geddes, K. Mitchell; 4th edition
- Manual of Clinical microbiology- Patrick R Murray, Ellen J O Baron, James H Jorgensen, Michael A, P Faller and Robert H Yolken- 8th edition- ASM Press
- Identification of pathogenic fungi; C K Campbell, E M Johnson, C m Philpot, D w warnock; Public Health Laboratory Service in uK
- Microbiology and Microbial infections- Topley & Wilson's
- Medical Microbiology by Greenwood, Slack and Peutherer
- Practical Medical Microbiology by JG Collee, AG Fraser, BP Marmion and A Simmons
- Cowan and Steel's Manual for identification of medical bacteria
- Baily and Scott's Diagnostic Microbiology by Ellen JO Baron, Lance R Peterson, Sydney M Finegold.
- Basic Clinical Parasitology by Franklin A Neva and Harold W Brown. 6th Edition. Prentice Hall International Inc.
- A Colour Atlas of Tropical Medicine and Parasitology by Peters and Gilles.
- Janeways's Immunobiology; 8th edition
- Infectious diseases by Barbara A Banister, Norman T. Begg, Stephen H. Gillespie.
- Medical Microbiology Cedric A. Mims, John HL Playfair,Ivan M. Roitt,D.Wakelin, R.Williams.
- Microbiology & Infections T.J.J Inglis

ANNEX 1
LEARNING OBJECTIVES FOR SPECIAL APPOINTMENTS

Virology

The trainee will be able to

1. describe the aetiology, pathogenesis and epidemiology of viral infections
2. Identify relevant laboratory investigations for the diagnosis of common viral infections and instruct on collection, storage and transportation of appropriate specimens.
3. Identify facilities available in the state sector and private sector laboratories for diagnosis of viral infections.
4. Demonstrate technical skills to perform routine diagnostic tests carried out in a teaching hospital laboratory, as well as interpret and report on test results.
5. carry out surveillance activities regarding viral infections
6. Plan and execute infection control activities including management of outbreaks of viral infections.
7. Advice clinicians in diagnosis and treatment of viral infections.
8. Advice on accidental exposures of health care workers to blood and blood stained body fluids.
9. Discuss laboratory safety measures in handling virology specimens

Immunology

The trainee will be able to

1. instruct on collection and transportation of samples for diagnosis of immunological conditions
2. Advice clinicians on the investigation and management of patients with immunological conditions, including hypersensitivity and immunological disorders
3. Describe investigations available in Sri Lanka (including flow cytometry), and discuss their limitations for diagnosing immunological conditions.
4. Process samples sent for routine immunological investigations in a clinical diagnostic laboratory
5. Explain the basis of use of immunomodulators, including vaccines and monoclonal antibodies.
6. explain the immunological basis of sepsis

Food and water bacteriology

The trainee will be able to

1. describe the aetiology, pathogenesis and epidemiology of bacterial, viral and protozoan infections transmitted through food and / or water
2. advise on prevention of transmission of disease through food and water in routine public health as well as in mass disasters
3. investigate food and waterborne enteric disease outbreaks
4. Discuss the role of the medical microbiologist in preventing food or waterborne disease in mass disasters and in public health
5. Advise on collection, and process samples of water and food to assess microbial quality and report on results
6. Advise on basic water treatment methods such as chlorination etc
7. Discuss relevant sections of the Food Act

Respiratory infections and TB

The trainee will be able to

1. describe the aetiology, pathogenesis, epidemiology and prevention of tuberculosis and other mycobacterial infections
2. identify relevant laboratory investigations for the diagnosis of tuberculosis and mycobacterial infections
3. instruct on collection and transportation of appropriate specimens for microbiological diagnosis of tuberculosis and mycobacterial infections
4. Process specimens for the microbiological investigation of tuberculosis and mycobacterial infections using microscopy and culture.
5. report on microscopic examination of sputum specimens received for examination for acid fast bacilli
6. Report on culture results of specimens received from patients suspected as having tuberculosis and mycobacterial infections.
7. Describe the species identification and antibiotic sensitivity testing of mycobacterial species carried out in the reference laboratory
8. Describe the rapid diagnostic methods and molecular methods available for diagnosis of tuberculosis
9. Liaise with the reference laboratory regarding further investigation of isolates from clinical specimens. eg species identification and antibiotic sensitivity testing.
10. Describe the establishment and management of a mycobacteriology laboratory.
11. Advice clinicians regarding notification procedures and infection control activities related to tuberculosis in hospital and community settings.

Sexually transmitted infections (STIs)

The trainee will be able to

1. describe the aetiology, pathogenesis, epidemiology and prevention of STIs
2. identify relevant laboratory investigations for the diagnosis of STIs
3. instruct on collection and transportation of appropriate specimens for microbiological diagnosis of STIs
4. Process specimens for the microbiological investigation of STIs in the laboratory.
5. report on STI-causing microbial pathogens in clinical samples and their antimicrobial susceptibility
6. Advise clinicians on antimicrobial and microbiological management of patients with STIs, including retroviral therapy.
7. Manage the microbiological laboratory services and the work environment of a STI microbiology laboratory.
8. oversee infection control activities related to STIs and advise on infection control procedures

Epidemiology unit and Port Health Authority (one day)

The trainee will be able to

- Describe the functions of the Epidemiology Unit of the Ministry of Health in Sri Lanka and its composition
- List the current notifiable diseases in Sri Lanka, and describe the process that follows notification of such diseases
- Describe the investigation of a community outbreak
- Discuss the EPI programme, its targets and achievements
- Discuss the purpose of the National Immunization Summit
- Discuss the epidemiology of emerging infectious diseases

- Discuss surveillance and recommended preventive measures for dengue, influenza, leptospirosis and any other illness of current importance
- Describe national and international sources of epidemiological data on infectious diseases.
- Describe the functions of the Port Health Authority in relation to prevention of international transmission of infections

Mycology

The trainee will be able to

- describe the aetiology, pathogenesis and epidemiology of fungal infections
- identify relevant laboratory investigations for the diagnosis of common fungal infections
- instruct on collection, storage and transportation of appropriate specimens.
- identify facilities available in the state sector and private sector laboratories for diagnosis of fungal infections.
- demonstrate technical skills to perform routine diagnostic tests carried out in a teaching hospital laboratory, interpret and report on test results, including antifungal sensitivity tests.
- Advice clinicians on management of patients with fungal infections
- Discuss laboratory safety measures in handling mycology specimens

ANNEX 2 Micro / 99/ 2.2 (updated Dec 2010)

DISSERTATION FOR MD MEDICAL MICROBIOLOGY
INFORMATION & GUIDELINES TO SUPERVISORS

- The dissertation for the MD Microbiology is based on a 3-4 month research project.
- Acceptance of the dissertation is a requirement to sit the MD examination
- The trainee should write up the project work as a dissertation conforming to the format approved by the Board of Study in Microbiology.
- The supervisor should guide the student in planning, carrying out research methodology and in presentation of the work.
- The supervisor should obtain recommendation of the research proposal from a reviewer.
- The supervisor should forward Progress Report(s) in the prescribed form at the end of 3 months after the trainee commences work on the research project and 3 months after completing the project work.
- The objective of the dissertation is to prove the trainee's capability to plan, carry out and present his / her own research. The purpose of this training is to ensure maturity, discipline and scholarship in research.
- The dissertation should comprise the trainee's own account of his / her research.
- It must contribute to existing knowledge of infective diseases relevant to Sri Lanka and afford evidence of originality as shown by independent, critical assessment and / or discovery of new facts in the area under study.
- It should be satisfactory as regards literary presentation.
- The dissertation should be certified by the supervisor as suitable for submission.
- General Comments on the contents: The objectives should be clearly stated and should be feasible to achieve within the time frame. Other published work relevant to the problem (both international and local) should be comprehensively covered and critically evaluated. The research methodology should achieve the objectives stated. The results should be presented effectively. The discussion should include comments on the significance of results, how they agree or differ from published work and theoretical / practical applications of the results, if any. The conclusions should be valid and be based on the results obtained on the study.
- Ethics: The candidate should confirm and document that procedures followed were approved by the Ethical Committee of the institution where the work was carried out and ethical approval is obtained by a recognized Ethical Committee.
- The trainee is required to make a short presentation (10 min.) of the project proposal prior to commencement of the project in September of their year 1 training to obtain a feedback from other trainers and invitees, regarding feasibility, methodology and statistical considerations.
- The trainee will be required to make a short presentation (15 – 20 minutes) of the project once completed to the BOS members and other invitees prior to submission. This will give the trainee an opportunity to discuss his / her work and to get feedback from peers and colleagues. It will not be used for evaluation in any form. The supervisors are also invited for these presentations.
- The candidate will be questioned on the dissertation at the viva-voce examination.
- If at any time the supervisor is not satisfied with the work progress of the trainee, the trainee should be made aware of the deficiencies and corrective measures suggested. This should be conveyed in writing to the trainee with a copy to the BOS. In such instances, a follow-up report should be forwarded within three months or earlier if necessary to the BOS.

ANNEX 3 **Micro/99/2.3**

POSTGRADUATE INSTITUTE OF MEDICINE- BOARD OF STUDY IN MICROBIOLOGY

SUPERVISOR CONSENT FORM

1. **Name of Trainee:**

2. **Training Centre:**

3. **Supervisor:**

4. **Title of Project:**

ANNEX 4 **Micro / 99/ 2.4 (updated Dec 2010)**

POSTGRADUATE INSTITUTE OF MEDICINE- BOARD OF STUDY IN MICROBIOLOGY

RESEARCH PROPOSAL FOR MD DISSERTATION

1. Name of Trainee:

2. Training Centre:

3. Supervisor:

---

4. Reviewer:

Name

Designation Address Official /Private

Tel//Fax

---

5. Title of Project:

---

6. Brief description of project* (*see footnotes*):

6.1 Background and justification

6.2 Objectives

6.3 Research Plan

7. Institution(s) where work would be carried out:

8. Ethical considerations/institution from where ethical approval will be /has been obtained:

---

9. Recommendation of supervisor:

Signature date

---

10. Recommendation of reviewer:

I certify that it is feasible to complete this project within a period of three months, the methodology is scientifically valid and ethically acceptable.

Signature date

---

11. Students signature date

---

12. Recommendation of the MD Course Coordinator

Signature date

---

13. Recommendation of the BOS:

***Notes**

6.1 Brief technical description of subject, rationale of proposed research, brief literature review with explicit reference to earlier or ongoing work (approx. 300 words)

6.2 Should give concise statements of what you propose to achieve

6.3 ***Hypothesis to be tested. Methodologies and activities to be carried out; outline of work plan indicating time frame.***

ANNEX 5

POSTGRADUATE INSTITUTE OF MEDICINE
BOARD OF STUDY IN MICROBIOLOGY

MD DISSERTATION PROGRESS REPORT

To be forwarded by the supervisor to the BoS through the Course Co-ordinators 3 months after completing the period of assignment for project work

1. **Name of trainee**

2. **Training Centre**

3. **Supervisor**

4. **Title of project**

5. **Description of work carried out to date**

To be filled in by trainee: briefly describe progress in lab / field work and dissertation writing

---

Supervisor's comments

6. **Is the work on schedule**? Yes / No

7. **Progress in dissertation writing**: satisfactory / unsatisfactory

8. **Constraints** (if any)

9. **Recommendation of supervisor**:

Signature Date

---

10. Recommendation of MD Co-ordinator

Signature Date

11. Date of BoS approval

ANNEX 6
MD DISSERTATION GUIDELINES

General instructions
It is essential to start writing the dissertation early and in all cases before the experiments / field work is finished. At the same time, you should make arrangements to have your manuscript word-processed. Your supervisor should be consulted before you start to write and thereafter at regular intervals. It is much easier to make corrections if the draft is double-spaced and printed on only one side of the paper.
The past tense should be used as far as possible. To avoid much exceeding the given word limit, it is suggested that an approximate running total is kept. The metric system and the International System (SI) of units should be used whenever possible.

Length
An ideal length of text is approximately 10 000 words, which equals to about 40 pages. With figures, references, etc., the total length is likely to be in the region of 50 - 80 pages.

Number of copies
Three copies should be submitted to the Director/ PGIM, spiral-bound in the first instance. One will be retained in the PGIM, one will be sent to the internal examiner and one to the overseas examiner. After acceptance (and necessary corrections), all three copies should be bound in hard covers (black) with the author's name, degree and year printed in gold on the spine. The front cover should carry the title, author's name and year printed in gold. One copy will be returned to the student, one retained by the supervisor, and the third housed in the PGIM library.

Layout
The dissertation should be word-processed and printed single-side only, on A4-size photocopying paper.

Layout of typescript
There should be 1.5" on left-hand and top margins, and 1.0" on right-hand and bottom margins. It is especially important that the left-hand (binding) margin is of the regulatory size.
Line spacing should not be less than 1.5.
Lettering should be in Times New Roman, font size 12.
All pages should be numbered consecutively throughout, including appendices. Page numbers should be inserted in the bottom right hand corner.

Tables, diagrams, maps and figures
Wherever possible, these should be placed near the appropriate text. Tables should be numbered in continuous sequence throughout the dissertation. Maps, graphs, photographs, etc., should be referred to as Figures. Each of these should also be numbered in a continuous sequence. Colour should be avoided in graphic illustrations (unless it is essential) because of the difficulty of photographic reproduction; symbols or other alternatives should be used instead.

Notes
Notes, if essential, should be inserted, in reduced font, at the foot of the relevant page. If too voluminous for this to be practicable, they should be placed in an Appendix. Notes may be typed in single spacing.

Abbreviations
Where abbreviations are used, a key should be provided.

Preliminaries
The preliminaries precede the text. They should comprise the following:

1. Title page

<Title of dissertation>
<Author's name>
MD (Medical Microbiology)
Post Graduate Institute of Medicine
University of Colombo
<Year of submission>

2. Statement of originality: This is a declaration that the work presented in the dissertation is the candidate's own, and that no part of the dissertation has been submitted earlier or concurrently for any other degree. The statement should be signed by the author, and countersigned by the supervisor.

3. Abstract: This should consist of a brief summary of not more than 350 words describing the objectives of the work, the materials and methods used, the results obtained, and the conclusions drawn. This may be in a structured format if helpful.

4. Table of contents: The table of contents immediately follows the abstract and lists in sequence, with page numbers, all relevant divisions of the dissertation, including the preliminary pages.

5. List of tables: This lists the tables in the order in which they occur in the text, with the page numbers.

6. List of figures: This lists all illustrative material (maps, figures, graphs, photographs etc) in the order in which they occur in the text, with the page numbers.

7. Acknowledgments

Text
The dissertation should be divided into clearly defined chapters. Chapters may be subdivided and a decimal number system can be helpful to identify sections and subsections. You should avoid mixing the topics of the chapters, e.g. no results should appear in the Materials and Methods.

Chapter 1 – Introduction: The aim of this section is to state briefly the current position and the reasons for carrying out the present work. Generally, only a few references should be cited here.

Chapter 2 – Literature Review: This section should be reasonably comprehensive, and most of the references to be quoted normally occur here. The relevant references dealing with the general problems should be reviewed first and this is followed by a detailed review of the specific problem. The review is in many cases approached as a historical record of the development of knowledge of the subject. This chapter should conclude with a brief statement of what you propose to find out.

Chapter 3 – Materials and Methods: These should be described so that a reader could repeat all the experiments. Where specific details are available in the literature, reference should be made to the original papers, and comments kept to a minimum. If modifications have been made to the published techniques, these should be described in full.

Chapter 4 – Results: Much of the data should be given in tables and figures and these should be inserted in the text at the appropriate place. The results must be fully described in the text. It is not sufficient to merely present the tables and figures without any comment. The tables and figures should be clear without references to the text, and this requires concise explanations in legends. Where possible, data presented in the text should have already been analyzed and the complete 'raw' figures should not be included in this section but should be contained in tables in the Appendix.
Only data from the present work should be included in this section and in particular no comparison should be made at this stage with results from other workers.

Chapter 5 – Discussion: The discussion is the most difficult part of the dissertation to write because the author has to compare **critically** the present results with those of other workers and to draw valid conclusions from these studies. Descriptions of other workers findings which already appear in the Literature Review should not be repeated in the Discussion. Instead, refer to the Review.
The limitations of the study and recommendations for future research on the subject should also be included in this chapter.
As your project proceeds, keep notes of your thoughts and discussions relevant to this section.

References
These are given so that the reader can refer to the original papers for further study. Uniformity is essential, but errors and inconsistencies are very common and authors are advised to check the references most carefully. Examiners will mark students down for inconsistencies in their references, either omissions or failure to follow the recommended format as given in the following section.
References are very important and must be complete and accurate. All literature referred to should be listed in a consistent form and style, and must contain sufficient information to enable the reader to identify and retrieve them.
There are different styles of citing sources, listing references and compiling a bibliography. The Harvard style (author, date) is widely accepted in scholarly and scientific writings, and is recommended for students on the MD (Medical Microbiology) course.

The Harvard style
The Harvard style is often known as the 'author-date' system. Generally, when using the Harvard system, a citation in your paper requires only the surname of the author (or authors) and the year of publication. If there are only two authors give both names; for more than two

authors use *et al*. Citations should, whenever possible, be placed at the end of a sentence (before the concluding punctuation). For example:
There is consistent urban bias in the provision of health services (Sawyer, 1999).
Alternatively, the author's surname may be integrated into the text, followed immediately by the year of publication in parentheses.

Sawyer (1999) observes that .....

If there is more than one reference by the same author(s), the references should be listed chronologically in order of year of publication. If there is more than one reference by an author in the same year, label with lower case letter, 'a' before 'b', 'c', etc.

Other researchers (Tang 1998a; Cleg, 1999) have highlighted this inadequacy, while Tang (1998b) argues that .....

References cited only in tables or in legends to figures should be in accordance with a sequence established by the first identification in the text of the particular table or illustration.
The arrangement of the references at the end of the dissertation should be alphabetical.
The order of the items in each reference should be:

(a) for journal references: name(s) of author(s), year, title of paper, title of journal, volume number, page numbers.
(b) for book references: name(s) of author(s), year, title of book, edition, volume, chapter and/or page number, town of publication, publisher.

Authors' names should be in roman letters, and arranged thus:

Smith, C.O., James, D.E. & Frank, J.D.

Note the use of the ampersand (&) and omission of comma before it. Where an author's name is repeated in the next reference it should also be spelt out in full.
The year of publication should be surrounded by parenthesis like this: (1999)
The title of the paper is then included, without quotation marks: e.g., Child health promotion in developing countries.
The journal title should be unabbreviated, underlined, and be followed by volume number in bold, the issue (part) number, and the page numbers (first and last page numbers). It should read like this:

Health Policy and Planning **14**:1; 1-10.

Examples:

Ehiri, J.E. & Prowse, J.M. (1999) Child health promotion in developing countries: the case for integration of environmental interventions? Health Policy and Planning **14**:1; 1-10.

Tuku, A.B. James, D.E. & Okada, F.C. (1999) The response of factor B to factor C. Biochemical Journal **151**:2; 1049-1053.

Harris, G.W. (1955) Neural Control of the Pituitary Gland. London: Arnold.

Sloper, J.C. (1966) The experimental and cyto-pathological investigation of neurosecretion in the hypothalamus and pituitary. In The Pituitary Gland, eds. Harris, G.W. & Donovan, B.T. Vol. 3. Ch.7 London: Butterworth.

Websites
Author's name (if available) must be listed first, followed by the full title of the document in italics (underline if handwritten), the date of publication or last revision (if available), the full http address (URL) enclosed within angle brackets, and the date of visit in parentheses
Example:
Schettler, T., Solomon, G., Burns, P. & Valenti, M. *Generations at risk: how environmental toxins may affect reproductive health in Massachusetts.* <http://www.igc.apc.org/psr/genrisk.html > (24/08/99).

ANNEX 7
ROLES AND RESPONSIBILITIES OF A TRAINER IN MEDICAL MICROBIOLOGY /VIROLOGY /PARASITOLOGY OF THE POSTGRADUATE INSTITUTE OF MEDICINE

The roles and responsibilities of a trainer in Microbiology/Virology and Parasitology are multiple:

A. Diploma / MD trainer
B. Academic Appraiser
C. Supervisor of a research project
D. Reviewer/assessor of a research project
E. Role model
F. Examiner

A. <u>As a Diploma /MD trainer,</u> she/he should

1. Be involved in teaching and ensure trainees learn on the job.
2. Allocate time for trainees to discuss academic as well as personal issues.
3. In instances of unsatisfactory behavior, attitude or problems of the trainee, first warn the trainee and if the situation persists, inform the academic appraiser of the trainee to sort out the problem at grass root level. As a last resort, inform the Director PGIM and Board of Study in microbiology so that remedial action can be taken. Communications on such issues should be copied to the trainee's academic appraiser.
4. Consult the Board of Study and inform the academic appraiser of the trainee, if a trainee is required to repeat any duration of a clinical appointment or any other appointment.
5. Send progress reports to the BoS in Microbiology , once for every clinical appointment in the MD including the 3 month appointments in LRH and CIM and twice for the post MD training programme. In the Virology and Parasitology training programmes, the consultant in charge of the particular segment of training should send a progress report for each trainee.
6. Supervise the leave arrangements of trainees. (Warn the trainees if in excess and remind them that leave is not a right but a privilege, but give their due)
7. Encourage trainees to participate in continuing medical and professional development activities such as time to visit the library, participate in other clinical meetings, workshops, critical appraisal of journal articles etc.
8. Encourage presentations by the trainees in clinical meetings, CPD activities etc.
9. Conduct workplace based assessments – DOPS and CbD as indicated in the portfolio guidelines.
10. Inform the BoS in Microbiology if more than 2 weeks of leave is to be taken by you.
11. arrange for cover up of leave for training purposes (since this may be different from work cover up)
12. Inform the BoS in Microbiology and give adequate time for the trainee to be moved to another training site if more than 1 month leave is to be taken, since off site cover is not acceptable in such a situation.
13. Preferably take trainees, only after you take up your post fulltime and not during acting or visiting posts.
14. As far as possible, try to complete the appointment period of the trainees before reporting for duty in the next post when on transfer orders. If an immediate transfer cannot be avoided, the trainer should inform the BoS in time and get suggestions regarding the ongoing training of any trainees in the station.

15. handover the required letters of release/ attest to the satisfactory completion of training in the log book of the trainees on completion of an appointment by the trainee (it might be difficult for them to come later)
16. Give constructive feedback continuously, which will help the trainees to improve both academically and professionally. Feedback on negative aspects of a trainee should be dealt with in a confidential manner.
17. Make sure that a pregnant trainee does not handle specimens from high risk patients including tuberculosis.
18. Provide a pleasant and disciplined environment in your laboratory for the trainee to work.

B. <u>As an academic appraiser</u>, the trainer should

1. Have regular meetings with the trainees.
2. Be accessible to the trainee and give your contact number and convenient times for meetings.
3. Develop an approachable, friendly relationship so that trainees are not hesitant to contact you in times of need.
4. Supervise the entries and ensure regular updates of your appraisee's portfolio.

C. <u>As a supervisor of a research project</u>, the trainer should

1. Be realistic and ensure the trainee gets hands on experience to do research on his or her own.
2. Not have too many goals which will burden the trainee who will find it difficult to finish the project within 4 months.
3. Make sure that trainees submit duly filled forms and suggest the name of a reviewer to review the project proposal.
4. Assist and advice trainees regarding obtaining funds in time for project commencement.
5. Correct the trainee's presentation and writing (including spelling and grammar) before it is presented or sent to the reviewer or submitted for evaluation.
6. Encourage them to publish or present in national and international scientific sessions.

D. <u>As a reviewer and assessor of a research project dissertation</u>, the trainer should

1. Review the work done in the Sri Lankan context.
2. Write a detailed report including the corrections and changes that a trainee has to attend to.
3. complete the review within the allocated time, otherwise trainees will face difficulties in attending to the corrections
4. Remember that a delay in submission of your assessor report will delay the procedure of sending all the dissertations to the foreign examiner by the PGIM.

E. <u>As a role model</u> the trainer should

1. Be exemplary in your dealings with colleagues of other disciplines and all personnel in the health care team.
2. always be punctual
3. Be sympathetic to the trainees appreciating that they too have problems.
4. Avoid criticizing other trainers and training sites.

F. <u>As an examiner</u> the trainer should

Read and abide by the guidelines of the PGIM document.

ANNEX 8
LIST OF TRAINING CENTERS

1. Faculty of Medicine, University of Ruhuna
2. Faculty of Medical Sciences, University of Sri Jayewardenepura
3. Faculty of Medicine, University of Colombo
4. Faculty of Medicine, University of Kelaniya
5. Medical Research Institute
6. Colombo South Teaching Hospital, Kalubowila
7. National Hospital of Sri Lanka, Colombo
8. Sri Jayewardenepura General Hospital
9. Colombo North Teaching Hospital, Ragama
10. Faculty of Medicine, University of Peradeniya
11. Lady Ridgeway Hospital for Children, Colombo
12. Medical Research Institute
13. STD /AIDS Control Programme, Colombo
14. Ratnapura General Hospital
15. Cancer Institute, Maharagama
16. Chest Hospital, Welisara
17. Kurunegala General Hospital
18. Teaching Hospital, Galle
19. Faculty of Medicine, Kotelawala Defense University
20. National Institute of Health Sciences, Kalutara
21. Badulla General Hospital

ANNEX 9

MD MEDICAL MICROBIOLOGY/ PARASITOLOGY /VIROLOGY
FORMAT FOR PROGRESS REPORT ON TRAINEES

To be sent at end of 3 or 6 month clinical training, to Secretary / PGIM BoS in Microbiology

Name of trainee: ……..

Name of trainer: ……..

Training centre: ……..

Period of report: …… to …….

Please use the following key to rate your trainee's performance during the period in question, with regard to each of the areas listed below

Outstanding	A
Above average	B
Adequate	C
Below expected	D

PRACTICAL SKILLS	**Rating**	**Specific comments**
A. Clinical judgement		
1. Assessment of request forms		
2. Selection of appropriate lab. investigations		
B. Bench skills		
1. Preparation of reagents & media		
2. Hands-on work at the bench		
3. Interpretation of results		
C. Record keeping		
D. Interpersonal skills		
1. Communication & working with others in the lab		
2. Communication & working with persons of other disciplines		
3. Supervising & helping juniors and willingness to serve when required		
4. Following instructions of senior colleagues		
5. Power of expression (oral and written)		
6. Standard of punctuality, ethics, professional attitudes and reliability		
7. Teaching medical students and juniors		

E. Academic skills	Rating	Specific comments
1. Theoretical background and knowledge		
2. Reads widely in medical literature		
3. Participates actively in academic discussions		
4. Thinks independently and rationally		

PROJECTS OR OTHER ACTIVITIES CARRIED OUT DURING THE PERIOD OF TRAINING:

GENERAL COMMENTS

Particular strengths

Particular weaknesses

……. Signature of trainer

…..…… Date

ANNEX 10
FORMAT OF LEARNING PORTFOLIO

POSTGRADUATE INSTITUTE OF MEDICINE
UNIVERSITY OF COLOMBO
SRI LANKA

TRAINING PROGRAMME
IN
MEDICAL MICROBIOLOGY

Learning Portfolio

TRAINING PROGRAMME LEADING TO BOARD CERTIFICATION IN MEDICAL MICROBIOLOGY

Name of trainee :……..

SLMC Registration No :……. Date :…….

MBBS degree on :……

Completed Internship on :……

Employer: **Ministry of Health** ☐ **University** ☐

Private Sector ☐ **Other** ☐

Permanent Address: **……**

……

……

Contact: Telephone: Work ☐ **Home** ☐

Mobile ☐

DATES RELATED TO TRAINING PROGRAMME

	Diploma	MD	Post MD – Local	Post MD Overseas
Date commenced				
Date completed				
Results on				

Dissertation submitted on	
Board Certified on	

MD IN MEDICAL MICROBIOLOGY

	Venue & supervisor	**Dates**	**Leave taken**	***Supervisor's signature and comments**
1st , 6 month clinical appointment				
Antibiotic workshop				
Infection control workshop				
Clinical Virology				
Clinical Mycology				
Respiratory Inf./TB - Chest Hospital Welisara				
Mycobacteriology Dept. of Microbiology Fac. of Med. Col.				

	Venue & supervisor	Dates	Leave taken	*Supervisor's signature and comments
STI/AIDS				
Clinical Immunology				
Food and water Bacteriology				
Research project and dissertation				
2nd , 6 month clinical appointment				
3rd , 6 month clinical appointment				
Clinical appointment at LRH				
Clinical appointment at CIM				

* Signature of supervisor to indicate satisfactory completion of appointment

INTRODUCTION

The purpose of developing a portfolio is to make a trainee reflect on the process of training and professional development as a clinical Microbiologist and to get effective feedback on their progress throughout the MD training programme. It should be composed of a series of documents that record this process.

OBJECTIVES

The portfolio should demonstrate that trainees have

1. Used a wide and appropriate range of learning methods effectively to develop their knowledge, skills and attitudes in Microbiology.
2. Reflected on their own personal and professional practice and development, assessed their future development needs and made plans for continuing professional development.
3. Developed personal and professional strategies appropriate to the constraints and opportunities of their working environment.
4. evaluated their own work with self, peer- and supervisor-based monitoring and evaluation techniques.
5. Designed methods and techniques to improve the practice of diagnostic and clinical Microbiology in hospitals.
6. Provided support to their colleagues, peers and allied staff in providing training in Microbiology
7. performed effectively their support and administrative tasks.
8. Shown a commitment to work with, and learn from colleagues, practiced equal opportunities and continued reflection on professional practice.

CONTENTS OF THE PORTFOLIO:

The following are suggestions regarding the documents that could be included when compiling the portfolio:

1/ An introduction to self; in the 1st person

- Who you are?
- Where do / did you work? (Present and past)
- Current work place - special interests you may have regarding your specialty.

2/ Statement about your mission and vision as a Medical Microbiologist

- Duties and responsibilities as a trainee in Microbiology.
- Your vision of a professional career in Microbiology.

3/ Records of activities and practices that you have undertaken as a MD trainee in Microbiology to achieve the objectives mentioned above

This should include the following:

A. Record of training appointments:

This should include **five reports** (one each for the six-month hospital appointments and one each for CIM and LRH appointments) that document what you hoped to achieve at the beginning of each appointment, and how much of this you had achieved by the end. The reports should include in addition a self-evaluation carried out mid-way during the appointment, that reviews your achievements to date, identifies problems that prevent you from reaching your goals, and what you plan to do to correct these deficiencies.

The reports can also include any or all of the following:

- Descriptions of ward rounds performed during the four clinical appointments, as well as participation in infection control and other relevant hospital committees.

- Description of teaching commitments undertaken by you during your training
- Reports on presentations you have made at journal clubs, lectures, etc, and feedback received from peers or supervisors on such presentations

B. Formative assessments

- ***Case based discussions (CbD) :***
  A minimum of 8, two each for the six month appointments and one each for the 3 month appointments in CIM and LRH. These will demonstrate how you have worked towards *Objective 1* (i.e. used a wide and appropriate range of learning methods to enhance your knowledge of Microbiology, and improved your bench, clinical and management skills). The cases you discuss should deal with diagnostic problems as well as problems relating to infection control, laboratory management etc. The case reports should also demonstrate how you worked towards *Objective 3* (i.e. developed personal and professional strategies appropriate to the constraints and opportunities of your working environment), by describing situations where you encountered problems, the strategies you identified to deal with these problems, and how your improved these strategies with advice from your peers and supervisors. Documents pertaining to CbD should include a description of the clinical case as well as the completing the CbD form. In compiling the documents for each case, you should try to provide answers to the following questions:
    - What was the learning experience?
    - What did I learn from that experience?
    - What more do I have to learn?
    - How can I learn it?
    - Evidence for such learning?

- ***Direct observation of practical skills (DOPS)***
  A minimum of 4 practical skills should be assessed during the hospital appointments. A description of the procedure together with the formative assessment in the structured format should be included in the portfolio.
- **Reflective logs on the antibiotic and infection control workshops**

C. Critical evaluation of a journal article related to the specialty.

A total of three critical evaluations should be done during the 6 month clinical training periods in the hospitals.

Each evaluation should have (1) an introduction, with the authors' name(s), the title of the paper, a brief explanation of the topic, and a brief statement regarding the trainee's evaluation of the work; (2) a summary of the paper, explaining the authors' aims, and the key points regarding the work; (3) a critique of the paper; and (4) a conclusion, which restates the overall opinion, presents recommendations and further explanations, if necessary. References should be included if other sources have been used.

The critique should evaluate the significance of the paper and its' contribution to the field of study, through assessment of the extent to which the authors' aims have been achieved, the extent to which the work adds to current knowledge and its relationship to other work in the field, together with assessment of what is missing or not stated in

the paper. It should also mention the approach used in the methods, the objectiveness of this approach, the validity and reliability of the results, and the analytical framework used to discuss the results. In evaluating a paper, you should also note if a clear statement of the problem or hypothesis has been presented, what claims are made by the authors and if arguments in support of such claims are consistent.

4/ Assessment of the portfolio

The portfolio will be assessed on a structured marking scheme (Annex 11) and will contribute to 10% of the total mark. The candidate will be further examined on the portfolio at the oral examination.

5/ Guidelines for preparing the learning portfolio:

The entries in the portfolio should be *printed* on A4 size paper, with a font size of 12 in Times New Roman (or 11 in Arial) and 1.5 line spacing and should consist of ***40 to 50 pages*** when completed (inclusive of learning contracts, other documents of evidence etc.). The supervisor should review each entry by discussing with the trainee. The final submission should be made one month prior to the commencement of the examination.

ANNEX 11
ASSESSMENT OF THE PORTFOLIO

- Different components of the portfolio may be assessed by the trainer or another trainer appointed by the BOS at 3-6 monthly intervals to ensure completion/achievement of set goals of identified component/s and to take remedial action if any deficiencies are observed.
- The completed portfolio should be submitted after completion of the local training together with the application for the MD Medical Microbiology examination.
- It will be assessed by a panel of two examiners appointed by the BOS. The panel will sit at a formal discussion with the trainee and evaluate the portfolio over a period of 30 minutes. At the 30 minute portfolio *viva* voce the performance of the trainee will be marked by the examiners on the following marking scheme.

MARKING SCHEME FOR ASSESSMENT OF PORTFOLIO

CANDIDATE NAME/INDEX NO. YEAR

Area	**Maximum mark**
Complete with minimum criteria	**5**
Used a wide and appropriate range of learning methods effectively to develop their knowledge, skills and attitudes in Microbiology.	**5**
Reflected on their own personal and professional practice and development, assessed their future development needs and made plans for continuing professional development	**5**
Developed personal and professional strategies appropriate to the constraints and opportunities of their working environment.	**5**
Evaluated their own work with self, peer and supervisor based monitoring and evaluation techniques.	**5**
Designed methods and techniques to improve the practice of diagnostic and clinical Microbiology in hospitals.	**5**
Provided support to colleagues, peers and allied staff in providing training in Microbiology	**5**
Effectively supported the administrative tasks in the training unit.	**5**
Shown a commitment to work with and learn from colleagues, practiced equal opportunities and continued reflection on professional practice.	**5**
Record of training appointment with signatures	**10**
Formative assessments - Case based discussions (CbD) X 8	**80**
Formative assessments - DOPS X 4	**20**
Reflective logs on the antibiotic and infection control workshops	**20**
Critical evaluation of journal articles related to the specialty X 3.	**30**
Commitment to reflective practice	**10**
Presentation, originality , organization	**10**
Total mark	**225**
Mark out of 10	**10**

ANNEX 12
MARKING SCHEME FOR ASSESSMENT OF DISSERTATION

1. The dissertation will be marked using the following scheme:

Component	**mark**
Introduction	5
Literature review	20
Materials & Methods	15
Results	15
Discussion and conclusions	20
Presentation of dissertation	10
Oral presentation and viva voce	15
Total	**100**

CRITERIA FOR ASSESSMENT OF DISSERTATION AND PRESENTATION

Introduction:
- Content and structure of the project has been set out clearly.
- Has identified the problem to be examined clearly.

Literature Review
- Evidence of in depth reading, covering historical and current literature on the topic.
- Inclusion of locally available data
- Presentation of a critical review of relevant literature.

Materials and methods
- The design of the study and the appropriateness of the research methodology.
- The systematic conduct of the study and the accurate collection and recording of
- Data and/or information.
- Use of appropriate statistics

Results
- Clear and coherent presentation of the findings with statistical significance indicated where relevant
- Clear tables and figures with appropriate legends

Discussion and conclusions
- The interpretations of results are appropriate and valid from the work
- Conclusions and recommendation are drawn from the work.
- Critical comments made on the extent and limitations of the study.

Presentation of dissertation
- General syntax and writing style.
- Inclusion of References quoted
- Typography.
- Appropriate use of appendices and completeness of list of abbreviations

2. Two assessors (one local examiner + foreign examiner) should mark the dissertation. Examiners are expected to submit the dissertation marks (except for the viva voce exam component) at least two weeks before the commencement of the final exam.
3. The candidate will be questioned on his / her dissertation during the viva voce examination at the main exam.
4. If the difference in the total mark (out of 100) awarded by the two assessors is more than 10 marks, the assessors are expected to discuss the dissertation and come to an agreed mark at the viva voce examination.
5. Candidates are expected to carry out the changes recommended by the examiners within 3 months of the examination. The local assessor should certify that the corrections have been carried out satisfactorily. Candidates will not be permitted to proceed with their post-MD overseas training until they have submitted the corrected dissertation and the local assessor has certified that the corrections are satisfactory.
6. If a candidate fails in either the written papers or the practical component of the final exam, the candidate will not be required to carry out a fresh research project or re-submit the dissertation. The mark awarded for the dissertation will be the same as for the first attempt.

ANNEX 13 BoS/Microbiology- May 2008

OBJECTIVES FOR LOCAL POST MD TRAINING

LABORATORY EXPOSURE AND CLINICAL EXPERIENCE

The trainee should

- have access to and become conversant with diagnostic tests used in clinical microbiology laboratory in a Provincial/Teaching/General hospital in Sri Lanka
- be able to coordinate with Medical Laboratory Technologist (MLT) on day to day bench procedures and advice on problem areas noted by them and pay special attention to
    - specimen reception and handling
    - blood and sterile body fluids
    - pus, wound swabs and sputum
    - antibiotic sensitivity testing
    - serology
    - preparation of culture media and their quality control
    - decontamination and disposal of laboratory waste
    - record keeping and documentation
- Participate in the generation and checking of reports daily.
- supervise the day to day work of the MLT's
- Interpret clinical information for laboratory staff, and participate in decisions as to which tests should be performed by advising the TO on significant/non significant isolates, choice of antibiotics for ABST and laboratory tests for further identification of significant isolates
- actively seek to speciate and identify pathogens especially isolates of clinical significance
- Notify positive blood cultures and other critical results to appropriate medical staff.
- Visit ICU daily with results of specimens processed from ICU patients.
- Visit wards in response to referrals, positive blood cultures and whenever necessary
- Notify infections requiring phone notification to the Regional Epidemiologist, to ward medical staff, Infection Control Team and other Consultants as appropriate.
- be familiar with the indications for use and accessing of reference laboratory facilities
- Become familiar with and practice laboratory safety measures.
- Have exposure to the quality assurance programmes in the laboratory.

ANTIMICROBIAL USE AND MICROBIOLOGICAL MANAGEMENT OF PATIENTS WITH INFECTIONS

The trainee should

- Gain experience in the use of antibiotics in hospital practice and in giving advice on choice and use of antibiotics in different clinical situations
    - Answer telephone inquiries and visit wards to advice concerning antibiotic treatment, appropriate tests to order, specimen collection and appropriate specimens to submit.
- Be aware of setting up and use of antibiotic policies and practice guidelines
- Gain practical experience in antibiotic sensitivity testing and reporting
- Gain experience in performing and interpreting MIC's and antimicrobial assays and be able to advice on dosage regimes accordingly

INFECTION CONTROL ACTIVITIES OF THE HOSPITAL AND COMMUNITY

The trainee should

- gain experience of local infection control problems including outbreaks of infection and their management
- participate and become familiar with the workings of infection control meetings

- participate in visits to clinical and non clinical areas with ICT members to advice on infection control
- gain some experience on public health microbiology and infection control in the community
- notify MOH of possible hospital associated nosocomial outbreaks

MANAGEMENT PRACTICES

The trainee should

- Attend departmental meetings and meetings in the Ministry of Health when invited to do so.
- Get acquainted with the managerial aspects of staff supervision of work, leave etc.
- familiarize themselves with procedures to order equipment, selection of quotations, purchase of equipment & consumables

CONTINUING PROFESSIONAL AND SCHOLARLY DEVELOPMENT

The Trainee should actively seek to enhance their professional development by

- demonstrating integrity, honesty, compassion and respect for diversity
- applying ethical principles appropriately
- seeking and accepting advice and demonstrating awareness of personal limitations
- meeting deadlines, being punctual and meeting commitments made
- developing good interpersonal skills
- Participating and contributing to postgraduate educational meetings.
- participating in teaching and learning activities of junior doctors, allied staff and MLT's
- conducting clinical audits, presenting such audits and case reports in clinical meetings and publishing in local and international journals
- participate in the development of guidelines for good practice
- Maintaining a portfolio/log book of their learning activities with reflective practice

ANNEX 14 Micro/2002/05

PGIM BOARD OF STUDY IN MICROBIOLOGY
OVERSEAS TRAINING REQUIREMENTS (POST MD)

The overseas training programme should be structured so as to provide the trainee with an overview of clinical microbiology as practiced in the Hospital / training institute. The training period should also be used to augment local training. As Microbiology services in Sri Lanka have resource limitations, the overseas training period should provide exposure to, and wherever possible hands-on experience in the following areas:

1. Laboratory exposure

The trainee should

a) Have access to, and become conversant with diagnostic tests used in a modern clinical microbiology laboratory at a District General Hospital
b) Be familiar with the indications for use and accessing of reference laboratory facilities
c) Become familiar with safety precautions and regulations pertaining to safety standards in a modern hospital based diagnostic setting
d) Have exposure to the quality assurance programme established in the laboratory

2. Data handling and clinical experience

The trainee should

a) Have hands on experience in computer data handling and become aware of available technologies for data broadcasting in relation to clinical and epidemiological use of such technologies
b) Gain experience of liaison with clinical colleagues, both through regular ward visits and by handling telephone queries
c) Participate (where possible) in providing on-call cover
d) Participate in postgraduate educational meetings

3. Infection control in hospital and community

The trainee should

a) Gain experience of local infection control problems including outbreaks of infection and their management
b) Become familiar with the workings of infection control meetings
c) Participate in visits to clinical and non-clinical areas with infection control team member to advice on infection control
d) Gain some experience on public health microbiology and infection control in the community

4. Antimicrobial use and laboratory investigations

The trainee should

a) Gain experience in the use of antibiotics in hospital and general practice, and in giving advice on choice and use of antibiotics in different clinical situations
b) Be aware of the setting up and use of antibiotic policies and practice guidelines
c) Gain practical experience in antibiotic sensitivity testing and reporting
d) Gain experience in performing and interpreting MIC's and antimicrobial assays and be able to advice on dosage regimes accordingly

ANNEX 15

FORMAT FOR POST-MD PROGRESS REPORTS

(To be submitted by Supervisor to Director PGIM at 6 months and 12 months)

1. Name of trainee

2. Name of supervisor

3. Training institution and unit

4. Period covered by progress report: …… (dd/mm/yy) to …… (dd/mm/yy)

5. Description of work carried out by trainee in training institution
    a. Course work
    b. Teaching activities
    c. Research projects
    d. Any other
6. Any work carried out away from main training institution?

7. Meetings / conferences / seminars attended by trainee

8. Any publications / presentations by trainee

9. Interaction with colleagues and other staff

10. Overall progress
    a. General comments
    b. Summary:
    Highly satisfactory / satisfactory / unsatisfactory / very unsatisfactory

Signature of supervisor
Date