

CURRICULUM FOR D.M. COURSE
IN
HEMATOLOGY

MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES

NASHIK

SECTION –I (Goals)

The aim of the course is to develop human resources and personnel in The field of Hematology who shall

- i) Provide the health care to the patients needing hematological care
- ii) Teach and train future undergraduate and postgraduate medical students and Junior doctors in Hematology in Medical Colleges, Institutions and other Hospitals.
- iii) Carry out and guide research to improve the practice of the art and science of Hematology
- iv) Have management capabilities to manage personnel and budgets etc. to make health more cost-effective.
- v) Organize health teams to provide care during natural or man-made calamities

Branch III: Haematology Syllabus for DM [Hematology]

Under the auspices of Maharashtra University of Health Sciences, Nashik

Objectives

At the end of the integrated training in Hematology it is expected that the qualified trainee will be able to:

- 1) Diagnose and manage all patients with non-malignant and malignant diseases of the hemopoietic and related systems.
- 2) Recognize the nature, assess the significance and manage the hematological complications of non-hemopoietic diseases and their therapy.
- 3) Evaluate and deal appropriately with systemic and non-hematological complications of inherited and acquired disorders of the blood.
- 4) Interpret laboratory data and synthesize laboratory and clinical data so as to provide rational solutions for patients with hematological problems.
- 5) Supervise the activities of a hematology laboratory, where necessary

Clinical experience must include opportunities to observe and manage patients with a wide variety of blood diseases on an inpatient and outpatient basis. The trainee must be given the opportunity to assume continuous responsibility for acutely and chronically ill patients in order to observe the evolution of blood diseases as well as the benefits and adverse effects of therapy.

SECTION –II

Course content:

Curriculum

I. Practical Laboratory Training

A. General Hematology

1. Proper use and care of common instruments such as light microscope, centrifuge, water baths, freezers, weighing balance, etc.
2. Blood collection samples - venepuncture and finger prick methods of sample collection, types of anticoagulants, containers and the effects of delay in processing and storage.
3. Determination of peripheral blood counts (Hemoglobin, Hematocrit, Total WBC and platelets) manually and calculation of red cell indices.
4. Use of automated blood cell counters including principles and practice. Interpretation of peripheral blood counts and abnormal flags.
5. Preparation of blood films and, staining of peripheral blood films and cytopsin slides with Romanowsky and other dyes.
6. Review of normal and abnormal blood films with emphasis on morphology of red cells, white cells and platelets.
7. Performance of WBC differential counts; subjective assessment of platelet counts and diagnostic interpretation of abnormal counts.
8. Preparation and staining of thick and thin blood films for malarial parasites.
9. Measurement and significance of ESR and plasma viscosity.
10. Supravital staining of reticulocytes, counting of reticulocytes.
11. Performance of bone marrow aspiration; trephine needle biopsy, splenic aspiration.
12. Preparation of smears of bone marrow aspirates and biopsy [touch] imprints. Staining and diagnostic evaluation of bone marrow aspirates.
13. Performance of sickling and solubility tests and screening for red cell G6PD activity with interpretation of results.

B. Laboratory evaluation of hemolytic anemias

1. Hb S solubility test,
2. Screening for unstable hemoglobin, supravital staining of Hb H inclusions.
3. Principles and practice of separation and identification of normal and abnormal hemoglobins by electrophoresis and chromatography,
4. Quantitation of normal and abnormal hemoglobins by densitometry and chromatography,
5. Quantitation of HbF by alkali denaturation and cellular distribution of HbF by Kleihauer acid elution technique,
6. Heinz body preparation,
7. Screening for G6PD deficiency and quantitative estimation of G6PD and other red cell enzymes.
8. Direct and indirect Coomb's test, warm and cold autoantibody titres,

9. Miscellaneous biochemical test on red cell, plasma and urine,
 - i. Principle and procedures for estimation of plasma bilirubin and haptoglobin; and significance of the results, screening for methaemalbumin, methaemoglobin and sulphaehemoglobin,
 - ii. Screening for cryoglobins, principles of immunoglobulin estimation and immune electrophoresis,
 - iii. Estimation of urine for Hb, red cells, hemosiderin, urobilinogen and bilirubin,
 - iv. Principles of estimation of serum ferritin and iron /TIBC,
 - v. Principles and estimation of red cell folate, serum folate and serum cobalamin.

C. Laboratory Investigations of Bleeding Disorders

Platelets

- 1) Performance of Ivy bleeding time and platelet count; study of platelet morphology
- 2) Principles, practice and interpretation of platelet aggregometry tests.
- 3) Platelet associated immunoglobulin (PAIgG) and circulating antiplatelet antibodies.

Screening for coagulation factor abnormalities:

1. Prothrombin time and stypven time.
2. Activated partial thromboplastin time
3. Thrombin time and reptilase time.
4. Plasma fibrinogen.
5. Correction studies with normal plasma, adsorbed plasma, aged serum and factor deficiency plasmas.
6. FDP and D-Dimers.
7. Assays of clotting factors particularly factors VIII and IX.
8. Urea solubility test for factor XIII
9. Euglobulin lysis time and other relevant tests of plasma fibrinolytic activity.

D Laboratory Investigation of Thrombotic Disorders

Principles:

1. Assays of plasma AT III, protein C, protein S, Factor V Leiden
2. Screening for lupus anticoagulant and activated protein C resistance-principles of screening tests and interpretation of results.
3. Laboratory monitoring of anticoagulant (heparin and oral anticoagulants) therapy.

E. Cytochemistry

Performance of the following staining procedures, Sudan Black, Myeloperoxidase, specific and non specific esterases, acid phosphatase. PAS and iron staining.

F. Cytogenetics

Familiarisation with cytogenetics, understanding the principles of cytogenetics and appreciating the relevance and significance of chromosomes in diagnostic hematology, interpreting the results of chromosome preparation of hemopoietic cells.

G. Transfusion Medicine

1.
 - a. ABO blood grouping (forward and backward); Rh typing (phenotypes and genotypes), screening of antibody in sera of donors and recipients, antibody identification following elution by various techniques.
 - b. Blood group compatibility (crossmatching) testing.
 - c. Investigation of ABO, Rh and other immunohaemolytic diseases of the newborn.
 - d. Practical aspects in the selection of blood for neonatal exchange transfusion.
2. Donor evaluation & recruitment.
3. Clinical evaluation and laboratory screening of donors to phlebotomy.
4. Phlebotomy of donors.
5. Blood component preparation and storage.
6. Practical and administrative procedures involved in issuing and transfusing blood.
7. Principles of the mechanics of the cell separator and its use for blood component preparation and therapeutic apheresis.
8. Practical steps in the laboratory investigation of transfusion reactions.
9. Quality control

H. Flow Cytometry

A working knowledge of the principle and practice of flowcytometry and interpretation of the clinical significance of common leukocyte immunophenotypes.

I Laboratory Equipment and Organization

A working knowledge of the mechanics of the various laboratory instruments including their operation, calibration and basic maintenance, is desirable.

1. Laboratory space distribution; ordering, siting and installation of laboratory equipment; workflow procedures and handling of samples.
2. Staffing – technical and non-technical.
3. Use of computers and generation of laboratory statistics.
4. Health and Safety measures.[Physical/Chemical/Biological/Radiation]
5. Waste disposal.
6. Quality Assurance (Internal and External) measures.
7. Budgeting

II. Histopathology Module

Practical laboratory training and related theory should cover the following areas:

1. General processing of tissues, especially Lymph Node Biopsy, Bone Marrow trephine biopsy, F.N.A.C and other tissues with special emphasis on leukemic deposits of lymphomatous involvement.
2. Techniques of cytology including cytopsins in relation to body fluid of patients with hematological disorders.
3. Immunocytochemistry relevant to Hematology.
4. Electron microscopy of hemopoietic cells.

III Biochemistry Module

A. Laboratory Techniques :

Practical “hands –on” experience and related theoretical background in the following:-

1. Separation procedures – electrophoretic techniques, chromatography
2. Immunochemical methods.
3. Radioimmunoassays.

IV HLA Module

Demonstration and understanding the principles of:-

1. Separation of lymphocytes using density gradient and centrifugation.
2. The microlymphocytotoxicity test and its application in HLA typing, crossmatching and antibody screening.
3. The mixed lymphocyte reaction: one way and two-way cultures.
4. Miscellaneous investigations (on request) including mitogen and antigen induced lymphocyte transformation and neutrophil function assays.

V. Molecular Biology Module

Understanding the principles involved in the molecular diagnosis of hematological disorders.

1. DNA separation
2. PCR
3. RFLP and Southern Blotting.

II. Clinical Haematology Training

With appropriate guidance and under supervision, the post graduate trainee will be responsible primarily for the acquisition of knowledge in all areas of hematology and Transfusion Medicine. Such knowledge will be acquired and demonstrated through seminars, case presentations, journal clubs, tutorials and proper use of library for suggested reading and formal reviews of major selected topics. Faculty staff should be present at these various exercises so as to provide the appropriate inputs. When necessary faculty staff may be required to review certain subjects in form of formal lectures. Clinical experience will be acquired by the trainee by day to day management of all patients admitted to the hematology service. Faculty will also be involved in teaching of trainees in the ward-rounds and outpatient clinics.

I. Red Cell Disorders

Clinical evaluation of a patient with anemia: history, physical examination, appropriate laboratory investigations and management. Comparative epidemiologic significance of 'nutritional' and other anemias in the population and the national programme for control.

1. Iron Deficiency Anemia

Epidemiology, iron deficiency as a community health problem, causes in the population, control strategies in the population. Evaluation of the individual patient, interpretation of serum iron, TIBC, transferrin. Indications for and interpretation of ferrokinetic studies, management including iron replacement.

2. Megaloblastic Anemia

Clinical and laboratory evaluation, clinical recognition, evaluation and management of complications of vitamin B12 deficiency investigation of etiology and management. Understanding the role of vitamin B12 and folate in cellular metabolism and the interaction of disease and drugs with the metabolism of folate.

3. Hemolytic anemia

a. Evaluation of a patient with hemolysis and investigations of its causes.

i) Thalassemia: principles of control of the thalassemia syndromes in the population, screening strategies, antenatal diagnosis, genetic counseling, clinical and laboratory diagnosis of alpha and beta thalassemia syndromes. Management of thalassemia intermedia and major-transfusion regimes chelation, role of splenectomy and bone marrow transplantation. Comprehensive thalassemia care center, its functions, role of the staff, social workers and paramedics, etc.

ii) Sickle cell disease: Evaluation, management of the steady state, management of painful and anemic crisis, management of chronic complications, clinical and hematological features of the various sickle cell diseases, clinical and hematological effects of the interaction of thalassemia with sickle cell anemia, therapeutic role of bone marrow transplantation.

iii) Inherited enzymopathies (Red Cell G6PD deficiency): Evaluation and management of acute hemolytic crisis.

iv) Acquired hemolytic disorder: Immune hemolytic anemia management with immunosuppression, role of intravenous immunoglobulin, plasmapheresis, and splenectomy. Clinical and laboratory evaluation (etiological diagnosis) of patients suffering from acquired intravascular hemolysis.

4. Aplastic Anemia

Etiology, evaluation and management including immunosuppression (Antilymphocyte globulin, etc) and supportive therapy. Role of bone marrow transplantation in treatment of the individual patient; preparation for bone marrow transplantation.

5. Pure red cell anemia

Diagnostic evaluation and treatment of congenital and acquired forms. Transient erythroid aplasia including the pathogenic role and biology of the human B19 parvovirus.

II. White cell disorders

1. Neutropenia

Clinical evaluation of a neutropenic patient, role of surveillance microbiology, antimicrobial therapy in neutropenia, role of growth factors, principles in providing a sterile environment for the neutropenic patient.

2. Functional Disorders of neutrophils

Neutrophil function, laboratory tests for evaluation and management of patient with chronic neutrophil dysfunction, role of growth factors and bone marrow transplantation.

3. Leukemia

Clinical evaluation, diagnostic confirmation by morphology, immunophenotyping, special stains, cytogenetics and electron microscopy. The trainee must be familiar with the principles of leukemia management and the various protocols available. He/she should be familiar with the statistical tools used to evaluate therapy protocols, survival curves etc. He /she should also be familiar with the pharmacology of antimitotic drugs and their toxicity and well versed in the supportive management of patients with all types of leukemia.

4. Myeloproliferative disorders

Classification, systemic diagnostic evaluation of erythrocytosis, including polycythemia vera; interpretation of blood volume studies; with radionuclides, familiarity with current management strategies of MPD including the use of interferon.

5. Lymphoma

Classification of lymphomas, principles of staging and management of different types of lymphomas

6. Immune Deficiency Disorders

Trainees must be able to order systematically the appropriate investigative scheme for a patient with congenital or acquired immunodeficiency they must understand the principles of management with immunoglobulin replacement, interferon, and bone marrow transplantation and be familiar with the hematological manifestations and their therapy of AIDS.

7. Multiple Myeloma and other Paraprotein anemias

Clinical and laboratory evaluation of a patient with a monoclonal gammopathy. Interpretation of quantitative immunoglobulin levels, serum protein electrophoretic strips and immunoelectrophoresis patterns, concept of monoclonal gammopathy of undetermined significance (MGUS); management of Myeloma and Waldenstrom's macroglobulinaemia.

8. Miscellaneous disorders like Histiocytosis, Splenic disorders and systemic diseases affecting the haemopoietic system, etc.

III. Hemostasis

Trainees should be thoroughly grounded in the general clinical (history and physical signs) approach to the patient with a bleeding tendency.

1. Thrombocytopenia
Thorough understanding of platelet kinetics and evaluation with radionuclides. Evaluation and investigation of the etiology of thrombocytopenia. The student should be conversant with the spectrum of management including immunosuppression, intravenous immunoglobulin, plasmapheresis and immunoadsorption.
2. Inherited platelet function disorders
Clinical evaluation, laboratory diagnostic strategies and management.
3. Inherited coagulation factor deficiencies
Laboratory diagnosis of hemophilia genetics and antenatal diagnosis. Principles of factor replacement; factor replacement schedule in a patient with hemophilia who needs surgery; management of complications. Principles of management of patients with inhibitors. Organization of hemophilia care center and training.
4. Acquired bleeding disorders
Vitamin K deficiency and supplementation; DIC its causes and management, management of haemorrhagic complications of liver disease and renal failure, after cardiothoracic surgery.
5. Thrombotic Disorders
Classification and laboratory diagnosis of inherited thrombotic disorders; evaluation of hemostasis in the acquired thrombotic disorders, clinical use and monitoring of anticoagulants.

IV Transfusion Medicine

1. Blood component preparation and their clinical use
Collection of blood, correct techniques of venepuncture, plastic systems, anticoagulants and additives, and their effect of storage stability, centrifugation, preparation of platelets, fresh frozen plasma and cryoprecipitate, storage of components, principles of fractionation. Quality control. A thorough understanding of the clinical indications for proper use of specific blood components.
2. Diagnosis & Management of Transfusion related complications
Febrile transfusion reactions- laboratory investigations, diagnosis, management and prevention. Diagnosis and management of hemolytic transfusion reactions. Infections transmitted by transfusion, physical and clinical complications of transfusion.
3. Cell separation principles
The trainee must be able to perform cell separation and apheresis. Principles of cell separators; continuous versus intermittent flow techniques, replacement fluids for plasmapheresis, current status and indications in various diseases should be known and understood.
4. Techniques of leuco-depletion
Problems related to white cells in donor blood and techniques of removal. Principles of filter design and use.
5. Irradiation of blood and components
Biology of irradiation of blood and components, transfusion graft versus host disease [GVHD] Indications for irradiation of blood and protocols. Use of equipment.
5. Management of alloimmunization in relation to transfusion
Techniques for prevention of alloimmunization, role of ultraviolet radiation and photosensitizers, management of patients with red cell and platelet alloantibodies.
6. Management in relation to Blood Transfusion, at the time of Disaster or natural calamities.

V. Bone Marrow Transplantation

The student must be familiar with current indications and results of bone marrow transplantation in various diseases.

1. Donor selection
HLA typing and MLR in bone marrow transplantation, screening of Donor
2. Conditioning regimens
the trainee must be familiar with the different conditioning regimens, principles of their use in different disorders and complications

3. Harvesting and manipulation of the bone marrow
Bone marrow collection, red cell or plasma reduction, peripheral blood stem cell mobilization and collection, cryopreservation, Transfusion of marrow. Purging of marrow –T cell depletion.
4. Transplantation immunology
Histocompatibility, graft versus host disease – diagnosis and management. Immune reconstitution following transplantation.
5. Management of post transplant patient

VI. Haematological Oncology

1. Cell cycle – cell kinetics
2. Principles of chemotherapy
3. Oncogenesis
4. Cytogenetics in relation to hematological malignancies
5. Use of growth factors
6. Principles of development of clinical algorithms, etc.

VII. Consultation Haematology Services

1. Hematological complications of pregnancy and the interaction of the pregnant state with disorders of the haemopoietic system.
2. Hematological complications of systemic disease.
3. Hematological problems in Intensive Care Unit patients.
4. Hematological management of neonatal sepsis, hemolytic disease of new born[HDN], alloimmune thrombocytopenia, etc

VIII. Research Methodology and Data Base

1. Clinical Trial Protocol designing.
2. Statistical evaluation & Kaplan-Meyer plot, etc.
3. Bioethics.

Suggested Books for Reading:

1. William's Haematology[Beutler, Lichtman, Coller & Kipps]
2. Wintrobe's Clinical Haematology [Lee, Boggs, Bithell, Foerster, Athens, Lukins]
3. Haematology – Basic Principles & Practice [Hoffman, Benz, Shattil, Furie, Cohen & Silberstein]
4. Blood – [Jandl]
5. Practical Haematology [Dacie & Lewis]
6. Thalassemia Syndromes – [Weatherall & Clegg]
7. Haemostasis & Thrombosis – Basic Principle & Clinical Practice [Coleman , Hirsch, Marder & Salzman]

8. Blood Banking [Mollison]
9. Modern Blood banking & transfusion Practices [Denese M Hannening]
10. Bone Marrow Transplantation. [Forman, Blume & Thomas]
11. The molecular basis of Blood Diseases [Stamatoyannopoulos, Neinhuis, Leder & Majerus].
12. Paediatric Haematology by [Nathan & Ozaskie]

Suggested Journals

1. Blood
2. British J. Hematology
3. Seminars in Haematology
4. Haematology & Oncology Clinics
5. Transfusion
6. Indian J. Hematology & Blood Transfusion
7. Hemostasis & Thrombosis
8. Bone Marrow Transplantation

SECTION – III:

Teaching / Learning Methods And Activities

Throughout the course of training the emphasis shall be on acquiring knowledge, skill and attitudes through first hand experiences as far as possible.

The emphasis will be on self learning rather than on didactic lectures.

The entire period shall be 'in service' training programme based on the concept of 'learn as you work' principle.

The teaching learning activities would consist of –

Participating in rounds – patient management

- 1) Presentation of cases to the faculty with discussion
- 2) Preparation and presentation of P.G. lectures on allotted topics
- 3) Journal clubs
- 3) Clinicopathological exercise by rotation.**

However to reinforce the learning the following methods shall be used to acquire knowledge, skills and attitudes.

1. Lectures prepared and presented by students under supervision.
2. Seminars, symposia, panel discussion of suitable topics, moderated by teachers.
3. Journal clubs moderated by teachers
4. Clinicopathological conferences.
5. Medical audit/fatality case discussion, meetings.
6. Pedagogic training programmes (intramural & extramural)
7. Inter-departmental meetings/discussions of interesting cases

8. Preparation and presentation of a dissertation

9. Patient care work in OPD, wards and dialysis unit.

The students shall be provided facilities to manage cases of higher and greater complexity by allowing them graded responsibility as the course progresses.

Each P.G would have an opportunity to present at least 2 P.G. lectures per year and 8-10 journal clubs per year in addition to about 20-25 cases during the clinical meetings.

They shall also be allowed to perform procedures under supervision and /or delegated authority depending on the experience and proficiency gained.

The Heads of units and other consultants and guides shall be in-charge of the supervision and delegation of authority and responsibility to work.

10. Attend and participate in conference, workshops, field visits, and camps, technical exchange programmes etc., and share knowledge and experience with others.

SECTION –I V

Organization of the course:

Eligibility

Medical graduates will be eligible for selection as follows:

- A. Possession of MBBS from a University recognized by MCI.
[Ordinance 2493, UB]
- B. Possession of MD in General Medicine, Pediatrics, Pathology from a University recognized by the MCI.
[Ordinance 2495, UB] OR
Possession of MNAMS in General Medicine, Pediatrics or Pathology.

[Candidates should have done One year in General Medicine residency or 6 months in Gen. Medicine or Pediatrics and 6 months in a subject allied to Gen. Medicine or Pediatrics.]

Duration

The duration of the training will be for a period of 3 years.
[Ordinance 2496, UB, Mod. 1998]

- ii) Number of students: Each year students will be enrolled maintaining a teacher/students ratio of 1:1
- iii) Duration of course shall be of 3 years after completion of MD or equivalent degree. A minimum of 80% attendance and achievement of satisfactory standards in both theoretical and clinical nephrology would be mandatory before being sent up for the University examination.
- iv) Leave: Residents would be entitled to 30 days leave in the first year and 36 days each in the second and third years of residency.
- v) Rotation:

During the training period.

The resident would be required would be required to rotate through:

- 1) clinical
- 2) laboratory postings as per the curriculum described above
- 3) through allied specialties (pathology, radiology, laboratory medicine etc.)
- 4) Extramural rotations or elective rotations for a maximum period of 2 months will be possible during the 2nd or 3rd year of training.

Departments involved in the Training Programme

- Dr. J. C. Patel Department of Hematology [KEM Hospital]
- Institute of Immunohaematology [ICMR]
- Department of Pathology and Blood bank [KEM Hospital]

Attendance

Since it is a resident in house work as you learn programme, it is desirable that candidates should have 100% attendance to enable this objective to be achieved.

However a minimum of at least 80% attendance would be required before they are allowed to appear for the examination.

LEAVE:

Residents would be entitled to 30 days leave in the first year and 36 days in the 2nd and 3rd year of residency.

Research:

1) Dissertation:

A subject for dissertation would be allotted to the P.G. within the first 6 months after joining.

The emphasis on dissertation work would be on review of literature, maintaining a record of references, preparation of a plan of study, documentation of aims, planning the methodology, collection, documentation and analysis of data, comparison of data obtained with others in literature, drawing conclusions and writing a summary.

The subject of dissertation may be prospective or retrospective. Analysis of less than 25 cases would not be permitted unless it is a rare disease.

The dissertation topics would be discussed in a department meeting prior to completion of 6 months and protocol of study is to be approved by the Department faculty.

4 copies of completed dissertation after appropriate certifications by the guide and co-guide should be submitted at the end of the 2½ years, i.e. 6 months before the final examination (There will therefore be 2 complete years after submission of protocol and the final dissertation)

2) 2 publications in indexed journals would be desirable before appearing for the exam

3) Attend and participate in conference, workshops, field visits, camps, technical exchange programmes etc., and share knowledge and experience with others.

Log (Performance record book)

Maintenance of performance record Log book is mandatory. Certified and assessed copy should be made available at the time of practical examination for review by examiners

Section V

EVALUATION

Evaluation of the Trainee

There will be a continuous assessment and formal examination. Continuous assessment of the practical skills and theoretical knowledge will be carried out during various stages of the training and will be reinforced by maintenance of a log book.

Shall consist of formative and summative assessment.

Formative assessment.

The purpose of continuous course assessment is mainly.

- i) To ensure the habits of regularity, punctuality and disciplined working amongst postgraduates.
- ii) To give periodic feedback regarding their performance for med course correction steps to enhance their learning in various area i.e. patient cares, research teaching, administration etc.
- iii) To monitor attainment of clinical and technical skills to ensure adequacy of training.
- iv) To be available to the internal examiner at the time of final examinations to discount the possibility of a single adverse performance influencing the pass or fail situation by using it to give an idea of the continued performance of the candidate during the three years of training to the external examiners, so that candidates who have otherwise been rated as satisfactory in their internal

evaluation can be given more chances in the final examinations to more questions and overcome the adverse effects of doing badly in any one case. However, internal evaluation marks cannot directly be used for influencing the outcome of the summative assessment in the course of using it to fail a candidate who has otherwise done well in the final examinations or to pass a candidate who has done consistently bad in several cases.

Procedure of formative evaluation.

Formative evaluation will be carried out over 4 activities of the P.G. resident.

(See Annexure)

- 1) Ward work. This will be done by the consultants in the unit concerned at intervals of 6 months.
- 2) Case presentation
- 3) P.G. Lecture
- 4) Journal club
- 5) Theory paper (SAQs) once a year
- 6) General assessment of affective function attitude by medical & paramedical staff.

SUMMATIVE ASSESSMENT

Summative assessment consists of two parts:

Evaluation of thesis/dissertation prepared by the candidates and

Final examination consisting of 4 papers.

Thesis / dissertation

Thesis

The trainee will have to submit a thesis before appearing for the written and practical examination. It will be evaluated by the external examiner appointed for the said examination. Acceptance of the thesis will be a prerequisite for appearing the said examination. **[Ordinance 2498]**

All candidates on admission will be allotted one of the department faculties who have fulfilled the requirement to be guides for purposes of guiding Dissertation/thesis.

The topic for dissertation shall be finalized and discussed in the departmental faculty meeting and allotted to the individual candidates before the completion of 6 months after admission.

The purpose of dissertation is to develop in the candidate the ability to perform an independent study keeping the principles and research methodology in mind. The candidate will therefore work on the prospective problem either within the department or in collaboration with other departments.

There will be continuous monitoring of the dissertation work by the guides and co-guides and by the other department staff throughout the course. The candidate will present the progress of the dissertation to the faculty on the completion of 1 ½ years for monitoring and feed back. The completed dissertation should be submitted no later than 6 months before final examination.

The dissertation shall be evaluated independently by the internal examiners and two external examiners under the following heading:

- 1) Approved
- 2) Not approved

In all cases the approval shall be given before 3 months of the date of appearing for the examination and this will be essential before the candidate is allowed to appear for the written examination.

Eligibility of appearing for final examinations:

Every candidate presenting himself for the DM degree examination shall submit to the Registrar, together with his application for admission to the examination, the following certificates

1. A certificate of his/her having completed under the guidance and to the satisfaction of a recognized teacher or teachers of the course of study in the subjects of the branch in which he/she presents for the examination and a certificate of having acquainted himself with the subjects allied to his speciality and approved by the teacher. ---- satisfactory internal assessment
2. A certificate of having held resident post or full-time post in a recognized institution as required under **ordinance 2496**. --- 80% attendance
3. approval of the examiners for the dissertation / thesis

Examinations: *(As per Direction No. 01/2008 dtd. 26/05/2008)*

Proformas for Internal Evaluation

Evaluation form for Postgraduates Journal Club

Name :

Date :

Points to be considered:

1. Choice of articles
2. Cogency of presentation
3. Whether he has understood the purpose of the article
4. How well did he defend the article
5. Whether cross references have been consulted
6. Whether other relevant publications have been consulted
7. His Overall impression of articles

If good – reasons:

If poor - reasons:

8. Audiovisual aids
9. Response to questioning
10. Overall presentation
11. Others:

Guidance for Scoring:	1	2	3	4	5
	Poor	Below Avg.	Average	Above Avg.	Very Good

Score : ()

Signature :

Log (Performance record book)

Maintenance of performance record Log book is mandatory. Certified and assessed copy should be made available at the time of practical examination for review by examiners

Log Book should contain:

- 1) Certificate duly signed by teacher, head of department, – stating – Dr.....
... Has worked in department from ---- to ---- for a period of 3 years. This Performance record book contain authentic record of work done and Assessment for last 3 years.
- 2) Record of training

Name of the trainee

Hospital

Training period

Name of teacher

- 3) Posting in hematology
- 4) Working schedule
- 5) Teaching programme

6) Journal club

Date	Article	Name of Year vol-	Assessment by faculty Journal Signature	Score / grading (1-5)
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7) Seminars

Date	Topic / Subject	Assessment by faculty Signature
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8) Case presentations:

Date	Case	Teacher's signature Assessment score
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16) Teaching activity

Date	Topic	Class
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17) Participation in Research Activity

Name of project	Duration
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18) Conferences / Workshop attended paper presentation / Publications