Passed by Academic Council (Resolution No. 355/2006) dtd. 30/05/2006, subject to Uniformity in the Examination pattern.

Branch : Oncology

Syllabus for DM [Oncology]

Under the auspices of Maharashtra University of Health Sciences, Nashik

Objectives

The following objectives are laid out to achieve the goals of the course. These objectives are to be achieved by the time the candidate completes the course. The Objectives may be considered under the subheadings

Knowledge (Cognitive domain)
Skills (psycho motor domain)
Human values, Ethical practice and Communication abilities

KNOWLEDGE

- Describe etiology, patho-physiology, principles of diagnosis and management of malignancies including emergencies, in adults and children.
- Describe indications and methods for blood transfusion and pheresis.
- Demonstrate understanding of basic sciences relevant to this specialty
- Identify socio-economic, environmental and emotional determinants in a given case, and take them into account for planning therapeutic measures.
- Recognize conditions that may be outside the area of his specialty/competence and to interact with other disciplines.
- Update oneself by self-study and by attending courses, conferences and seminars relevant to the specialty.
- Teach and guide his team, colleagues and other students.
- Undertake audit.
- Use information technology tools and carry out research, both basic and clinical, with the aim of publishing his work and presenting his work at various scientific forums.

SKILLS

- Take a proper clinical history, examine the patient, perform essential diagnostic procedures and order relevant tests and interpret them to come to a reasonable diagnosis & staging of disease.
- Perform common procedures relevant to the specialty.
- Undertake complete monitoring of the patient.

ATTITUDE AND COMMUNICATION ABILITIES

- Adopt ethical principles in all aspects of his/her practice. Professional honesty and integrity are to be fostered. Care is to be delivered irrespective of the social status, caste, creed or religion of the patient.
- Develop communication skills, in particular the skill to explain various options available in management and to obtain a true informed consent from the patient & breaking of bad news.
- Provide leadership and get the best out of his team in a congenital working atmosphere.
- Apply high moral and ethical standards while carrying out human or animal research.
- Be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues when needed.
- Respect patient's rights and privileges including patient's right to information and right to seek a second opinion.

Eligibility

Medical graduates will be eligible for selection as follows :

A. Possession of MBBS from a University recognized by MCI.

B. Possession of MD in General Medicine or Pediatrics from a University recognized by the MCI.

OR

Possession of MNAMS/DNB in General Medicine or Pediatrics

[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.

Departments involved in the Training Programme

- Department of Medical Oncology, Tata Memorial Hospital

Curriculum

I. Practical Laboratory Training

A. General Hematology and Oncology

1. Proper use and care of common instruments such as light microscope, centrifuge, water baths, freezers etc.
2. Blood sample collection - venepuncture and finger prick methods of sample collection, types of anticoagulants, containers and the effects of delay in processing and storage.
3. Review of normal and abnormal blood films with emphasis on morphology of red cells, white cells and platelets.
4. Performance of bone marrow aspiration; trephine needle biopsy
5. Staining and diagnostic evaluation of bone marrow aspirates. Interpretation of cytochemical stains including Sudan Black, Myleloperoxidase, specific and non specific esterases, acid phosphatase, PAS and iron staining.

B. Cytogenetics

Familiarisation with cytogenetics, understanding the principles of cytogenetics and appreciating the relevance and significance of chromosomes in diagnostic hematology and oncology

C. Transfusion Medicine

1. Donor evaluation & recruitment.
2. Clinical evaluation and screening of patients and donors for hematopoietic stem cell transplantation.
3. Phlebotomy of donors.
4. Collection, cryopreservation and storage of hematopoietic stem cells.

D. Flow Cytometery

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

E. Molecular Biology Module

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

1. PCR
2. FISH
3. RFLP and Southern Blotting.
4. Microarray technology

II. Clinical Oncology Training

With appropriate guidance and under supervision, the post graduate trainee will be responsible primarily for the acquisition of knowledge in all areas of oncology. 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 various oncology services. Faculty will also be involved in teaching of trainees in the ward-rounds and outpatient clinics.

COURSE CONTENTS

CANCER BIOLOGY

Molecular Biology

Cell Proliferation, Differentiation, and Apoptosis

Growth Factor Signal Transduction in Cancer

Oncogenes

Tumor Suppressor Gene Defects in

Recurring Chromosome Rearrangements in Human Cancer

Biochemistry of Cancer

Invasion and Metastases

Tumor Angiogenesis

TUMOR IMMUNOLOGY

Tumor Immunology

CANCER ETIOLOGY

Genetic Predisposition to Cancer

Chemical Carcinogenesis

Hormones and the Etiology of Cancer

Ionizing Radiation

Ultraviolet Radiation Carcinogenesis

Physical Carcinogens

Trauma and Inflammation

Tumor Viruses

Herpesviruses

Papillomaviruses and Cervical Neoplasia

Hepatitis Viruses

Parasites

CANCER EPIDEMIOLOGY

Cancer Epidemiology

THEORY AND PRACTICE OF CLINICAL TRIALS

Theory and Practice of Clinical Trials

CANCER PREVENTION

Prevention of Tobacco-Related Cancers

Nutrition in the Etiology and Prevention of Cancer

Chemo-prevention of Cancer

Cytokinetics

Drug Resistance and its Clinical Circumvention

Principles of Dose, Schedule, and Combination

Chemotherapy

Regional Chemotherapy

Animal Models in Developmental Therapeutics

In Vitro and In Vivo Predictive Tests

Pharmacology

Toxicology by Organ System

CHEMOTHERAPEUTIC AGENTS

Folate Antagonists

Pyrimidine and Purine Antimetabolites

Alkylating Agents and Platinum Antitumor Compounds

Anthracyclines and DNA Intercalators /

Epipodophyllotoxins / DNA Topoisomerases

Microtubule-Targeting Anticancer Drugs Derived from Plants and Microbes: *Vinca*

Alkaloids, Taxanes, and Epothilones, Asparaginase

PRINCIPLES OF ENDOCRINE THERAPY

Steroid Hormone Binding and Hormone Receptors

Hypothalamic and Other Peptide Hormones

Corticosteroids

Estrogens and Antiestrogens

Clinical Use of Aromatase Inhibitors in Breast Carcinoma

Progestins

Androgen Deprivation Strategies in the Treatment of Advanced Prostate Cancer

CANCER SCREENING AND EARLY DETECTION

Cancer Screening and Early Detection

PRINCIPLES OF CANCER PATHOLOGY

Principles of Cancer Pathology

PRINCIPLES OF IMAGING

a. Imaging Cancer of Unknown Primary Site

b. Imaging Neoplasms of the Head and Neck and Central

Nervous System

c. Imaging Neoplasms of the Thorax

d. Imaging Neoplasms of the Abdomen and Pelvis

e. Cross-Sectional Imaging of Musculoskeletal

Neoplasms

f. Imaging the Breast

g. Ultrasound in Cancer Medicine

h. Radionuclide Imaging in Cancer Medicine

i. Perspectives in Imaging

Interventional Radiology for the Cancer Patient

PRINCIPLES OF SURGICAL ONCOLOGY

Principles of Surgical Oncology

Vascular Access in Cancer Patients

PRINCIPLES OF RADIATION ONCOLOGY

Physical and Biologic Basis of Radiation Oncology

Principles of Hyperthermia

Photodynamic Therapy of Cancer

PRINCIPLES OF MEDICAL ONCOLOGY

Principles of Medical Oncology

PRINCIPLES OF BIOTHERAPEUTICS

Immunostimulants

Active Specific Immunotherapy with Vaccines

Interferons

Cytokines: Biology and Applications in Cancer Medicine

Hematopoietic Growth Factors .

Monoclonal Serotherapy

Cancer Gene Therapy

PRINCIPLES OF BONE MARROW TRANSPLANTATION

Autologous Bone Marrow and Stem Cell Transplantation

Transplantation of Allogeneic Hematopoietic Cells for the Treatment of Malignancies

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.

3. Transplantation immunology

   Histocompatibility, graft versus host disease – diagnosis and management. Immune reconstitution following transplantation.

4. Management of post transplant patient

PRINCIPLES OF PSYCHO-ONCOLOGY

PRINCIPLES OF ONCOLOGY NURSING

Principles of Oncology Nursing

PRINCIPLES OF CANCER REHABILITATION MEDICINE

Principles of Cancer Rehabilitation Medicine

PRINCIPLES OF MULTIDISCIPLINARY MANAGEMENT

Principles of Multidisciplinary Management Palliative Care

PRINCIPLES OF SOCIETAL ONCOLOGY

Ethical Aspects of Caring for Patients with Cancer

Legal Aspects of Cancer

The Government and Cancer Medicine

Clinical Oncology in a Changing Health Care Environment

Outcomes Assessment

NEOPLASMS OF THE CENTRAL NERVOUS SYSTEM

Neoplasms of the Central Nervous System

NEOPLASMS OF THE EYE

Neoplasms of the Eye

NEOPLASMS OF THE ENDOCRINE GLANDS

Pituitary Neoplasms

Neoplasms of the Thyroid

Neoplasms of the Adrenal Cortex

Neoplasms of the Neuroendocrine System and

Neoplasms of the Gastroenteropancreatic

Endocrine System

NEOPLASMS OF THE HEAD AND NECK

Head and Neck Cancer

Odontogenic Tumors

NEOPLASMS OF THE THORAX

Cancer of the Lung

Malignant Mesothelioma

Thymomas and Thymic Tumors

NEOPLASMS OF THE FEMALE

REPRODUCTIVE ORGANS

Neoplasms of the Vulva and Vagina

Neoplasms of the Cervix

Endometrial Cancer

Neoplasms of the Fallopian Tube

Ovarian Cancer

Gestational Trophoblastic Disease

Gynecologic

NEOPLASMS OF THE BREAST

Neoplasms of the Breast

NEOPLASMS OF THE SKIN

Neoplasms of the Skin

MALIGNANT MELANOMA

Malignant Melanoma

NEOPLASMS OF THE BONE AND

SOFT TISSUE

Bone Tumors & Sarcomas of Non-osseous Tissues

NEOPLASMS OF THE HEMATOPOIETIC

SYSTEM

Myelodysplastic Syndrome

Acute Myeloid Leukemia in Adults

Chronic Myeloid Leukemia

Acute Lymphocytic Leukemia in Adults

Chronic Lymphocytic Leukemia

Tumors of the Heart and Great Vessels

Primary Germ Cell Tumors of the Thorax

Metastatic Tumors in the Thorax

Hairy-Cell Leukemia

Hodgkin's Disease

Non–Hodgkin's Lymphomas

Mycosis Fungoides and the Sézary Syndrome

Plasma Cell Tumors

Mast Cell Leukemia and Other Mast Cell Neoplasms

Polycythemia Vera and Essential Thrombocythemia

NEOPLASMS OF THE ALIMENTARY CANAL

Neoplasms of the Esophagus

Neoplasms of the Stomach

Primary Neoplasms of the Liver

Treatment of Liver Metastases

The Gallbladder

Diagnosis and Management of Biliary Tract Cancer

Neoplasms of the Ampulla of Vater

Neoplasms of the Exocrine Pancreas

Neoplasms of the Small Intestine, Vermiform

Appendix,and Peritoneum

Adenocarcinoma of the Colon and Rectum

Neoplasms of the Anus

NEOPLASMS OF THE GENITOURINARY TRACT

Renal Cell Carcinoma

Neoplasms of the Renal Pelvis and Ureter

Bladder Cancer

Neoplasms of the Prostate

Neoplasms of the Penis

Neoplasms of the Testis

NEOPLASMS IN AIDS

Neoplasms in Acquired Immunodeficiency Syndrome

NEOPLASMS OF UNKNOWN PRIMARY SITE

Neoplasms of Unknown Primary Site

NEOPLASMS IN CHILDREN

a. Principles and Practice of Pediatric Oncology

b. Incidence, Origins, Epidemiology

c. Principles of Pediatric Radiation Oncology

d. Late Effects of Treatment of Cancer in Children and Adolescents

a. Childhood Acute Lymphoblastic Leukemia

b. Pediatric Acute Myeloid Leukemia

c. Hodgkin's Disease in Children and Adolescents

d. Non-Hodgkin's Lymphoma in Children

e. Langerhans' Cell Histiocytosis

a. Hepatic Tumors

b. Renal Tumors of Childhood

c. Germ Cell Tumors

d. Neuroblastoma

e. Soft Tissue Sarcomas of Childhood

COMPLICATIONS OF CANCER AND ITS TREATMENT

Management of Cancer Pain

Anorexia and Cachexia

Antiemetic Therapy

Neurologic Complications

Dermatologic Complications of

Cancer Chemotherapy

Skeletal Complications

Hematologic Complications and

Blood Bank Support

Coagulopathic Complications of Cancer

Urologic Complications

Cardiac Complications

Respiratory Complications

Liver Function and Hepatotoxicity in Cancer

Gastrointestinal Complications

Oral Complications

Gonadal Complications

Endocrine Complications

Secondary Cancers: Incidence,

Risk Factors, and Management,

INFECTIONS IN PATIENTS WITH CANCER

Infections in Patients with Cancer

ONCOLOGIC EMERGENCIES

Oncologic Emergencies

RECOMMENDED BOOKS & JOURNALS

JOURNALS

American Journal of Paediatrics

1. Acta Oncologica
2. Haematology/Oncology
3. British Journal of Cancer
4. Cancer
5. CA.A Cancer Journal for Clinicians
6. Cancer Detection & Prevention
7. Cancer Genetics and Cytogenetics
8. Cancer Journal (Scientific American) (NP)
9. Cancer Survey (NP)
10. Cancer Treatment Review
11. Clinical Oncology
12. Current Problem in Cancer
13. Current Opinion in Oncology
14. European Journal of Cancer
15. European Journal of Surgical Oncology
16. Genes, Chromosomes and Cancer
17. Gynecologic Oncology
18. Haematological Oncology
19. Haematology Oncology Clinics of North America
20. Indian Journal of Cancer (Indian)
21. International Journal of Cancer (UICC)
22. International Journal of Gynecological Cancer
23. International Journal of Radiation Oncology Biology/Physics
24. Journal of Cancer Education (NP)
25. Journal of Clinical Oncology
26. Journal of National Cancer Institute (Gift)

27.Journal of Psycho social Oncology
28.Journal of Surgical Oncology
29.Medical & Paediatric Oncology
30.Nutriton and Cancer
31.Oncology (NP)
32.Psycho-Oncology
33.Radiotherapy & Oncology
34.Seminars in Oncology
35.Seminars in Oncology Nursing
36.Seminars in Radiation Oncology
37.Seminars in Surgical Oncology
38.Surgical Oncology Clinics of North America
39.Blood
40.British J. Hematology
41.Seminars in Haematology
42.Haematology & Oncology Clinics
43.Bone Marrow Transplantation

BOOKS FOR READING (LATEST EDITION)

- Molecular Diagnosis of Cancer , COTTER.F.E.
- Molecular Biology for Oncologists ,YARNOLD..J.R. et al
- Cancer Chemotherapy Handbook, BAQUIRANJ DELIA~
- The Lymphomas, CANELLOS,G.P.et al
- Chemotherapy source book, PERRY,M.C,
- Leukemia, HENDERSON,E.S.et al
- Cancer Medicine, HOLLAND, J .F. et al.
- Atlas of clinical Haematology, BEGEMANN
- Text book of Malignant Haematology, Degos.L et al
- Clinical Haematology, ROCHARD Lee. et al
- Clinical Oncology, ABELOFF et al

- Important Advances *in* Oncology, .DEVITA, V.T.
- Cancer Principles and Practice of Oncology, DEVITA , V. T. et al,
- Decision Making *in O*ncology Evidence Based Management, . DJULBEGOVIC. B & SULLIVAN.
- AJCC Cancer' Staging Manual (American Joint Committee on Cancer Cancer Treatment, HALNAN E .K
- Cancer' Treatment, HASKEL
- Oncology for' Palliative Medicine, HOSKIN PETER & MAKING WENDY)
- Regional Therapy of Advanced Cancer, RUBIN,J.T
- MAGRATH, I. The Non-Hodgkin's Lymphoma,
- Comprehensive Text book of Oncology, Vol 1-2,.MOSSA, A.R
- Oxford textbook of Oncology PECKHAM, M. et al I
- A Multi-disciplinary Approach for Physicians and Students, RUBIN Clinical Oncology.
- Atlas of diagnostic oncology, SKARIN, A.T
- *Basic* Science of Oncology, TANNOCK,E.I
- Pediatric oncology ,Philip LANSZOWSKY
- William's Haematology[Beutler, Lichtman, Coller & Kipps]
- Wintrobe's Clinical Haematology [Greer et al]
- Haematology – Basic Principles & Practice [Hoffman, Benz, Shattil, Furie, Cohen & Silberstein]
- Practical Haematology [Dacie & Lewis]
- Bone Marrow Transplantation. [Forman, Blume & Thomas]
- Clinical bone marrow and blood stem cell transplantation [Atkinson et al]
- The molecular basis of Blood Diseases [Stamatoyannopoulos, Neinhuis, Leder & Majerus].
- Paediatric Haematology by [Nathan & Ozaskie]

F. Research Methodology and Data Base

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

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. The candidate will be guided and judged as regards his/her abilities to provide competent care to his patients through various means like ward rounds, discussions held in OPD and weekly academic activities. Internal examination in the form of written examination will be held every year in the month of August with an objective type of questionnaire.

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]**

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 subject s of the branch in which he/she presents for the examination and a certificate of having acquainted himself with the subjects allied to his specialty and approved by the teacher.

2. A certificate of having held resident post or full-time post in a recognized institution.

Examinations

(***As per Direction No. 01/2008 dtd. 26/05/2008 & practical scheme is as per revised practical marksheet.)***