

DM IN MEDICAL ONCOLOGY

I. GOALS:

DM (Medical oncology) course is designed to train the candidates in the principles and practice of advanced medical oncology, to equip them to function as faculty /consultants and researcher in medical oncology.

II. 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.

1. Knowledge
2. Skills
3. Human values, ethical practice and communication abilities.

1. KNOWLEDGE:

1. To train doctors in the scientific aspects of the specialty of medical oncology.
2. To empower them to practice the specialty of medical oncology with competence, care and compassion there by delivering highest standard of medical oncology care to the community.
3. To empower the trainee in academic and research aspect of medical oncology, to empower the trainee to become an effective teacher and communicator in medical oncology.
4. To establish the required training methods, evaluation methodology and qualifying norms for the successful completion of the DM Course in Medical oncology.
5. To provide the candidate with the current, latest, and scientific and evidence based knowledge pertaining to the above mentioned areas in Medical oncology.

2. Skills:

1. To impart the skill to undertake independent clinical practice in the areas of medical oncology and provide opportunities to the practice of skills in a graded manner and under suitable supervision to a point where the candidate is capable of practicing these skills independently.
2. To inculcate in the candidate an attitude of responsibility, accountability and caring, to empower the candidate with a good and sound foundation of ethical values in the practice of medical oncology; and to develop in the candidate the ability to effectively communicate with patients, peers, superiors, and the community in the discharge of his/her clinical and research role.

3. Human values, Ethical Practice and Communication Abilities:

- ✚ Adopt ethical principles in all aspects of his/her practice; professional hone and integrity are to be fostered. Care is to be delivered irrespective of 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 patient.
- ✚ Provide leadership and get the best out of his/ her team in a congenial work atmosphere.
- ✚ Apply high moral and ethical standard while carrying out human or animal research.
- ✚ Be humble and accept the limitations in his knowledge and skill and to seek 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.

I **III. COURSE CONTENTS:**

REGULATION:

PART ONE:

MOLECULAR BIOLOGY OF CANCER.

1. The Cancer Genome
2. Mechanisms of Genomic Instability
3. Epigenetics of Cancer
4. Telomeres, Telomerase, and Cancer
5. Cell Signaling Growth Factors and Their Receptors
6. Cell Cycle
7. Mechanisms of Cell Death
8. Cancer Metabolism
9. Angiogenesis
10. Invasion and Metastasis
11. Cancer Stem Cells
12. Biology of Personalized Cancer Medicine

PART TWO:

ETIOLOGY AND EPIDEMIOLOGY OF CANCER.

Section 1: Etiology of Cancer.

13. Tobacco
 14. Cancer Susceptibility Syndromes
 15. DNA Viruses
 16. RNA Viruses
 17. Inflammation
 18. Chemical Factors
 19. Physical Factors
 20. Dietary Factors
 21. Obesity and Physical Activity
- ##### **Section 2: Epidemiology of Cancer**
22. Epidemiologic Methods
 23. Global Cancer Incidence and Mortality
 24. Trends in cancer Mortality

PART THREE:

PRINCIPLES OF CANCER TREATMENT

25. Medical oncology: General Issues
26. Surgical Oncology
27. Radiation Oncology

28. Medical Oncology
29. Assessment of Clinical Response
30. Cancer Immunotherapy
31. Health Services Research and Economics of Cancer Care

PART FOUR:

PHARMACOLOGY OF CANCER THERAPEUTICS.

Section 1: Chemotherapy Agents

32. Pharmacokinetics and Pharmacodynamics
33. Pharmacogenomics
34. Alkylating Agents
35. Platinum Analogs
36. Antimetabolites
37. Topoisomerase Interacting Agents
38. Ant microtubule Agents
39. Targeted Therapy with Small Molecule Kinase Inhibitors
40. Histone Deacetylase Inhibitors and Demethylating Agents
41. Proteasome Inhibitors
42. Poly (ADP-Ribose) Polymerase Inhibitors
43. Miscellaneous Chemotherapeutic Agents

Section 2: Bio therapeutics

- 44. Interferon's
- 45. Interleukin Therapy
- 46. Antisense Agents
- 47. Ant angiogenesis Agents
- 48. Monoclonal Antibodies
- 49. Endocrine Manipulation

PART FIVE:

CANCER PREVENTION

- 50. Preventive Cancer Vaccine
- 51. Tobacco Dependence and its Treatment
- 52. Role of Surgery in Cancer Prevention
- 53. Principles of Cancer Risk Reduction Intervention
- 54. Retinoid, Carotenoids, and Other Micronutrients in Cancer Prevention
- 55. Drugs and Nutritional Extracts for Cancer Risk reduction
(Chemoprevention)

PART SIX:

CANCER SCREENING

- 56. Principles of Cancer Screening
- 57. Early Detection Using Proteomics
- 58. Screening for Gastrointestinal Cancer
- 59. Screening for Gynecologic Cancer
- 60. Screening for Breast Cancer
- 61. Screening for Prostate Cancer
- 62. Screening for Lung Cancer
- 63. Genetic Counselling

PART SEVEN:

**SPECIALIZED TECHNIQUES IN
CANCER MANAGEMENT**

- 64. Vascular Access and Specialized
- 65. Interventional Radiology
- 66. Functional Imaging
- 67. Molecular Imaging
- 68. Photodynamic Therapy
- 69. Biomarkers

PART EIGHT:

PRACTICE OF ONCOLOGY

- 70. Design and Analysis of Clinical Trails

Section 1: Cancer of the Head and Neck

- 71. Molecular Biology of Head and neck Cancers

- 72. Treatment of Head and Neck Cancer
- 73. Rehabilitation after Treatment of Head and Neck Cancer

Section 2: Cancer of the Thoracic Cancer

- 74. Molecular Biology of Lungs Cancer
- 75. Non – Small Cell Lung Cancer
- 76. Small Cell and Neuroendocrine Tumors of the Lungs
- 77. Neoplasms of the Mediastinum

Section 3: Cancer of the Gastrointestinal Tract

- 78. Molecular Biology of the Esophagus and Stomach
- 79. Cancer of the Esophagus
- 80. Cancer of the Stomach
- 81. Molecular Biology of Pancreas Cancer
- 82. Cancer of the Pancreas
- 83. Molecular Biology of Liver Cancer
- 84. Cancer of the Liver
- 85. Cancer of the Biliary Tree
- 86. Cancer of the Small Intestine
- 87. Gastrointestinal Stromal Tumor
- 88. Molecular Biology of Colorectal Cancer
- 89. Cancer of the colon
- 90. Cancer of the Rectum
- 91. Cancer of the Anal Region

Section 4: Cancer of the Genitourinary System

- 92. Molecular Biology of Kidney Cancer
- 93. Cancer of the Kidney
- 94. Molecular Biology of Bladder Cancer
- 95. Cancer of the Bladder, Ureter and Renal pelvis
- 96. Molecular Biology of Prostate Cancer
- 97. Cancer of the Prostate
- 98. Cancer of the Urethra and Penis
- 99. Cancer of the Testis

Section 5: Gynecology Cancers

- 100 Molecular Biology of Gynecologic Cancers
- 101 Cancer of the Cervix, Vagina and Vulva
- 102 Cancer of the Uterine Body
- 103. Gestational Trophoblastic Neoplasms
- 104. Ovarian Cancer, Fallopian Tube Carcinoma and peritoneal Carcinoma

Section 6: Cancer of the Breast

- 105 Molecular Biology of breast Cancer
- 106 Malignant Tumors of the Breast

Section 7: Cancer of the Endocrine System

107. Molecular Biology of Endocrine Tumors

108. Thyroid Tumors

109. Parathyroid Tumors

110. Adrenal Tumors

111. Pancreatic Neuroendocrine Tumors

112. Neuroendocrine (Carcinoid) Tumors and the Carcinoid Syndrome

113 Multiple Endocrine Neoplasias

Section 8: Sarcomas of Soft Tissue and Bone

114. Molecular Biology of soft Tissue Sarcoma

115. Soft Tissue Sarcoma

116. Sarcomas of Bone

Section 9: Cancer of the skin

117. Cancer of the skin

118. Molecular Biology of Cutaneous Melanoma

119. Cutaneous Melanoma.

Section10: Neoplasms of the Central Nervous System

120. Molecular Biology of Central Nervous System Tumors

121. Neoplasms of the Central Nervous System.

Section 11: Cancers of Childhood

122. Molecular Biology of Childhood Cancers

123. Solid Tumors of Childhood

124. Leukemia's and Lymphomas of Childhood126. Hodgkin Lymphoma

127. Non –Hodgkin Lymphomas

128. Cutaneous Lymphomas

129. Primary Central Nervous System Lymphoma

Section 13: Leukemias and plasma cell Tumors

130. Molecular Biology of Acute Leukemias

131. Management of Acute Leukemias

132. Molecular Biology of Chronic

133. Chronic Myelogenous Leukemia

134. Chronic Lymphocytic Leukemias

135. Myelodysplastic Syndromes

136. Plasma Cell Neoplasms

137. Cancer of Unknown Primary Site

138. Benign and Malignant Mesothelioma

139. Peritoneal Surface Malignancy

140. Intraocular Melanoma

Section 15: Immunosuppression- Related Malignancies

141. AIDS –Related Malignancies

142. Transplantation –Related Malignancies

Section 16: Oncologic Emergencies

143. Superior Vena Cava Syndrome

144. Increased Intracranial Pressure

145. Spinal Cord Compression

146. Metabolic Emergencies

Section 17: Treatment of Metastatic Cancer

147. Metastatic Cancer to the Brain

148. Metastatic Cancer to the Lung

149. Metastatic Cancer to the Liver

150. Metastatic Cancer to the Bone

151. Malignant Effusions of the Pleura and the Pericardium

152. Malignant Ascites

153. Para neoplastic Syndromes

Section 18: Stem Cell Transplantation

154. Autologous Stem Cell Transplantation

155. Allogeneic Stem Cell Transplantation

Section 19: Management of Adverse Effects of Treatment

156. Infections in the Cancer Patient

157. Leukopenia and Thrombocytopenia

158. Cancer-Associated Thrombosis

159. Diarrhea and Constipation

160. Diarrhea and Constipation

161. Oral Complication

162. Pulmonary Toxicity

163. Cardiac Toxicity

164. Hair Loss

165. Gonadal Dysfunction

166. Fatigue

167. Second Primary Cancer

168. Neurocognitive Effects

169. Cancer Survivorship

Section 20: Supportive Care and Quality of Life

170. Management of Cancer Pain

171. Nutritional Support

172. Sexual Problems

173. Psychological Issues in Cancer

174. Communicating News to the Cancer

175. Specialized Care of the Terminally Ill

176. Community Resources

177. Rehabilitation of the Cancer Patient

Section 21: Societal Issues in Oncology

178. Regulatory Issues

179. Health Disparities Cancer

180. Cancer Information on the Internet

Section 22: Complementary, Alternative and Integrative Therapies

181. Complementary, Alternative, and Integrative Therapies in Cancer care

The postgraduates will be sensitized to regulations under different statutory Councils, such as the Medical Council of the India Act, The Code of Medical Ethics, Transplantation of Human Organs Act, etc. They will also be familiarized with other legislation /Act, that affect the practice of Clinical Medicine (like the Consumer protection Act, The Drugs and Cosmetics Act, The Medical Termination of Pregnancy Act, The Narcotics and Psychotropic Substances Control Act,etc.)

Teaching and Learning Activities: A) Theoretical Teaching:

1) Lectures: Lectures are to be kept to be minimum .Certain selected topics can be taken as lectures .Lectures may be didactic or integrated.

2) Journal Club: Recommended to be held once a week .All the PG students are expected to attend and actively participate in discussion and enter in the Log Book the relevant details. The presentations would be evaluated using check list and would carry weightage for internal assessment. A time table with names of the students and the moderator should be announced in advance.

3) Subject Seminar: Recommended to be held once week .All the PG students are expected to attend and actively participate in discussion and enter in the Log book relevant details .The presentations would be evaluated using check lists and would carry weightage for internal assessment. A timetable for the subject with names of the students and moderator should be announced in advance.

4) Case Discussion : Recommended to be held once a week .All the PG students are expected to attend and actively participate in discussion and enter in the Log Book relevant details .The presentations would be evaluated using check lists and would carry weightage for internal assessment. A timetable for the ,case presentation with names of the students should be announced in advance

5) Wards Rounds: Wards rounds may be service or teaching rounds.

a) Service Rounds : Postgraduate students should do service rounds every day for the care of the patients .Newly admitted patients should be worked up by

the post graduate student and presented to the faculty members the following day.

b) Teaching Rounds: Every unit should have grand rounds for teaching purpose at the bed side .A diary should be maintained for day-to-day activities by the post-graduate students.

Entries of (a) and (b) should be made in the Log Book.

6) Clinico-Pathological Conference: Recommended once a month for all post graduate students. Presentation to be done by rotation . Presentation will be assessed using check list, if case are not available due to lack of clinical postmortems, it could be supplemented by published CPCs.

7) Inter Departmental Meetings: Strongly recommended particularly with related departments

like Radiation Oncology, Medical Oncology, Pathology and Radiology at least once a month .These meetings should be attended by post-graduate students and relevant entries must be made in the Log Book.

8) Mortality Meeting: The mortality meeting should be conducted in the department every month. The post graduate student should prepare the detail, and should present during the mortality meeting. The death records will be discussed in detail during this meeting.

9) Teaching Skills: Post-graduate students must teach under graduate students (eg. Medical, Nursing) by taking demonstrations, bedside clinics, tutorials, lectures etc. Assessment is made using a checklist by medical faculty as well as by the students. Record of their participation is to be kept in Log Book. Training of postgraduate students in Educational Science and Technology is recommended.

10) Continuing Medical Education Programmes (CME): Recommended that at least one national and state level CME programme should be attended by each student during the course.

11) Conferences: Attending conference is compulsory. Post-graduate student should attend at least one national and one state level conference during the course.

12) Research Activities:

The Candidate shall furnish proof of having undertaken the original research work of high order. The research work shall be performed by the student during his/her study under the supervision of the post graduate teacher. This work shall be submitted to the university six months prior to the date of final examination as a proof of his research work.

And

The candidate shall publish at least one research paper in peer review indexed journal. In addition, the candidates shall present at least two research paper/poster in a conference at National or International Level.

Activities to be performed by the PG students during the course period:

a. Subject Seminar : 12

b. Journal Club : 72

c. Bedside Clinics/General Clinics : 72

d .Mortality Meeting :12

e. Under Graduate Lectures :15

B. Clinical/Practical training

Recent Advances in Medical oncology (including other emerging topics related to Medical oncology)

The broad objectives set out above are to be achieved through assumption of graded responsibility in patient care and operative work.

OPD procedure:

The candidate will familiarize himself / herself with the different diagnostic procedures in Medical oncology such as punch biopsy, Tru-cut biopsy, Lumbar puncture, Bone marrow aspiration and biopsy, Central line insertion, chemoport flush, Intrathecal chemotherapy etc, whenever feasible.

Rotation and posting to other Departments:

During the training period of 3 years of the course the students shall be in communication and discussion with consultants and professional colleagues of other departments allied to the specialty e.g. Surgical Oncology, Radiation Oncology, Pathology, and Radiology

v. Other Criteria to be fulfilled for the Degree Course:

1. Internal evaluation:

During the course of three years, the departments will conduct two tests. Both of them will be annual, one at the end of first year and other at the end of second year. The test may include the written papers, clinical and viva-voce. Records and marks obtained in such test will be maintained by the head of the department and will be sent to the university when called for.

The annual test at the end of first year shall consist of basic Oncology subjects. Results of all evaluations should be entered into log book and departmental file for documentation purpose. Main purpose of periodic examination and accountability is to ensure clinical expertise of the students with practical and communication skills and balance broader concept of diagnostic and therapeutic challenges.

2. Maintenance of log book:

Every candidate shall maintain a log book / work diary and record his/ her participation in the training programmes conducted by the departments such as journal reviews, seminars, etc. . Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory, procedures, if any conducted by the candidate. All the Procedures performed

by the post graduate students should be entered in the log book. All the activities including the ward rounds and the routine procedures performed on the day to day basis should be entered in the log book and it should be verified and signed by the faculty member. The log book shall be scrutinized and certified by the head of the department and head of the Institution and presented in the University and during clinical examination
And

Every candidate shall do the dissertation as a part of DM Curriculum under the guidance of post Graduate Teacher. It should be submitted 6 months before exams this thesis will be sent to external experts for their approval.

VI. SCHEME OF EXAMINATION:

Candidates will be allowed to appear for examination only if attendance (Minimum 80%) and internal assessment are satisfactory and research and publication work is satisfactory.

The examination shall consist of theory, clinical; examination and viva voce examination

The examination shall consist of the following parts:

- 1) Theory
- 2) Clinical Examination & viva voce

A. Theory:400 marks

The theory examination shall consist of four papers of hundred marks each and of three hours duration. The format of each paper will be as below:	No. of Question	Marks for each Question	Total Marks
Type of Questions			
Short essay 100	10	10	100

Paper I Basic Sciences as applied to Medical oncology

Paper II Principles and Practice of Medical oncology

Paper III Specialty Medical oncology

Paper IV Recent Advances in Medical oncology

Note: The distributions of topics shown against the papers are suggestive only and may overlap or change.

B. Practical/ Clinical Examination:

Type of case No. of Cases Marks

Long cases 1 100

Short cases 2 100(50x2)

Ward round 2 100(50x2)

C. Viva Voce: 100 Marks:

All examiners will conduct viva- voce conjointly on candidate's comprehension analytical approach, expression and interpretation of data. It includes all components of course content. Student knowledge on use of instruments and drugs will also be evaluated during vivo –voce examination.

D. Distribution of Marks:

Theory	Practical/ Clinical Examination	Viva	Grand Total
400	300	100	800

E. Passing Criterion :

To pass the examination the candidate must secure 50% of the marks in each head of theory and practical separately.

Name of the Book

Authors

Serial no.

1

Abeloff's Clinical Oncology

John E, Niederheuber, James O. Armitage, James H. Doroshow, Micheal B. Kastan, Joel E. Tepper

2

Cancer Principles and Practice of Oncology

Vincent T. DeVita Jr. Theodore S. Lawrence,

Steven A. Rosenberg

3	Principles and Practice of Gynecologic Oncology	Dennis S. Chi, Andrew Burchuk, Don S Dizon, Catharyn Yashar
4	Urologic Oncology	William J. Catalona, Timothy L. Ratliff
5	Thoracic Oncology	David S. Ettinger
6	Textbook of Breast Cancer: A Clinical Guide to therapy	Gianni Bonnadona, Luca Gianni, Gabriel Hortobagyi, Pinuccia Valagussa

7.Principles and practice of pediatric oncology ;Pipzo Poplack

8.Cancer staging handbook ,AJCC

9.Cancer Chemotherapy and Biotherapy :Principles and Practice Bruce A chabner ,Dan L Longo

Journals:

1. Indian Journal of Medical oncology
2. Indian Journal of Medical and Pediatric Oncology
3. Journal of Gynecologic Oncology
4. North American Journal of Medical oncology
5. Journal of Breast Cancer.
- 6.Blood
- 7.Journal of clinical Oncology
- 8.Clinics of North America
- 9.Lancet oncology
- 10.Annals of Oncology
- 11.New England Journal of Medicine