

“This prospectus is made under the provisions of the Universities Act, the Postgraduate Institute of Medicine Ordinance, and the General By-Laws No. 1 of 2016 and By-Laws No. 4 of 2016 for Postgraduate Diplomas and Postgraduate Certificates and By-Laws No. 2 of 2016 for Degree of Doctor of Medicine(MD) and Board Certification as a Specialist”

**Copyright © 2015 by Postgraduate Institute of Medicine, University of Colombo, 160 Prof. Nandadasa Kodagoda Mawatha, Colombo 7, Sri Lanka.**

**All rights reserved. This course document is the intellectual property of the Postgraduate Institute of Medicine, University of Colombo. No part of this document may be copied, reproduced or transmitted in any form by any means (electronic, photocopying, recording or otherwise) without the prior written permission of the Postgraduate Institute of Medicine, University of Colombo.**



Drafted and printed by the Board of Study in Pathology  
and the Postgraduate Institute of Medicine,  
University of Colombo, Sri Lanka

UNIVERSITY OF COLOMBO



**POSTGRADUATE INSTITUTE  
OF MEDICINE OF SRI LANKA**

**Regulations and Guidelines  
for  
MD Examination  
and  
Board Certification in  
Histopathology  
Clinical Haematology and  
Chemical Pathology**

**16**

**2008**

**Regulations and Guidelines  
for  
MD Examination  
and  
Board Certification in  
Histopathology  
Clinical Haematology and  
Chemical Pathology  
2008**

**In accordance with the decision of the Board of Study in Pathology, and the approval of the Board of Management of the PGIM, this Prospectus, curriculum and training programme in Pathology became effective from 2008. The abridged version is in the annexed pages. The larger version is available in the Academic Branch when requested.**

Postgraduate Institute of Medicine of Sri Lanka  
University of Colombo, Sri Lanka

## **Postgraduate Training Programme in Pathology leading to MD in Histopathology, Clinical Haematology and Chemical Pathology**

### **1. Overview of the Postgraduate Training in Pathology**

#### **Duration**

The total training period of postgraduate training in Pathology is six years. The first year will be devoted to acquire knowledge in basic laboratory sciences. The trainees will undergo training in Histopathology, Clinical Haematology and Chemical Pathology from second year to the fifth year in local training centres. During the sixth year the trainees will undergo training in a centre of excellence in an overseas country.

#### **Curriculum**

The curriculum which would guide both the trainer and the trainee has been designed to encourage work based experiential learning. It will help the trainees to be active lifelong learners, and to take control over their own learning with a view to ensuring that the learning outcomes set in the curriculum are achieved by the end of the course enabling practicing independently as a consultant in his/her own field. It outlines the knowledge, skills, attitudes and the competence needed to be acquired for the award of board certification.

#### **Learning Experience**

The learning takes place mostly in the form of day to day routine work under supervision of a consultant who will give regular feedback to the trainee on the progress, standard of conduct and practice of a trainee. Regular black box sessions, multidisciplinary meetings, journal clubs, annual academic sessions of the relevant fields of medicine will be the other opportunities for learning.

### **2 Selection of Medical Officers for the Postgraduate Training Programme in Pathology**

A screening examination for selection of prospective trainees for the Postgraduate Training in Pathology will be held every year and entry to the training programme will be on the basis of success at the Screening Examination. Candidates will be tested on the knowledge in Pathology that an undergraduate is expected to possess.

<b>Contents</b>	<b>Page</b>
1. Overview of the Postgraduate Training in Pathology	01
2. Selection of Candidates	01
2.1 Eligibility Criteria	02
2.2 Examination for Selection of Trainees	03
3. Certificate in Basic Laboratory Sciences	04
4. Postgraduate Training in Histopathology	09
4.1 Diploma in Histopathology	10
4.2 MD Histopathology	13
5. Postgraduate Training in Clinical Haematology	17
5.1 Diploma in Clinical Haematology	17
5.2 MD Clinical Haematology	21
6. Postgraduate Training in Chemical Pathology	24
6.1 Diploma in Chemical Pathology	24
6.2 MD Chemical Pathology	26
7. Research Project	29

## 2.1 Eligibility Criteria

Prospective applicants must satisfy the following requirements.

- a) A medical degree registered \* with the Sri Lanka Medical Council.
- b) Satisfactory completion of internship acceptable to the Sri Lanka Medical Council.
- c) Satisfactory completion of one year of post internship in Medical/Clinical practice in a university/public/private sector institution in Sri Lanka acceptable to the PGIM.
- d) The criteria prescribed in paragraphs (a) to (c) must have been satisfied by the applicants as at the date of closure of applications, provided that where a short-fall has occurred due to any reasons including Sick, Maternity or Other leave, the doctor concerned should complete such shortfall in order to become eligible to apply for the Selection examination.
- e) In addition candidates who wish to enter the Clinical Haematology or Chemical Pathology training programmes will have to fulfill the following requirements.

### Haematology

- i) Candidate should have completed one year of post-intern appointment in a clinical discipline (ward setting, ICU, Anaesthesia)
- ii) At least 6 months of Adult Medicine or Paediatric appointment under supervision is mandatory during the intern/post intern period.

### Chemical Pathology

Six months of training in Adult Medicine or Paediatrics during the internship

OR

during the post-intern period, working in a General Medical or Paediatric ward under the supervision of a Consultant Physician or a Paediatrician for a six months period.

\* foreign nationals who seek to apply to register for selection examinations should possess a medical degree registrable with the Sri Lanka Medical Council. The decision of the Board of Management will be final in all such applications.

A quota for the private sector is presently available for most courses.

## 2.2 Examination for the Selection of Trainees for the Postgraduate Training in Pathology

The examination comprises an MCQ paper and a Short Essay/Essay paper.

### MCQ Paper

MCQ paper comprises of 45 questions.

General Pathology	10
Systemic Pathology	10
Haematology	10
Chemical Pathology	10
Microbiology	05

45 multiple choice questions are given to be answered in 2 hours and 15 minutes

**Those who obtain 45% or more for the MCQ paper will proceed to the Short Essay / Essay Paper.**

### Short Essay / Essay paper

The Short Essay /Essay paper comprises of 4 questions to be answered in two hours. The essay paper comprises one question from each of the following four specialties/areas; General Pathology, Haematology, Chemical Pathology and Systemic Pathology. Each question may have multiple components.

The pass mark for the Screening Examination will be 50%. The MCQ and the Essay papers contribute equally to the final mark (50% from each component).

### Selection

Depending on the number of training slots available and the merit order of those who have been successful at the selection test, candidates will be selected to follow the postgraduate training in Pathology. In addition, those who wish to enter the training programme in Clinical Haematology or Chemical Pathology need to fulfill the additional criteria given in this document. **Therefore, the selection of the specialty will be done at the outset.**

Those who are selected for the postgraduate training in Pathology will be enrolled to follow the one year training programme of Certificate in Basic Laboratory Sciences.

### 3. Certificate in Basic Laboratory Sciences

#### 3.1 Aim

To ensure that sufficient knowledge of the services of other fields of pathology is acquired to enable the use and interpretation of basic test results of those disciplines and to ensure sufficient basic background knowledge is acquired to proceed with a specialized training in one of the specialties of Pathology.

#### 3.2 Eligibility

Candidates should be successful at the Examination for the Selection of Trainees for the Postgraduate Training in Pathology.

The selected trainees will be posted to training centres to work full time. A course of supplementary lectures will be given mainly to cover Molecular Pathology, Basic Statistics, Genetics, Immunology, Embryology, Laboratory Management and Quality Control.

#### 3.3 Programme of the Basic Laboratory Sciences Course

This training comprises

- 3 month rotations in each of the three subspecialties;  
Histopathology  
Haematology  
Chemical Pathology
- 2 month rotation in Microbiology
- Trainees will have an exposure to Molecular Pathology, Statistics, Genetics, Immunology, Embryology and Laboratory Management. These areas will be covered by lectures.

#### 3.4 Learning Outcomes

At the end of the one year programme of Basic Laboratory Sciences trainees will be able to

1. describe the basic Pathological processes in terms of pathogenesis, morphological changes and their application in clinical situations.

2. describe specimen collection, transport, processing and clinical applications with regard to Histopathological, Cytological, Haematological, Microbiological and Chemical Pathological investigations
3. discuss the basis, value and limitations of the Molecular Biological and other special tests in the diagnosis, management and screening of diseases.
4. discuss the value of good laboratory management in improving the Pathology laboratory services
5. discuss the uses of statistics in the practice of Pathology.

### 3.5 Contents of the Basic Laboratory Sciences Course

#### 3.5.1 Histopathology

##### Subject Specific Knowledge

1. General Pathological processes
2. Pathogenesis and morphological changes of these processes
3. Scientific basis of the steps involved in tissue processing in the laboratory.

##### Practical aspects

1. Transport of tissues to the laboratory for different types of Histopathological and Cytopathological studies.  
Eg: routine, frozen section, cytology, electron microscopy, molecular biology
2. Various procedures carried out by the laboratory with regard to Histopathology. Eg: Special stains, Immunohistochemistry.
3. Scope and limitations of the above procedures.
4. Laboratory errors and the ways to rectify.

#### 3.5.2 Haematology

##### Subject Specific Knowledge

1. The scientific basis of the basic Haematological Investigations
2. A basic knowledge on the common Haematological diseases

##### Practical aspects

1. Venesections and collection of blood samples for Haematological tests
2. Preparation and staining of blood films.

3. Maintenance of laboratory registers and clinic registers.
4. Interpretation of basic changes in a blood film.
5. Laboratory safety and quality control
6. Detection of laboratory errors
7. Interpretation of analyzer reports
8. Communication with patients, laboratory staff and ward staff and the concept of team work

### 3.5.3 Chemical Pathology

#### Subject Specific Knowledge

1. A basic understanding of disease processes where Chemical Pathology tests are more commonly used.
2. Principles of quality assurance and application of this knowledge in the Chemical Pathology laboratory.

#### Practical Aspects

1. Venesections and collection of venous blood for routine Chemical Pathology tests
2. Giving instructions on preparation of patients for tests in Chemical Pathology.
3. Giving instructions on specimen transport and processing.
4. Basic steps involved in performing routine tests in Chemical Pathology.
5. The range of tests available in a Chemical Pathology laboratory.
6. A basic knowledge on the usage of basic laboratory equipment.
7. Interpretation of results of routine Chemical Pathology tests.
8. Laboratory safety.
9. Effective communication with the laboratory staff.

### 3.5.4 Immunology (Lectures 3 hours)

1. Normal Immunological mechanisms.
2. The Patho-Physiological basis of immune mediated diseases including autoimmune disease and hypersensitivity reactions.
3. The HLA system and Immuno-Pathological reactions involved in graft rejection
4. A basic knowledge on primary and acquired immune deficiency syndromes.

### 3.5.5 Microbiology and Parasitology (Lectures 6 hours)

1. Identification and classification of micro organisms
2. The normal flora of the human body
3. Clinical presentation and diagnosis of common infections.
4. Contribution of the laboratory to the diagnosis and management of infections.
5. Limitations of Microbiology laboratory investigations in patient management.
6. Safe laboratory practices.
7. Main hospital acquired infections and control of such infections

### 3.5.6 Genetics & Molecular Biology (Lectures 5 hours)

1. Genetic nomenclature.
2. A basic knowledge on how diseases are inherited.
3. The regulation of cell cycle and its importance in carcinogenesis.
4. Causes of DNA damage and the repair mechanisms.
5. Mutagenesis and its importance in causation of diseases.
6. Correlation of genetic aberrations to disease phenotype.
7. A basic knowledge on common chromosomal disorders and their phenotypic relationship.
8. Principles and strategies in identifying disease genes.
9. Molecular characterization of tumours.
10. Molecular pathogenesis and characterisation of cancers with examples.
11. Molecular diagnostic tests in cancer.

### 3.5.7 Statistics (Lectures 4 hours )

1. The uses of research and statistics in biomedical sciences
2. Definitions the following terms: Quality assurance, quality control, standard, control material, accuracy, precision, descriptive statistics, inferential statistics, reference interval, random error, systematic error, dispersion, delta check, confidence interval, inter and intra observer variation, standard normal distribution
3. Calculation of the following: sensitivity, specificity, efficiency, predictive value, mean, mode, median, range, correlation, variance and standard deviation.
4. The basic concepts of sampling and sampling methods and significance testing.

### 3.5.8 Embryology (Lectures -5 hours)

1. Introduction to developmental Biology
  - a. The fundamentals in developmental Biology
  - b. The key terminology in developmental Biology
  - c. The key developmental mechanisms
2. Molecular developmental Biology
  - a. The tests that should be requested and other resources that could be utilized to investigate development anomalies encountered in a clinical setting.

### 3.5.9 Laboratory Management (Lectures 5 hours)

1. The basic concepts of management of laboratory resources
2. Definition of quality management
3. The components of quality management
4. The value of quality policy statement for a laboratory
5. A basic understanding of quality manual and its contents
6. The value of internal quality control and external quality assessment
7. Basic concepts of laboratory accreditation
8. Pre-analytical and post analytical phases of quality assurance
9. The value of maintaining electronic records of patient data in terms of maintaining confidentiality and continuation of care (Laboratory informatics)
10. The components of a formal laboratory safety programme

### 3.6 Assessment

#### Eligibility:

A minimum of 80% attendance during the training period is essential to be eligible to sit the examination as for the other examinations conducted by the Postgraduate Institute of Medicine.

The Examination of the Certificate in Basic Laboratory Sciences Course comprises 60 multiple choice questions to be answered in 3 hours.

Histopathology/Histology	16
Haematology	16
Chemical Pathology	16
Microbiology / Parasitology	06
General	06

(The 6 general questions will be on Genetics, Immunology, Laboratory management, statistics, Molecular Pathology and Embryology)

Trainees need to obtain a minimum of 50% to pass the Certificate of Basic Laboratory Sciences Examination.

#### Qualification awarded

Those who are successful at the examination will be awarded **Certificate in Basic Laboratory Sciences**.

On successful completion of the Certificate in Basic Laboratory Sciences, trainees will commence their training leading to diploma in the respective discipline which they selected at the beginning. Those who are not successful at the Certificate in Basic Laboratory Sciences (CBLs) Examination could also proceed with their diploma training. However, such trainees need to be successful at the Certificate in Basic Laboratory Sciences Examination as a pre-requisite to sit the Diploma Examination in the respective disciplines. A candidate is allowed to sit only a maximum of 3 attempts at the CBLs Examination. Those who are unsuccessful at the third attempt will have to leave the training programme.

## 4. Postgraduate Training in Histopathology

#### Aim

To ensure that trainees are fully prepared to provide a high quality service at consultant level in a laboratory providing Histopathology and Cytopathology services.

#### Overview of the Course

The specialty of Histopathology would include Surgical Pathology, Cytopathology and Autopsy and therefore the postgraduate training in Histopathology would include all three components.

The postgraduate training in Histopathology takes place in two stages. On completion of 2 years of training in Histopathology the trainees will sit for the Diploma in Histopathology Examination. It is mandatory to pass the CBLs Examination as a pre-requisite to sit the diploma examination. Diploma in Histopathology is a bar examination and the candidates need to be successful at the diploma examination to proceed with the MD training in Histopathology. At the Diploma in Histopathology Examination theory knowledge will be tested at a high standard as there will be no theory component for the MD Examination.



On completion of the two years of MD training trainees will sit the MD Examination in Histopathology. Following successful completion of the MD Histopathology Examination trainees should undergo one year training in a Centre of Excellence overseas.

#### 4.1 Diploma in Histopathology

This is a two year training programme in Histopathology.

##### 4.1.1 Eligibility

Those who have completed the one year of Certificate in Basic Laboratory Sciences course with 80% attendance will be eligible to enter the programme.

##### 4.1.2 Learning Outcomes:

At the end of the two year programme the trainee will be able to

1. competently handle surgical Pathology specimens appropriately, interpret and write comprehensive reports on such specimens under the guidance of a consultant Histopathologist.
2. perform fine needle aspirations and interpret the basic changes in the smears of fine needle aspiration and other Cytology specimens.
3. Explain the scientific basis of processing and staining of Histopathological and Cytological specimens including the special stains.
4. perform Pathological postmortems and write a comprehensive report under the guidance of the supervisor.

##### 4.1.3 Contents:

###### Subject Specific Knowledge

1. Basic principles of Histochemical and Immunohistochemical special staining methods and their value and limitations
2. Sufficient knowledge in the microscopy, macroscopy and a general clinical knowledge in common diseases encountered in the Histopathology and Cytopathology practice

#### Practical Aspects

1. Knowledge of the basic principles of specimen dissection, macroscopic description and block selection in neoplastic and non neoplastic disease
2. Interpretation of macroscopic and microscopic features and available clinical data to diagnose or to give a differential diagnosis
3. Steps taken in situations where diagnosis is not possible.
4. Fine needle aspiration and handling of Cytology samples.
5. Interpretation of Cytology smears of fine needle aspirations and exfoliative Cytology smears ( Gynaecological and Non-Gynaecological Cytology).
6. Technical aspects of special stains and interpret the special stained slides with the Histological features.
7. Presentation of a case at a Clinico-Pathology meeting.
8. Different techniques used in Pathological autopsies and interpretation of the postmortem findings.

##### 4.1.4 Assessment :

###### Eligibility to sit the Diploma in Histopathology Examination:

Trainees who have passed the Examination of Certificate in Basic Laboratory Sciences and undergone two years of training in Histopathology at a training center approved by the Board of Study in Pathology will be eligible to sit the examination. A minimum of 80% attendance is essential as for the other examinations conducted by the Postgraduate Institute of Medicine.

##### 4.1.5 Diploma in Histopathology Examination

A Close Marking System will be adopted.

The following grades will be given for the candidates' performance at each component of the examination.

<b>M</b>	-	<b>Merit</b>
<b>P</b>	-	<b>Pass</b>
<b>B</b>	-	<b>Borderline</b>
<b>F</b>	-	<b>Fail</b>

### Theory:

The theory component comprises two Essay Papers each to be answered within 3 hours. Each paper comprises 4 questions. Out of the 4 questions one will be a Structured Essay Question. Candidates need to attempt all questions in each paper.

The minimum grades necessary to pass the theory component of the examination are P, P, P, P, P, B, B (can afford to fail one question however in arranging the merit order a score will be given to the question that was attempted but obtained fail marks as well)

### Practical Examination:

- |  |                    |
|--|--------------------|
| 1. Surgical Pathology 20 slides                      | Duration - 3hours  |
| 2. Cytology (8 slides) and special stains (2 slides) | Duration - 2 hours |

Out of the 30 slides the candidate should be able to obtain P grade for a minimum of 15 slides.

The emphasis is mainly on the theory component as theory will be assessed only in the Diploma stage.

In order to make the merit list the following scoring system will be used.

	<b>Grade</b>	<b>Score</b>
Merit	M	4
Pass	P	3
Borderline	B	2
Fail	F	1

The maximum score for Diploma in Histopathology will be 38 x 4

### Qualification awarded

Those who are successful at the examination will be awarded **Diploma in Histopathology**

## 4.2 MD Histopathology

This is a **2 year** training programme in Histopathology mainly concentrating on the practical and professional aspects.

All trainees will rotate to different centers for 1 year. The MD training includes a two week appointment in Radiology.

### 4.2.1 Eligibility

Trainees who are successful at the Diploma in Histopathology Examination will be eligible to commence the MD Histopathology training.

### 4.2.2 Learning Outcomes

At the end of the two years of pre-MD training in Histopathology the trainee will

1. have a sound knowledge and skills to take safe decisions in the Histopathological diagnosis.
2. be able to solve diagnostic problems by applying sound knowledge in basic principles and to decide when to seek advise/second opinion from a senior colleague
3. Integrate clinical and Pathological data for accurate diagnosis.
4. be able to perform Pathological autopsies with a high standard of practice in the techniques used for identifying morphological abnormalities at autopsy examination and write comprehensive autopsy reports.
5. strive to continue professional and self development.
6. be able to liaise effectively with the colleagues and the rest of the team who contribute to the patient care

### 4.2.3 Contents

#### Subject Specific Knowledge

1. A sound knowledge in the microscopy, macroscopy and a general clinical knowledge in the diseases encountered in the Histopathology and Cytopathology practice.
2. Grading, staging and classification of lesions according to the classifications systems/grading and staging systems currently in use.
3. The value, advantages and disadvantages of such systems.

4. Principles and the process of all investigations related to Histopathology - Eg; Immunohistochemistry, Electron Microscopy, Molecular Biology.
5. Scope and limitations of the above investigations.
6. Pathological mimics of various different disease entities and how these interpretive problems are resolved in daily practice.
7. Principles of audit, internal quality control and external quality assurance and accreditation of Histopathology and Cytopathology laboratories.

#### Practical aspects

1. Writing comprehensive/interpretive Pathology reports on all surgical Pathology specimens.
2. Conducting Clinicopathological meetings, Journal clubs and case discussions.
3. Reporting on any unusual cases and carrying out research projects and audits.
4. Critical evaluation of case reports and original papers published in journals.
5. Planning and conducting a research project and analysis of data.
6. Pathological postmortems, conducting, interpretation and writing comprehensive reports.
7. Describe the principles of safe laboratory practices and educate the laboratory staff on health and safety issues.
8. Ethical aspects of Histopathology laboratory practices.
9. The value of information technology in Histopathology practice.
10. Carrying out an audit in the Histopathology laboratory

The knowledge and skills developed during the Diploma training should be enhanced to be competent to function at the level of a consultant.

#### 4.2.4 Case book:

The trainee should maintain a portfolio of important cases.

The case book should be submitted at the end of the first year of MD training.

Five cases with one case of postmortem and one on cytology should be included.

Case books need to be approved by a board appointed panel for the candidate to be eligible to sit the MD Histopathology Examination.

#### 4.2.5 Assessment:

##### Eligibility to sit the MD in Histopathology Examination:

Two years of training with a minimum of 80% attendance and completion of the case book will be required to be eligible to sit the MD Histopathology Examination.

##### MD in Histopathology Examination:

The Board of Examiners includes an external examiner.

A Close Marking System will be adopted.

The following grades will be given for the candidates' performance at each component of the examination.

<b>M</b>	-	<b>Merit</b>
<b>P</b>	-	<b>Pass</b>
<b>B</b>	-	<b>Borderline</b>
<b>F</b>	-	<b>Fail</b>

The MD Histopathology Examination comprises 4 practical examinations

1. **Histopathology** 15 slides                      Duration - 3 hours

A detailed description and a comprehensive discussion is expected for each case.

2. **OSPE** 15 stations                                      Duration - 3 hours

(Endoscopic and other biopsies, special stains, artefacts, macroscopic examination and cut up)

3. **Cytology** 15 slides                                      Duration - 2 hours

For each slide/station in the above 3 components a grade will be given. The candidate needs to obtain a **P** grade for 10 out of 15 slides/stations of each component to pass.

4. This component has 3 parts.

<b>Clinicopathological Conference</b>	20 minutes
<b>Viva (General)</b>	20 minutes
<b>Postmortem examination</b>	

For the fourth component candidate needs to obtain a minimum of **P, P, B**

In order to make the merit list the following scoring system will be used.

	<b>Grade</b>	<b>Score</b>
Merit	M	4
Pass	P	3
Borderline	B	2
Fail	F	1

The maximum score for MD will be 48 x 4

#### **Qualification awarded**

Those who are successful at the examination will be awarded **MD in Histopathology**

#### **4.2.6 Criteria for Board Certification**

For the purpose of board certification, candidates who have been successful at the MD Histopathology Examination should complete

- One year post MD overseas Training
- A Research project

The project proposal and the report have to be approved by the Board of Study in Pathology. It can be done any time during the MD and post MD training.

Instead of a project two publications in refereed journals or one in an indexed journal where the candidate is the first author can be submitted. Published case reports will not be considered for this exemption.

Research projects that were carried out overseas can be forwarded for approval from the Board of Study in Pathology. But the candidate needs to have a local supervisor in addition to the overseas supervisor for such projects.

Candidates who fulfill the above criteria will be board certified as **Specialist in Histopathology**.

### **5. Postgraduate training in Clinical Haematology**

#### **Aim:**

To produce a medical specialist who is an independent authority of the field of laboratory and clinical Haematology.

#### **Eligibility:**

Those who have completed the one year of Certificate in Basic Laboratory Sciences course with 80% attendance

#### **And**

completed one year of post-intern appointment in a clinical discipline (ward setting, ICU, Anaesthesia) with at least 6 months of Adult Medicine or Paediatric appointment under supervision during the intern/post intern period.

#### **5.1 Diploma in Clinical Haematology**

This is a two year training programme in Haematology.

##### **5.1.1 Eligibility:**

Those who have fulfilled the above eligibility criteria will be allowed to enter the two years training programme leading to Diploma in Clinical Haematology.

##### **5.1.2 Learning Outcomes:**

At the successful completion of two years training programme, the trainee is expected

1. to possess thorough theoretical knowledge in fundamental aspects of Haematology
2. to have obtained comprehensive practical skills in laboratory investigations related to Haematological diseases and interpretation of laboratory results.

3. to be able to manage a Haematology laboratory, and to guide technical staff in laboratory work.
4. to conduct Haematology clinics

The following aspects will be mastered during the two year in-service training at a recognised training centre.

### 5.1.3 Contents:

1. Haematopoiesis  
Normal Haematopoiesis  
Haematological, Biochemical and clinical findings of;
2. Anaemia
  - 1) Deficiency Anaemias and Iron, B12., Folate Metabolism.
  - 2) Anaemia of Chronic Disorders
  - 3) Aplastic Anaemia and other types of Bone marrow failure
  - 4) Genetic Disorders of Haemoglobin
  - 5) Inherited and Acquired Haemolytic Anaemia
  - 6) Congenital and Acquired Dyserythropoietic Anaemia
3. Non neoplastic and neoplastic white cell disorders
  - 1) Morphology and functions of Lympho-Reticular system
  - 2) Normal Lymphocyte and Non-neoplastic Lymphoid Cell Disorders
  - 3) Phagocyte and Phagocytic Disorders
  - 4) Haematological Malignancies, Leukaemia, Lymphoma, Myelomatosis, Myeloproliferative disorders and myelodysplastic Syndromes
  - 5) Bone Marrow Transplantation
4. Haemostasis and bleeding disorders
  - 1) Normal Haemostasis
  - 2) Inherited and Acquired Platelet Disorders
  - 3) Inherited and Acquired Coagulopathies
5. Thrombosis and thrombophilic conditions
6. Transfusion Medicine
  - 1) Immune-Haematology
  - 2) Antigens in Human Blood
  - 3) Clinical Blood Transfusion

### 7. Practicals

Routine and special Haematological procedures, laboratory tests and Interpretation of results :

- 1) Bone marrow aspiration and trephine biopsies.
- 2) Special stains
- 3) Immune marker studies
- 4) Coagulation tests
- 5) Serological tests – related to Blood Bank serology
- 6) Other special Haematological tests.

### 8. Laboratory instrumentation in Haematology

- 1) Automated analyzers and their working principles.
- 2) Understand Principals and application of Instruments including Quality Control, Calibration and Operation.

### 9. Quality assurance

- 1) Internal quality control
- 2) External quality assessment
- 3) Laboratory accreditation

### 5.1.4 Assessment:

#### Diploma in Clinical Haematology Examination

#### Eligibility to sit the Diploma in Clinical Haematology Examination:

Trainees who have passed the Examination of Certificate in Basic Laboratory Sciences and undergone two years of training in Clinical Haematology at a training center approved by the Board of Study in Pathology will be eligible to sit the examination. A minimum of 80% attendance is essential as for the other examinations conducted by the Postgraduate Institute of Medicine.

#### Theory

Theory Paper 1 - 03 hours - with a choice of 04 out of 05 Essay type questions

Theory Paper 11 - 03 hours - with a choice of 06 out of 07 Structured type questions

Candidates who obtain minimum of 50% marks will be called for practicals, which will be held two to four weeks after the theory papers.

Candidates should sit for both theory and practical components of the examination. However in the case of failing the practical component they will be allowed to sit for the practical component alone to complete the examination. But it has to be completed in two consecutive attempts.

### **Practical Examination**

- \* Transfusion - One - problem based wet practical and short questions - 03 hours
- \* Coagulation - One - Wet practical and Data interpretation - 03 hours
- \* Morphology - 15 to 20 short cases - 03 hours
- \* Long Cases - 06 to 08 cases - Morphology and Data interpretation - 03 hours

**Viva** - 30min. - (15 min. each), by two Panels

### **MARKS**

- \* Theory - 40%
- \* Practicals - 50%
- \* Viva - 10%

The candidate should obtain minimum of 45% marks for each sub component of the practical examination.

The overall pass mark for the Diploma in Haematology examination is 50%.

An External examiner will be present for the practical and Viva components of the examination.

The candidates who are successful in above examination will be eligible to follow the MD Clinical Haematology course.

The format of the examination may be subjected to modifications depending on the circumstances, which will be notified to candidates in advance.

### **Qualification awarded**

Those who are successful at the examination will be awarded **Diploma in Clinical Haematology**

## **5.2 MD Clinical Haematology**

### **5.2.1 Eligibility:**

Trainees who are successful at the Diploma in Clinical Haematology Examination will be eligible to commence the MD Clinical Haematology training.

### **5.2.2 Learning Outcomes:**

At the successful completion of the MD training programme the trainee is expected

- 1) to be an “Authority of the subject” while possessing broad, unlimited knowledge and skills in Haematopathology, Clinical Haematology and other relevant aspects.
- 2) to function as a head of the Haematology unit in the health services or hold a senior academic position in the university system.
- 3) to conduct and supervise undergraduate and postgraduate training in Haematology, continuing medical education activities and research work.
- 4) to maintain academic links with other national and international institutions in the field, to assure that the services are kept in par with acceptable international standards.
- 5) to function in advisory capacity to the government or relevant for furtherance of the Haematological services in Sri Lanka.

This is a two year in-service, supervised training in Clinical Haematology at a recognized centre. Trainees will be under the direct supervision of a Consultant Haematologist, who will release them to following specialized clinical training units. While working in the clinical units, under supervision of appropriate specialists trainees are expected to be closely associated with the Haematology unit / laboratory of the training centre.

### 5.2.3 Attachments ;

- \* **General Medicine – One year** - comprise of two six months attachments in adult male and female wards. During this appointment, trainees shall take part in all activities of the clinical medical unit including routine ward work, clinics, casualty management, night on calls , clinical discussions etc. The trainee is advised to take special interest in management of patients with haematological problems.
- \* **Clinical Oncology – four months** - comprise of two months attachments in the adult and Paediatric Oncology units with special interest in patients with Haematological problems.
- \* **Clinical Paediatric Haematology - three months** - in specialized paediatric units.
- \* **Medical Intensive Care unit - One month**
- \* **Cardiology unit - One month**
- \* **Training in Special Clinical Settings in Haematology – one month** Haemophilia Centre, Thalassaemia Centre, Bone Marrow Transplant Unit, Anticoagulation clinics

### 5.2.4 Assessment:

#### Eligibility to sit the MD in Clinical Haematology Examination:

Two years of training as specified in this document with a minimum of 80% attendance.

#### MD in Clinical Haematology Examination:

**Theory Paper – Essay paper** - with a choice of four out of five questions - **3 hours**  
**OSPE** - **15 stations (morphology )** - **2.5 hours**  
**Clinical** - **two long cases (patients)** - **1.5 hours**  
**Data interpretation – with two case discussions** - **1.5 hours**  
**Transfusion and Coagulation data interpretation** - **3 hours**

### Viva – 40 minutes- 20 minutes each by two panels

#### Marking

A close marking system is applied.

The candidate should individually pass all the components of the examination at the successful attempt.

#### Qualification awarded

Those who are successful at the examination will be awarded **MD in Clinical Haematology**

**5.2.5 Research Project :** The trainee shall conduct a research project during the MD training.

#### Guidelines:

<b>Topic</b>	Must be of current Haematological interest. Trainees are advised to consult their supervising Haematologist in deciding on a topic.
<b>Length and Type</b>	Generally a one year project A retrospective , prospective or case study
<b>Project Proposal</b>	Should be submitted to the Board of study within the first three months of the MD training , for approval.
<b>Report</b>	A duly completed project report / case book should be submitted to the Board of Study for assessment. Candidate has to defend the project / case book in front of two member panel of assessors appointed by the Board of study. The total acceptance of the project / case book is a prerequisite for the Board certification.

**Overseas training** The candidates who are successful at the MD Clinical Haematology examination should undergo a minimum of 12 months training attachment at a centre of excellence in Haematology. This attachment could be in the capacity of a Registrar, Lecturer, Visiting fellow or any other form acceptable to the Board of Study in Pathology.

### 5.2.6 Board certification

The following criteria should be fulfilled for Board certification.

1. Candidates should pass the MD examination.
2. Candidates should satisfactorily complete the one year overseas training.
3. The research project has to be accepted by the Board of Study in Pathology.

Candidates who fulfill the above criteria will be board certified as **Specialist in Clinical Haematology**

## 6. Postgraduate Training in Chemical Pathology

### Aim:

To produce a specialist medical officer who will be able to act in the capacity of a Consultant Chemical Pathologist in a State or Private sector Chemical Pathology Laboratory, and take the initiative to provide and maintain quality Chemical Pathology services as deemed suitable for the population of Sri Lanka.

### 6.1 Diploma in Chemical Pathology

This is a two year training programme in Chemical Pathology. The period of training is designed to equip the trainee with the core knowledge and skills for the practice of Clinical and Laboratory Chemical Pathology.

#### 6.1.1 Eligibility:

Completion of the Certificate in Basic Laboratory Sciences course with 80% attendance

**and**

Six months of training in Adult Medicine or Paediatrics during the Internship **OR** during the post-intern period, working in a ward or a similar clinical setting, under the supervision of a Consultant Physician or Paediatrician.

### 6.1.2 Learning Outcomes:

By the end of the 2 years of training the trainee will be able to

1. describe the laboratory techniques that underlie clinical laboratory practice, and good laboratory practices including health, safety and quality assurance.
2. describe the presentation, differential diagnosis and natural history of the common disorders encountered in the practice of Chemical Pathology.
3. offer advice on the interpretation of laboratory results using the understanding of Chemical Pathology acquired during the training period.
4. plan, organise and supervise the running of a diagnostic Chemical Pathology service to assist with patient-care in hospitals in Sri Lanka.

### 6.1.3 Diploma in Chemical Pathology Examination:

#### Eligibility:

Trainees who have passed the Examination of Certificate in Basic Laboratory Sciences and undergone two years of training in Chemical Pathology at a training center approved by the Board of Study in Pathology will be eligible to sit the examination. A minimum of 80% attendance is essential as for the other examinations conducted by the Postgraduate Institute of Medicine.

#### Theory

The theory component carries 40% of the final mark.

Paper I	20%	
Multiple choice questions	20 questions	Duration - 1 hour



Paper II	20%	Duration - 2 hours
Essay type		
Four questions will be given		
Clinical – 1 essay, 1 short notes		
Analytical – 1 essay, 1 short notes		

**Practical 50%**

Practical Paper	20%	
Structured questions, data interpretation		
10 – 12 questions		Duration - 2 hours

Wet practical	30%	Duration - 3 hours
---------------	-----	--------------------

Viva voce	10%	Duration - 20 minutes
-----------	-----	-----------------------

**The percentage of marks for each component contributing to the final mark is as follows.**

**Theory 40% minimum**

**Practical 50% minimum**

Candidates need to obtain a minimum of 50% to pass.

**Qualification awarded**

Those who are successful at the examination will be awarded **Diploma in Chemical Pathology**

**6.2 MD in Chemical Pathology**

**Eligibility :** Successful completion of Diploma in Chemical Pathology Examination

**6.2.1 Learning Outcomes:**

At the end of the 2 years training of the MD in Chemical Pathology the trainee will be able to

1. efficiently manage a Chemical Pathology service in a hospital.
2. demonstrate adequate knowledge, skills and appropriate attitude in routine and specialized clinical and laboratory work.
3. demonstrate responsibility in taking safe clinical decisions pertaining to Chemical Pathology services, acknowledge the limitations of competence and refer to other senior colleagues for advice where appropriate.
4. interpret test result following technical and clinical validation.

5. perform diagnostic techniques to become technically competent in practical work and master the underlying analytical and clinical principles.
6. provide specialist advice in Chemical Pathology related to specialized areas such as clinical endocrinology, Paediatrics, toxicology and molecular medicine.
7. plan, design and carry out research related to the development of the service, analyze the results and write a report.
8. carry out activities of continuing professional development such as literature searches, case discussions and journal clubs.
9. plan and implement new techniques and practices following adequate evolution procedures.
10. describe the bio-safety practices required in a Chemical Pathology laboratory.
11. describe the ethical aspects of Chemical Pathology laboratory practice in relation to investigations, research, teaching and quality control.
12. describe the principles of audit, internal quality control, external quality assurance and accreditation of a Chemical Pathology laboratory.
13. explain the value of information technology in Chemical Pathology service.

**6.2.2 Case Book:**

The case book should be submitted at the end of the first year of MD Chemical Pathology training.

Five prospective cases having different clinical settings should be included after consultation with the supervisor and submitted to the Board of Study in Pathology with the supervisor's approval of the case write-up.

The case book needs the approval of the Board of Study in Pathology, in order to appear for the MD Chemical Pathology examination. The contents of the case book will be discussed at the viva voce examination.

**6.2.3 Research Project:**

The trainee should submit the proposal for the research project for approval by the Board of Study in Pathology within the first three months of the first year of training for MD in Chemical Pathology.

The final report of the research project and the reports of the evaluators should be submitted to the Board of Study in Pathology and the Examination branch of the PGIM, 3 months prior to the commencement of the MD examination. The contents of the research project will be discussed at the viva voce examination.

#### 6.2.4 Assessment:

##### Eligibility:

To be eligible to sit the MD Chemical Pathology Examination the candidate should have

1. completed 2 years of training in Chemical Pathology for the MD in approved centres and certified by the supervisor.
2. completed Case book.
3. completed Research Project.
4. a minimum of 80% attendance as for the other examinations conducted by the Postgraduate Institute of Medicine.

#### 6.2.5 MD Chemical Pathology Examination:

An external examiner will be present for the entire examination.

##### Theory

Theory Paper 1 (Analytical)    Duration – 3 hours    **20%**

Six questions will be given and the candidate needs to answer only 4 questions. 2 questions will be to write short notes on 3 out of 4 topics.

The other questions are essay type.

Theory Paper 2 (Clinical)    Duration -3 hours    **20%**

Essay type questions and short notes with the same format.

##### Practical

Practical Paper I (Analytical)    Duration – 2 hours    **15%**  
Calculations, reporting, interpreting

Practical Paper 2 (Clinical)    Duration – 2 hours    **15%**  
Reporting, interpreting

Practical 3 (Wet Practical)    Duration – 06 hours    **20%**  
Plan, design perform and report the results of a wet practical

##### Viva voce

Duration – 45 minutes

**10%**

All aspects of the curriculum, case book and research project will be discussed.

##### Qualification awarded

Those who are successful at the examination will be awarded **MD in Chemical Pathology**

#### 6.2.6 Board Certification

The following criteria should be fulfilled for Board certification.

1. Candidates should pass the MD examination.
2. Candidates should satisfactorily complete the one year overseas training.

Candidates who fulfill the above criteria will be board certified as **Specialist in Chemical Pathology**

#### 7. Research Project for MD Histopathology, Clinical Haematology, and Chemical Pathology

##### Aim:

To enable trainees to develop competence in conducting a basic research in their specialty and appreciate significance and limitations of the results.

##### Learning Outcomes:

Upon completion of the project, trainees will be able to

- Demonstrate competence in conducting a literature search and select references relevant to a particular topic.
- Develop appropriate methodology and conduct a practical research.
- Prepare a scientific project proposal.
- Draw conclusions on the results and make recommendations.

- Relate research findings to pre existing information.
- Demonstrate the capability to communicate research findings as a well written project report displaying results clearly and constructive discussion on the results.

**Assessment**

The project proposal will be assessed by a panel of examiners in the relevant field and the project report will be assessed by the same examiners.