

**THE TAMILNADU DR.M.G.R. MEDICAL UNIVERSITY,
No.69, Anna Salai, Guindy, Chennai – 600 032.**

**D.M/ M.Ch
SUPER SPECIALTY DEGREE COURSE**



SYLLABUS AND CURRICULUM

2017-2018

M.Ch - SURGICAL ONCOLOGY

THE TAMIL NADU Dr. M.G.R. MEDICAL UNIVERSITY, CHENNAI
Syllabus - M.Ch. SURGICAL ONCOLOGY

1 AIMS & OBJECTIVES:

The syllabus of the 3-year MCh Surgical oncology training programme is designed to:

1. Impart knowledge and skills training to a qualified surgeon in all aspects of cancer treatment, so that he becomes competent to treat cancer patients after acquiring the degree.
2. Train him/her in diagnostic and therapeutic procedures including the fundamentals of medical and radiation oncology, basic sciences, cancer prevention, screening, rehabilitation and palliative care so that he/she can provide comprehensive cancer care to the patients.
3. Make him/her an accomplished teacher for training the students.
4. Make him/her well-versed in conducting clinical research and trials in the field of oncology.
5. Enable and encourage the student to publish papers in indexed journals and participate in National and International Meetings/Conferences in the field.

2 .THEORY SYLLABUS:-

SECTION - I - ETIOLOGY OF CANCER

1. THE CANCER GENOME

- Cancer Genes and their Mutations
- Identification of Cancer Genes
- Somatic Alteration Classes Detected by Cancer Genome Analysis
- Pathway-Oriented Models of Cancer Genome Analysis
- Networks of Cancer Genome Projects
- The Genomic Landscape of Cancers
- Integrative Analysis of Cancer Genomics
- The Cancer Genome and the New Taxonomy of Tumors
- Cancer Genomics and Drug Resistance
- Perspectives of Cancer Genome Analysis

2. HALLMARKS OF CANCER: AN ORGANIZING PRINCIPLE FOR CANCER MEDICINE

- Hallmark Capabilities, in Essence

- Two Ubiquitous Characteristics Facilitate the Acquisition of Hallmark Capabilities
- The Constituent Cell Types of the Tumor Microenvironment
- Therapeutic Targeting of the Hallmarks of Cancer
- Conclusion and a Vision for the Future

3. MOLECULAR METHODS IN CANCER

- Applications of Molecular Diagnostics in Oncology
- The Clinical Molecular Diagnostics Laboratory: Rules and Regulations
- Specimen Requirements for Molecular Diagnostics
- Molecular Diagnostics Testing Process
- Technologies

4. TOBACCO

- Epidemiology of Tobacco and Cancer
- Carcinogens in Tobacco Products and Processes of Cancer Development

5. ONCOGENIC VIRUSES

- Principles of Tumor Virology
- Papillomaviruses
- Polyomaviruses
- Epstein-Barr Virus
- Kaposi's Sarcoma Herpesvirus
- Animal and Human Retroviruses
- Hepatitis Viruses

6. INFLAMMATION

- Molecular Basis of Inflammation
- Role of Inflammation in Transformation
- Role of Inflammation in Survival
- Role of Inflammation in Proliferation
- Role of Inflammation in Invasion
- Role of Inflammation in Angiogenesis
- Role of Inflammation in Metastasis
- Epigenetic Changes and Inflammation
- Role of Inflammation in Cancer Diagnosis
- Inflammation and Genomics
- Inflammation and Targeted Therapies

7. CHEMICAL FACTORS

- The Nature of Chemical Carcinogens: Chemistry and Metabolism
- Animal Model Systems and Chemical Carcinogenesis
- Molecular Epidemiology, Chemical Carcinogenesis, and Cancer Risk in Human Populations
- Aristolochic Acid and Urothelial Cancers as a Model for Identifying Human Carcinogens

8. PHYSICAL FACTORS

- Ionizing Radiation
- Ultraviolet Light
- Radiofrequency and Microwave Radiation
- Electromagnetic Fields
- Asbestos
- Nanoparticles

9. DIETARY FACTORS

- Methodologic Challenges
- The Role of Individual Food and Nutrients in Cancer Etiology
- Other Foods and Nutrients
- Dietary Patterns
- Diet During the Early Phases of Life
- Diet after a Diagnosis of Cancer
- Summary
- Limitations
- Future Directions

10. OBESITY AND PHYSICAL ACTIVITY

- Breast Cancer
- Colon and Rectal Cancer
- Endometrial Cancer
- Adenocarcinoma of the Esophagus
- Kidney/Renal Cell Cancer
- Pancreatic Cancer
- Gallbladder Cancer
- Non-Hodgkin Lymphoma
- Prostate Cancer
- Lung Cancer
- Ovarian Cancer

SECTION – II - EPIDEMIOLOGY OF CANCER

11. EPIDEMIOLOGIC METHODS

- Analytical Studies
- Interpretation of Epidemiologic Findings
- Cancer Outcomes Research
- Molecular Epidemiology

12. TRENDS IN UNITED STATES CANCER MORTALITY

- Cancer Surveillance Systems
- Making Sense of Cancer Trends
- Trends in Cancer Risk Factors and Screening
- Cancer Incidence and Mortality
- Predicting Future Cancer Trends

13. ESSENTIALS OF RADIATION THERAPY

- Biologic Aspects of Radiation Oncology
- Factors that Affect Radiation Response
- Drugs that Affect Radiation Sensitivity
- Radiation Physics
- Treatment Planning
- Other Treatment Modalities
- Clinical Applications of Radiation Therapy
- Treatment Intent
- Fractionation
- Adverse Effects
- Principles of Combining Anticancer Agents with Radiation Therapy

14. CANCER IMMUNOTHERAPY

- Human Tumor Antigens
- Human Cancer Immunotherapies

15. PHARMACOKINETICS AND PHARMACODYNAMICS OF ANTICANCER DRUGS

- Pharmacokinetic Concepts
- Pharmacodynamic Concepts
- Variability in Pharmacokinetics/Pharmacodynamics
- Dose-Adaptation Using Pharmacokinetic/Pharmacodynamic Principles

16. PHARMACOGENOMICS

- Pharmacogenomics of Tumor Response
- Pharmacogenomics of Chemotherapy Drug Toxicity
- Conclusions and Future Directions

17. ALKYLATING AGENTS

- Perspectives
- Chemistry
- Classification
- Clinical Pharmacokinetics/Pharmacodynamics
- Therapeutic Uses
- Toxicities
- Complications with High-Dose Alkylating Agent Therapy
- Alkylating Agent-Steroid Conjugates
- Drug Resistance and Modulation
- Recent Developments

18. PLATINUM ANALOGS

- History
- Platinum Chemistry
- Platinum Complexes after Cisplatin
- Mechanism of Action
- Cellular Responses to Platinum-Induced DNA Damage
- Is DNA the Only Target?
- Mechanisms of Resistance
- Clinical Pharmacology
- Formulation and Administration
- Toxicity

19. ANTIMETABOLITES

- Antifolates
- Fluoropyrimidines
- Capecitabine
- Cytarabine
- Gemcitabine
- Thiopurines
- Fludarabine
- Cladribine
- Clofarabine

20. TOPOISOMERASE INTERACTIVE AGENTS

- Classification, Biochemical, and Biologic Functions of Topoisomerases
- Topoisomerase Inhibitors as Interfacial Poisons
- Topoisomerase I Inhibitors: Camptothecins and Beyond
- Topoisomerase II Inhibitors: Intercalators and Nonintercalators
- Therapy-Related Secondary Acute Leukemia
- Future Directions

21. ANTIMICROTUBULE AGENTS

- Microtubules
- Taxanes
- Vinca Alkaloids
- Microtubule Antagonists
- Mitotic Motor Protein Inhibitors
- Mechanisms of Resistance to Microtubule Inhibitors

22. KINASE INHIBITORS AS ANTICANCER DRUGS

- Early Successes: Targeting Cancers with Well-Known Kinase Mutations (BCR-ABL, KIT, Her2)
- Directly Targeting the PI3K Pathway
- Combinations of Kinase Inhibitors to Induce Response and Prevent Resistance
- Speculations on the Future Role of Kinase Inhibitors in Cancer Medicine

23. HISTONE DEACETYLASE INHIBITORS AND DEMETHYLATING AGENTS

- Epigenetic Abnormalities and Gene Expression Changes in Cancer
- Histone Deacetylase Inhibitors
- Epigenetic Therapy for Hematologic Malignancies
- New Approaches to Epigenetic Therapy

24. PROTEASOME INHIBITORS

- Biochemistry of the Ubiquitin-Proteasome Pathway
- Proteasome Inhibitors
- Proteasome Inhibitors in Cancer

25. POLY (ADP-RIBOSE) POLYMERASE INHIBITORS

- Cellular DNA Repair Pathways
- The Development of PARP Inhibitors

- *BRCA1* and *BRCA2* Mutations and DNA Repair
- PARP-1 Inhibition as a Synthetic Lethal Therapeutic Strategy for the Treatment of BRCA-Deficient Cancers
- Initial Clinical Results Testing Synthetic Lethality of PARP Inhibitors and BRCA Mutation
- The Use of PARP Inhibitors in Sporadic Cancers
- Mechanisms of Resistance to PARP Inhibitors
- Prospects

26. MISCELLANEOUS CHEMOTHERAPEUTIC AGENTS

- Homoharringtonine and Omacetaxine
- L-Asparaginase
- Bleomycin
- Procarbazine
- Vismodegib
- Ado-Trastuzumab Emtansine
- Sirolimus and Temsirolimus
- Everolimus
- Thalidomide, Lenalidomide, and Pomalidomide

27. HORMONAL AGENTS

- Selective Estrogen Receptor Modulators
- Aromatase Inhibitors
- Gonadotropin-Releasing Hormone Analogs
- Gonadotropin-Releasing Hormone Antagonists
- Antiandrogens
- Novel Antiandrogens
- Other Sex Steroid Therapies
- Other Hormonal Therapies

28. ANTIANGIOGENESIS AGENTS

- Understanding the Angiogenic Process
- Drug Development of Angiogenesis Inhibitors
- Clinical Utility of Approved Antiangiogenic Agents in Cancer Therapy
- Combination Therapies
- Biomarkers of Antiangiogenic Therapy
- Resistance to Antiangiogenic Therapy

29. PHARMACOLOGY OF CANCER BIOTHERAPEUTICS MONOCLONAL ANTIBODIES

- Immunoglobulin Structure

- Modified Antibody-Based Molecules
- Factors Regulating Antibody-Based Tumor Targeting
- Unconjugated Antibodies
- Altering Signal Transduction
- Immunoconjugates
- Antibodies Approved for Use in Solid Tumors
- Antibodies Used in Hematologic Malignancies

30. ASSESSMENT OF CLINICAL RESPONSE

- Assessing Response
- Alternate Response Criteria
- Determining Outcome

PART IV CANCER PREVENTION AND SCREENING

31. TOBACCO USE AND THE CANCER PATIENT

- Neurobiology of Tobacco Dependence
- Tobacco Use Prevalence and the Evolution of Tobacco Products
- Tobacco Use by the Cancer Patient
- The Clinical Effects of Smoking on the Cancer Patient
- Addressing Tobacco Use by the Cancer Patient
- Future Considerations

32. ROLE OF SURGERY IN CANCER PREVENTION

- Patients at High Risk for Breast Cancer
- Hereditary Diffuse Gastric Cancer
- Surgical Prophylaxis of Hereditary Ovarian and Endometrial Cancer
- Hereditary Endometrial Cancer (Lynch Syndrome)
- Gynecologic Cancer Risk in Very Rare Hereditary Cancer Syndromes
- Multiple Endocrine Neoplasia Type 2
- Familial Adenomatous Polyposis, *MYH*-Associated Polyposis, and Lynch Syndrome

33. CANCER RISK-REDUCING AGENTS

- Why Cancer Prevention as a Clinical Oncology Discipline
- Defining Cancer Risk-Reducing Agents (Chemoprevention)
- Identifying Potential Cancer Risk-Reducing Agents
- Preclinical Development of Cancer Risk-Reducing Agents
- Clinical Development of Cancer Risk-Reducing Agents
- Micronutrients
- Anti-Inflammatory Drugs

- Epigenetic Targeting Agents (Selective Estrogen Receptor Modulators, 5 α -Steroid Reductase Inhibitors, Polyamine Inhibitors)
- Signal Transduction Modifiers
- Anti-Infectives
- Multiagent Approaches to Cancer Risk Reduction

34. CANCER SCREENING

- Performance Characteristics
- Assessing Screening Tests and Outcomes
- Problems with Randomized Trials
- Screening Guidelines and Recommendations
- Breast Cancer Screening
- Cancers of the Gastrointestinal Tract
- Gynecologic Cancer
- Lung Cancer Screening
- Prostate Cancer Screening
- Skin Cancer Screening

35. GENETIC COUNSELING

- Who is a Candidate for Cancer Genetic Counseling?
- Components of the Cancer Genetic Counseling Session
- Issues in Cancer Genetic Counseling
- Recent Advances and Future Directions

PART V PRACTICE OF ONCOLOGY

36. DESIGN AND ANALYSIS OF CLINICAL TRIALS

- Phase 1 Clinical Trials
- Phase 2 Clinical Trials
- Design of Phase 3 Clinical Trials
- Factorial Designs
- Analysis of Phase 3 Clinical Trials
- Reporting Results of Clinical Trials
- False Positive Reports in the Literature
- Meta-analysis

SECTION 1. CANCER OF THE HEAD AND NECK

37. Molecular Biology of Head and Neck Cancers

- Molecular Mechanisms in Head and Neck Squamous Cell Carcinoma
- The Cancer Genome Atlas Project

- Cancer Stem Cells

38. Cancer of the Head and Neck

- Incidence and Etiology
- Anatomy and Pathology
- Natural History
- Diagnosis
- Staging
- Principles of Treatment for Squamous Cell Carcinoma
- Management

NECK

- Chemotherapy
- General Principles of Combining Modalities
- Chemotherapy as Part of Curative Treatment
- Follow-Up

ORAL CAVITY

- Lip
- Floor of the Mouth
- Oral Tongue
- Buccal Mucosa
- Gingiva and Hard Palate (including Retromolar Trigone)
- Oropharynx
- Anatomy
- Pathology
- Patterns of Spread
- Clinical Picture
- Staging
- Treatment: Base of Tongue
- Results of Treatment: Base of Tongue
- Follow-Up: Base of Tongue
- Complications of Treatment: Base of Tongue
- Treatment: Tonsillar Area
- Results of Treatment: Tonsillar Area
- Complications of Treatment: Tonsillar Area
- Surgical Treatment
- Treatment: Soft Palate
- Results of Treatment: Soft Palate
- Complications of Treatment: Soft Palate

LARYNX

- Anatomy
- Pathology
- Patterns of Spread

- Clinical Picture
- Differential Diagnosis and Staging
- Treatment: Vocal Cord Carcinoma
- Treatment: Supraglottic Larynx Carcinoma
- Treatment: Subglottic Larynx Carcinoma
- Treatment: Supraglottic Larynx Cancer

HYPOPHARYNX: PHARYNGEAL WALLS, PYRIFORM SINUS, AND POSTCRICOID PHARYNX

- Anatomy
- Pathology
- Patterns of Spread
- Clinical Picture
- Staging
- Treatment
- Results of Treatment
- Complications of Treatment

NASOPHARYNX

- Anatomy
- Pathology
- Patterns of Spread
- Clinical Picture
- Staging
- Treatment
- Nasal Vestibule, Nasal Cavity, and Paranasal Sinuses
- Paragangliomas
- Major Salivary Glands
- Minor Salivary Glands

39. REHABILITATION AFTER TREATMENT OF HEAD AND NECK CANCER

- Pretreatment Counseling
- Support During Treatment and Rehabilitation of the Chemoradiation Patient
- Resources for Rehabilitation of Head and Neck Cancer Patients

SECTION 2. CANCER OF THE THORACIC CAVITY

40. MOLECULAR BIOLOGY OF LUNG CANCER

- Susceptibility to Lung Cancer: Genetic Susceptibility and Carcinogens in Tobacco Smoke
- Molecular Changes in Preneoplasia
- Genetic and Epigenetic Alterations in Lung Cancers

- Protooncogenes, Growth Factor Signaling, and Growth Factor-Targeted Therapies
- The Technology of Genomic Analyses of Lung Cancer
- Epigenetics/Epigenome
- Tumor Suppressor Genes and Growth Suppression
- Cyclins and Cell Cycle Regulatory Pathways
- LKB1, AMPK, and mTOR Pathway
- Other Putative Tumor Suppressors
- Other Biologic Abnormalities in Lung Cancer
- MicrornAS in Lung Cancer Diagnostics and Therapy
- MiRNA Profiling in Lung Cancer
- Invasion, Metastasis, and Angiogenesis
- Cancer Stem Cell Hypothesis 12
- Molecular Tools in the Lung Cancer Clinic

41. NON-SMALL CELL LUNG CANCER

- Incidence and Etiology
- Anatomy and Pathology
- Prevention and Screening
- Diagnosis
- Stage Evaluation
- Management by Stage
- Special Clinical Situations
- Palliative Care

42. SMALL CELL AND NEUROENDOCRINE TUMORS OF THE LUNG

- Small Cell Lung Cancer
- Typical and Atypical Carcinoid Tumors
- Large Cell Neuroendocrine Carcinoma

43. NEOPLASMS OF THE MEDIASTINUM

- Thymic Neoplasms
- Thymoma
- Thymic Carcinoma
- Thymic Carcinoid
- Thymolipoma
- Germ Cell Tumors

SECTION 3. CANCERS OF THE GASTROINTESTINAL TRACT

44. MOLECULAR BIOLOGY OF THE ESOPHAGUS AND STOMACH

Molecular Biology of Esophageal Cancer

Molecular Biology of Gastric Cancer

45. CANCER OF THE ESOPHAGUS

- Epidemiology
- Etiologic Factors and Predisposing Conditions
- Applied Anatomy and Histology
- Natural History and Patterns of Failure
- Clinical Presentation
- Diagnostic Studies and Pretreatment Staging
- Pathologic Staging
- Treatment
- Stage-directed Treatment Recommendations

46. CANCER OF THE STOMACH

- Anatomic Considerations
- Pathology and Tumor Biology
- Histopathology
- Patterns of Spread
- Clinical Presentation and Pretreatment Evaluation
- Pretreatment Staging
- Staging, Classification, and Prognosis
- Gastric Cancer Nomograms: Predicting Individual Patient Prognosis after Potentially Curative Resection
- Treatment of Localized Disease
- Technical Treatment-Related Issues
- Treatment of Advanced Disease (Stage IV)
- Surgery in Treatment of Metastatic Gastric Cancer
- Radiation for Palliation

47. GENETIC TESTING IN STOMACH CANCER

- Histologic Definitions and Descriptions
- Etiology
- Epidemiology of Gastric Cancer
- Screening and Management of Cancer Risk in HDGC
- Other Hereditary Cancer Susceptibility Syndromes with Increased Gastric Cancer Risk

48. MOLECULAR BIOLOGY OF PANCREAS CANCER

- Common Molecular Changes

49. CANCER OF THE PANCREAS

- Staging
- Epidemiology
- Pathology and Biology
- Exocrine Pancreatic Cancers
- Endocrine Pancreatic Cancers
- Pathology and Biology
- Exocrine Pancreatic Cancers
- Endocrine Pancreatic Cancers
- Stage I and II: Localized Pancreatic Ductal Adenocarcinoma
- Patterns of Failure
- Stage III: Locally Advanced Disease
- Emerging Role of Stereotactic Body Radiotherapy
- Stage IV: Metastatic Disease
- Future Directions and Challenges

50. GENETIC TESTING IN PANCREATIC CANCER

- Selected Genes that May Cause Pancreatic Cancer
- Selected Syndromes that Increase the Risk of Pancreatic Cancer
- Empiric Risk Counseling and Management

51. MOLECULAR BIOLOGY OF LIVER CANCER

- Genetic Alterations in Liver Cancer
- Epigenetic Alterations in Liver Cancer
- Mutational Landscape of Genetic Alterations in HCC: The Next Generation
- The Microenvironment of Liver Cancer
- Classification and Prognostic Prediction of Hepatocellular Carcinoma

52. CANCER OF THE LIVER

- Epidemiology
- Etiologic Factors
- Staging
- Diagnosis
- Treatment of Hepatocellular Carcinoma
- Adjuvant and Neoadjuvant Therapy
- Treatment of Other Primary Liver Tumors

53. CANCER OF THE BILIARY TREE

- Anatomy of the Biliary Tract
- Cholangiocarcinoma

- Gallbladder Cancer

54. CANCER OF THE SMALL BOWEL

- Small Bowel Cancer
- Adenocarcinoma
- Carcinoid Tumors
- Small Bowel Lymphoma
- Gastrointestinal Stromal Tumors
- Other Mesenchymal Tumors
- Metastatic Cancer to the Small Bowel

55. GASTROINTESTINAL STROMAL TUMOR

- Incidence and Etiology
- Anatomy and Pathology
- Screening
- Diagnosis
- Staging
- Management by Stage
- Palliative Care

56. MOLECULAR BIOLOGY OF COLORECTAL CANCER

- Multistep Models of Colorectal Tumorigenesis
- Inherited Syndromes of Increased Cancer Risk Highlight Early Events and Critical Pathways in Colorectal Tumorigenesis
- Oncogene and Tumor Suppressor Gene Mutations in Colorectal Cancer Progression
- The Mutational Landscape of Colorectal Cancer
- An Integrated Model for Colorectal Cancer Initiation and Progression
- Summary

57. CANCER OF THE COLON

- Epidemiology
- Etiology: Genetic and Environmental Risk Factors
- Familial Colorectal Cancer
- Anatomy of the Colon
- Diagnosis of Colorectal Cancer
- Screening for Colorectal Cancer
- Staging and Prognosis of Colorectal Cancer
- Approaches to Surgical Resection of Colon Cancer
- Surgical Management of Complications from Primary Colon Cancer
- Polyps and Stage I Colon Cancer
- Stage II and Stage III Colon Cancer

- Treatment of Stage II Patients
- Treatment Options for Stage III Patients
- Follow-Up after Management of Colon Cancer with Curative Intent
- Surgical Management of Stage IV Disease
- Management of Unresectable Metastatic Disease
- Molecular Predictive Markers

58. GENETIC TESTING IN COLON CANCER (POLYPOSIS SYNDROMES)

Adenomatous Polyposis
Hamartomatous Polyposis

59. GENETIC TESTING IN COLON CANCER (NONPOLYPOSIS SYNDROMES)

Clinical Classification: Amsterdam Criteria and Bethesda Guidelines
Tumor Screening
Genetic Testing
Genetic Counseling for Lynch Syndrome
Management of Lynch Syndrome

60. CANCER OF THE RECTUM

Anatomy
Staging
Surgery
Does Adjuvant Radiation Therapy Impact Survival?
Preoperative Radiation Therapy
Which Patients Should Receive Adjuvant Therapy?
Concurrent Chemotherapy
Synchronous Rectal Primary and Metastases
Management of Unresectable Primary and Locally Advanced Disease (T4)
Radiation Therapy Technique

61. CANCER OF THE ANAL REGION

- Epidemiology and Etiology
- Screening and Prevention
- Pathology
- Clinical Presentation and Staging
- Prognostic Factors
- Treatment of Localized Squamous Cell Carcinoma

- Treatment of Other Sites and Pathologies

SECTION 4. CANCERS OF THE GENITOURINARY SYSTEM

62. MOLECULAR BIOLOGY OF KIDNEY CANCER

Von Hippel-Lindau Disease

Hereditary Papillary Renal Carcinoma Type 1

Xp11.2 Translocation Renal Cell Cancer

Birt-Hogg-Dubé Syndrome

Hereditary Leiomyomatosis and Renal Cell Carcinoma

Familial Renal Cancer: Succinate Dehydrogenase Gene

Tuberous Sclerosis Complex

63. CANCER OF THE KIDNEY

- Epidemiology, Demographics, and Risk Factors
- Pathology of Renal Cell Carcinoma
- Differential Diagnosis and Staging
- Hereditary Kidney Cancer Syndromes, Genetics, and Molecular Biology
- Treatment of Localized Renal Cell Carcinoma
- Treatment of Locally Advanced Renal Cell Carcinoma
- Adjuvant Therapy for Renal Cell Carcinoma
- Surgical Management of Advanced Renal Cell Carcinoma
- Systemic Therapy for Advanced Renal Cell Carcinoma
- Conclusion and Future Directions

64. MOLECULAR BIOLOGY OF BLADDER CANCER

- Key Molecular Alterations in Stage Ta Urothelial Carcinoma
- Key Molecular Alterations in Invasive Urothelial Carcinoma
- Information from Exome Sequencing
- Epigenetic Alterations
- Information from Expression Profiling
- Urothelial Tumor-Initiating Cells
- Molecular Pathogenesis and Tumor Clonality
- Multiple Tumor Subgroups Defined by Molecular Profiling

65. CANCER OF THE BLADDER, URETER, AND RENAL PELVIS

- Urothelial Cancers
- Cancer of the Bladder
- Cancers of the Renal Pelvis and Ureter

66. GENETIC TESTING IN URINARY TRACT CANCERS

- Genetic Susceptibility to Renal Cell Carcinoma
- Genetic Susceptibility to Urothelial Cancers
- Indications for Genetic Testing
- Genetic Testing and Counseling

67. MOLECULAR BIOLOGY OF PROSTATE CANCER

- Overview of the Genomic Landscape of Prostate Cancer
- Androgen Receptor Biology and Therapy
- Additional Pathways Frequently Altered During Disease Progression
- ETS Gene Fusions and the Molecular Subtypes of Prostate Cancer
- Emerging Areas in Prostate Cancer Biology and Therapy

68. CANCER OF THE PROSTATE

- Incidence and Etiology
- Anatomy and Pathology
- Screening
- Diagnosis, Risk Assessment, and State Assignment
- Principles of Treatment and Assessing Outcomes
- Management by Clinical States
- External Beam Radiotherapy
- Androgen Deprivation Therapy and Radiotherapy
- Adjuvant Radiation Therapy for High-Risk Patients after Radical Prostatectomy
- The Rising Prostate-Specific Antigen State
- Advanced Prostate Cancer: Rising Prostate-Specific Antigen and Clinical Metastases—Noncastrate and Castrate
- Palliation
- Future Directions

69. CANCER OF THE URETHRA AND PENIS

- Cancer of the Male Urethra
- Carcinoma of the Female Urethra
- Cancer of the Penis

70. CANCER OF THE TESTIS

- Incidence and Epidemiology
- Initial Presentation and Management
- Histology
- Biology
- Immunohistochemical Markers
- Staging
- Management of Clinical Stage I Disease

- Management of Clinical Stage II (Low Tumor Burden)
- Management of Stage II with High Tumor Burden and Stage III Disease
- Management of Recurrent Disease
- Treatment Sequelae
- Long-Term Follow-up
- Midline Tumors of Uncertain Histogenesis
- Other Testicular Tumors

SECTION 5. GYNECOLOGIC CANCERS

71. MOLECULAR BIOLOGY OF GYNECOLOGIC CANCERS

- Ovarian Cancer
- Endometrial Cancer
- Cervix, Vaginal, and Vulvar Cancers

72. CANCER OF THE CERVIX, VAGINA, AND VULVA

- Carcinoma of the Vagina
- Carcinoma of the Vulva
- Carcinoma of the Cervix

73. CANCERS OF THE UTERINE BODY

- Endometrial Carcinoma
- Uterine Sarcomas

74. GENETIC TESTING IN UTERINE CANCER

- Lynch Syndrome (Also Known as Hereditary Nonpolyposis Colorectal Cancer Syndrome)
- Phosphatase and Tensin Homolog Hamartoma Tumor Syndrome (Also Known as Cowden Syndrome, Bannayan-Ruvalcaba-Riley Syndrome)
- Hereditary Leiomyomatosis and Renal Cell Carcinoma
- Uterine Cancer and Other Hereditary Cancer Syndromes

75. GESTATIONAL TROPHOBLASTIC DISEASES

- Incidence
- Pathology and Natural History
- Indications for Treatment
- Measurement of Human Chorionic Gonadotropin
- Pretreatment Evaluation
- Staging and Prognostic Score
- Treatment

- Placental Site or Epithelioid Trophoblastic Tumors
- Subsequent Pregnancy after Treatment for Gestational Trophoblastic Neoplasia
- Psychosocial Issues

76. OVARIAN CANCER, FALLOPIAN TUBE CARCINOMA, AND PERITONEAL CARCINOMA

- Epithelial Ovarian Cancer
- Borderline Tumors
- Germ Cell Tumors of the Ovary
- Sex Cord-Stromal Tumors
- Primary Peritoneal Serous Carcinoma
- Fallopian Tube Cancer

77. GENETIC TESTING IN OVARIAN CANCER

- Hereditary Breast and Ovarian Cancer Syndrome (The *BRCA1* and *BRCA2* Genes)
- Lynch Syndrome
- Peutz-Jeghers Syndrome
- Newer Genes

SECTION 6. CANCER OF THE BREAST

78. MOLECULAR BIOLOGY OF BREAST CANCER

- Genetics of Breast Cancer
- Hereditary Breast Cancer
- Somatic Changes in Breast Cancer
- Transcriptional Profiling of Breast Cancer
- Epigenetics of Breast Cancer
- Protein/Pathway Alterations
- Estrogen Receptor Pathway
- Growth Factor Receptor Pathways
- RAS and Phosphatidylinositol 3-Kinase Pathways
- Angiogenesis

79. MALIGNANT TUMORS OF THE BREAST

- Anatomy of the Breast
- Risk Factors for Breast Cancer
- Management of the High-Risk Patient
- Diagnosis and Biopsy
- Lobular Carcinoma in Situ

- Ductal Carcinoma in Situ
- Staging
- Pathology of Breast Cancer
- Local Management of Invasive Cancer
- Management of the Axilla
- Postmastectomy Radiation Therapy
- Prognostic and Predictive Factors in Breast Cancer
- Adjuvant Systemic Therapy
- Integration of Multimodality Primary Therapy
- Follow-Up for Breast Cancer Survivors
- Special Therapeutic Problems
- Management of Local-Regional Recurrence
- Metastatic Disease

80. GENETIC TESTING IN BREAST CANCER

- Identification of High-Risk Individuals
- Genetic Testing
- BRCA1 and BRCA2
- TP53
- Cowden Syndrome (Phosphatase and Tensin Homolog)
- Other Genetic Mutations and Breast Cancer
- Moderate- and Low-Penetrance Breast Cancer Genes

SECTION 7. CANCER OF THE ENDOCRINE SYSTEM

81. MOLECULAR BIOLOGY OF ENDOCRINE TUMORS

- The Multiple Endocrine Neoplasia Syndromes
- Application of Molecular Genetics to Clinical Medicine
- Thyroid Carcinomas
- Future Directions

82. THYROID TUMORS

- Anatomy and Physiology
- Thyroid Nodules
- Thyroid Tumor Classification and Staging Systems
- Differentiated Thyroid Cancer
- Treatment of Differentiated Thyroid Cancer
- Anaplastic Thyroid Carcinoma
- Medullary Thyroid Cancer
- Thyroid Lymphoma
- Children with Thyroid Carcinoma

83. PARATHYROID TUMORS

- Incidence and Etiology
- Anatomy and Pathology
- Clinical Manifestations and Screening
- Diagnosis
- Staging
- Management of Parathyroid Cancer
- Follow-Up and Natural History
- Prognosis

84. ADRENAL TUMORS

- Overview and Pathophysiology of the Adrenal Gland
- Molecular Genetics of Adrenal Neoplasms
- Incidence and Epidemiology
- Screening in Special Populations
- Diagnosis of Adrenal Neoplasia
- Grading and Staging of Malignancy
- Important Considerations in Perioperative Management of Adrenal Tumors
- Management
- Surveillance and Adjuvant Therapy for Adrenocortical Carcinoma
- Management of Locoregional Recurrence of Adrenocortical Carcinoma
- Management of Isolated Metastases of Adrenocortical Carcinoma
- Management of Metastatic or Unresectable Adrenocortical Carcinoma
- Emerging Diagnostic Techniques and Treatment Strategies for Adrenal Tumors
- Special Considerations in Pregnancy
- Adrenal Neoplasia in Childhood

85. PANCREATIC NEUROENDOCRINE TUMORS

- Epidemiology
- Classification, Histopathology, Molecular Genetics
- Diagnosis and Management of Pancreatic Neuroendocrine Tumors
- Additional Clinical Considerations
- Surgery Pitfalls

86. CARCINOID TUMORS AND THE CARCINOID SYNDROME

- Incidence and Etiology
- Anatomy and Pathology
- General Principles of Neuroendocrine Tumor Diagnosis, Staging, and Management

- Diagnosis, Staging, and Management by Primary Tumor Site
- Diagnosis and Management of Carcinoid Syndrome
- Antitumor Management
- Management of Liver Metastases

87. MULTIPLE ENDOCRINE NEOPLASIAS

- Multiple Endocrine Neoplasia Type 1
- Multiple Endocrine Neoplasia Type 2, Type 3, and Familial Medullary Thyroid Cancer
- Multiple Endocrine Neoplasia Type 4

88. GENETIC TESTING IN THE ENDOCRINE SYSTEM

- Multiple Endocrine Neoplasia Type 1
- Multiple Endocrine Neoplasia Type 2
- Phosphatase and Tensin Homolog on Chromosome 1
- SDHX/TMEM127/MAX
- Von Hippel-Lindau and Pheochromocytoma

SECTION 8. SARCOMAS OF SOFT TISSUE AND BONE

89. MOLECULAR BIOLOGY OF SARCOMAS

- SOFT TISSUE SARCOMAS
- Translocation-Associated Soft Tissue Sarcomas
- Soft Tissue Sarcomas of Simple Karyotype Associated with Mutations
- Complex Soft Tissue Sarcoma Types
- BONE AND CARTILAGINOUS TUMORS
- Cartilaginous Tumors
- Osteosarcoma
- Future Directions: Next-Generation Sequencing and Functional Screens

90. SOFT TISSUE SARCOMA

- Incidence and Etiology
- Anatomic and Age Distribution and Pathology
- Diagnosis and Staging
- Management by Presentation Status, Extent of Disease, and Anatomic Location
- Palliative Care
- Future Directions

91. SARCOMAS OF BONE

- Incidence and Etiology
- Anatomy and Pathology
- Screening
- Diagnosis
- Staging
- Management by Diagnosis and Stage
- Continuing Care: Surveillance and Palliation

SECTION 9. CANCERS OF THE SKIN

92. CANCER OF THE SKIN

NONMELANOMA SKIN CANCER

- Diagnosis
- General Approach to Management of Skin Cancer
- Topical Therapy for Skin Cancer
- Radiation Therapy for Skin Cancer

ACTINIC KERATOSES

- Pathogenesis of Actinic Keratosis
- Clinical Features of Actinic Keratosis
- Treatment of Actinic Keratosis

BASAL CELL CARCINOMA

- Clinical Behavior of Basal Cell Carcinoma
- Basal Cell Carcinoma Subtypes
- Histology 9
- Treatment

SQUAMOUS CELL CARCINOMA

- Pathogenesis of Squamous Cell Carcinoma
- Clinical Features of Squamous Cell Carcinoma and its Variants
- Histology
- Clinical Behavior of Squamous Cell Carcinoma
- Treatment
- Follow-Up
- Immunosuppression and Nonmelanoma Skin Cancer

ANGIOSARCOMA

- Pathogenesis
- Clinical Presentation and Prognosis
- Histology
- Treatment

DERMATOFIBROSARCOMA PROTUBERANS

- Pathogenesis
- Histology

- Treatment
- Recurrence and Metastatic Potential

MERKEL CELL CARCINOMA

- Pathogenesis
- Clinical Presentation
- Histology
- Treatment
- Staging
- Recurrence and Metastatic Risk
- Prognosis

MICROCYSTIC ADNEXAL CARCINOMA

- Clinical and Histologic Features
- Treatment and Prognosis
- SEBACEOUS CARCINOMA
- Clinical and Histologic Features
- Treatment and Prognosis

EXTRAMAMMARY PAGET DISEASE

- Clinical and Histologic Features
- Treatment and Prognosis

ATYPICAL FIBROXANTHOMA AND MALIGNANT FIBROUS HISTIOCYTOMA

ATYPICAL FIBROXANTHOMA

- Clinical and Histologic Features
- Treatment and Prognosis

CARCINOMA METASTATIC TO SKIN

93. MOLECULAR BIOLOGY OF CUTANEOUS MELANOMA

- The RAS-RAF-Map Kinase Pathway
- The MEK Pathway and Therapeutic Resistance
- Melanin Synthesis Pathway
- Molecular Genetics of Melanoma: Looking Ahead

94. CUTANEOUS MELANOMA

- Molecular Biology of Melanoma
- Epidemiology
- Changes in Incidence
- Gender and Age Distribution
- Melanoma in Children, Infants, and Neonates
- Anatomic Distribution
- Etiology and Risk Factors
- Prevention and Screening

- Diagnosis of Primary Melanoma
- General Considerations in Clinical Management of a Newly Diagnosed Cutaneous Melanoma (Stage I-II)
- Clinical Trials to Define Margins of Excision for Primary Cutaneous Melanomas
- Surgical Staging of Regional Nodes
- Management
- Special Considerations in Management of Primary Melanomas
- The Role of Radiation Therapy in the Management of Primary Melanoma Lesions
- Clinical Follow-Up for Intermediate-Thickness and Thick Melanomas (Stage Ib-IIc)
- Regionally Metastatic Melanoma (Stage III): Lymph Node Metastasis, Satellite Lesions, and In-Transit Metastases
- Management of Regional Metastases in Patients with Visceral or Other Distant Disease
- Adjuvant Systemic Therapy (Stages IIb, IIc, and III)
- Management of Distant Metastases of Melanoma (Stage IV)
- Experimental Immunologic Therapies for Metastatic Melanoma
- Radiation Therapy for Metastatic Melanoma (Stage IV)

95. GENETIC TESTING IN SKIN CANCER

- Genetic Counseling
- Hereditary Skin Cancer and the Neurofibromatoses

SECTION 10. NEOPLASMS OF THE CENTRAL NERVOUS SYSTEM

96. MOLECULAR BIOLOGY OF CENTRAL NERVOUS SYSTEM TUMORS

- Gliomas
- Meningiomas
- Medulloblastomas
- Ependymal Tumors

97. NEOPLASMS OF THE CENTRAL NERVOUS SYSTEM

- Epidemiology of Brain Tumors
- Classification
- Anatomic Location and Clinical Considerations
- Neurodiagnostic Tests
- Surgery
- Radiation Therapy
- Chemotherapy and Targeted Agents

- Specific Central Nervous System Neoplasms
- Gliomatosis Cerebri
- Optic, Chiasmal, and Hypothalamic Gliomas
- Brainstem Gliomas
- Cerebellar Astrocytomas
- Gangliogliomas
- Ependymoma
- Meningiomas
- Primitive Neuroectodermal or Embryonal Central Nervous System Neoplasms
- Pineal Region Tumors and Germ Cell Tumors
- Pituitary Adenomas
- Craniopharyngiomas
- Vestibular Schwannomas
- Glomus Jugulare Tumors
- Hemangioblastomas
- Chordomas and Chondrosarcomas
- Choroid Plexus Tumors
- Spinal Axis Tumors

SECTION 11. CANCERS OF CHILDHOOD

98. MOLECULAR BIOLOGY OF CHILDHOOD CANCERS

- Tumor Suppressor Genes
- Retinoblastoma: The Paradigm
- SDH Deficient GIST
- Neurofibromatoses
- Neuroblastoma
- Ewing Sarcoma Family of Tumors
- Rhabdomyosarcoma
- Hereditary Syndromes Associated with Tumors of Childhood Li-Fraumeni Syndrome
- Malignant Rhabdoid Tumors
- Dicer1 Syndrome
- Predictive Testing for Germ-Line Mutations and Childhood Cancers
- Molecular Therapeutics

99. SOLID TUMORS OF CHILDHOOD

- Multidisciplinary Care is Essential for Children and Adolescents with Solid Tumors
- Neuroblastoma
- Wilms Tumor
- Retinoblastoma

- Pediatric Bone Sarcomas: Osteosarcoma and Ewing Sarcoma
- Rhabdomyosarcoma
- Hepatoblastoma
- Germ Cell Tumors

100. LEUKEMIAS AND LYMPHOMAS OF CHILDHOOD

- Leukemias
- Lymphomas
- Supportive Care
- Long-Term, Palliative, and Hospice Care in Pediatric Oncology

SECTION 12. LYMPHOMAS IN ADULTS

101. MOLECULAR BIOLOGY OF LYMPHOMAS

- The Cell of Origin of Lymphoma
- General Mechanisms of Genetic Lesions in Lymphoma
- Molecular Pathogenesis of B-NHL
- Molecular Pathogenesis of T-Cell Non-Hodgkin Lymphoma
- Molecular Pathogenesis of Hodgkin Lymphoma

102. HODGKIN'S LYMPHOMA

- Biology of Hodgkin's Lymphoma
- Pathology of Hodgkin's Lymphoma
- Differential Diagnosis
- Early-Stage Hodgkin's Lymphoma
- Advanced-Stage Hodgkin's Lymphoma
- Special Circumstances
- Treatment

103. NON-HODGKIN'S LYMPHOMA

- Epidemiology and Etiology
- Biologic Background for Classification of Lymphoid Neoplasms
- Lymphoma Classification: The Principles of the World Health Organization (WHO) Classification of Lymphoid Neoplasms
- Principles of Management of Non-Hodgkin's Lymphoma
- Specific Disease Entities
- Mature T-Cell and Natural Killer Cell Neoplasms

104. CUTANEOUS LYMPHOMAS

- Mycosis Fungoides and the Sézary Syndrome
- Diagnosis and Staging
- Clinical Evaluation of Patients with Cutaneous Lymphoma
- Principles of Therapy of Mycosis Fungoides and the Sézary Syndrome
- Systemic Therapy for Mycosis Fungoides and the Sézary Syndrome
- Other Cutaneous Lymphomas

105. PRIMARY CENTRAL NERVOUS SYSTEM

- Epidemiology
- Pathology
- Diagnosis and Prognostic Factors
- Staging
- Treatment

SECTION 13. LEUKEMIAS AND PLASMA CELL TUMORS

106. MOLECULAR BIOLOGY OF ACUTE LEUKEMIAS

- Leukemic Stem Cell
- Elucidation of Genetic Events in Acute Leukemia
- Mutations that Target Core-Binding Factor
- Chromosomal Translocations that Target the Retinoic Acid Receptor Alpha Gene
- Mutations that Target Hox Family Members
- Chromosomal Translocations that Target the *MLL* Gene
- Mutation of *C/Ebpa*
- Mutation of GATA-1
- t(1;22) Translocation Associated with Infant AMKL
- Mutations of Epigenetic Modifiers
- Chromosomal Translocations that Result in Overexpression of C-MYC
- Chromosomal Translocations Involving the T-Cell Receptor
- Point Mutations in Acute Leukemia
- Mutations in Tumor Suppressor Genes
- Activating Mutations of Notch
- Mutations Altering Localization of NPM1
- Mutation of Lymphoid Development Genes in Acute Lymphoid Leukemia
- Mutational Complementation Groups in Acute Leukemias

107. MANAGEMENT OF ACUTE LEUKEMIAS

- Acute Myelogenous Leukemia
- Acute Lymphoblastic Leukemia

108. MOLECULAR BIOLOGY OF CHRONIC LEUKEMIAS

- Chronic Myeloid Leukemia
- Chronic Lymphocytic Leukemia

109. CHRONIC MYELOGENOUS LEUKEMIA

- Epidemiology
- Pathogenesis
- Diagnosis
- Prognostic Factors
- Therapy
- Advanced Phase Disease
- Future Directions

110. CHRONIC LYMPHOCYTIC LEUKEMIAS

- Molecular Biology
- Immune Abnormalities
- Diagnosis
- Treatment and Response Criteria
- New and Novel Treatments for Chronic Lymphocytic Leukemia
- Second Malignancies and Transformation
- Prolymphocytic Leukemia
- Large Granular Lymphocyte Leukemia
- Hairy Cell Leukemia

111. MYELOYDYSPLASTIC SYNDROMES

- Historical Perspective
- Epidemiology
- Etiology
- Pathology
- Pathogenesis
- Clinical Presentation
- Risk Assessment and Prognosis
- Management of Myelodysplastic Syndromes

112. Plasma Cell Neoplasms

- History
- Epidemiology
- Etiology
- Pathogenesis
- Drug Resistance

- Clinical Manifestations
- Treatment

SECTION 14. OTHER CANCERS

113. CANCER OF UNKNOWN PRIMARY SITE

- Pathologic Evaluation
- Studies of Molecular Gene Expression Tumor Profiling Assays in Cancer of Unknown Primary Diagnosis
- Clinical Features and Evaluation
- Treatment
- Special Issues in Carcinoma of Unknown Primary Site
- Unknown Primary Cancer in Children
- New Treatment Paradigm

114. BENIGN AND MALIGNANT MESOTHELIOMA

- Mechanism of Asbestos Carcinogenesis
- Overview of Molecular Mechanisms in Mesothelioma
- Alterations of Oncogenes in Mesothelioma
- Pathology of Mesothelioma
- Epidemiology and Clinical Presentation
- Diagnostic Approach for Presumed Mesothelioma
- Natural History
- Treatment
- Surgery for Pleural Mesothelioma
- Controversy Regarding Performance of Extrapleural Pneumonectomy
- Evolution of Lung Sparing Approaches for Macroscopic Complete Resection
- Chemotherapy
- Novel Therapeutic Approaches
- Radiotherapy for Mesothelioma

115. PERITONEAL METASTASES AND PERITONEAL MESOTHELIOMA

- Natural History Studies Document the Importance of Local-Regional Progression
- Patient Selection Using Quantitative Prognostic Indicators
- Appendiceal Malignancy
- Colorectal Peritoneal Metastases: Curative Treatment and Prevention
- Diffuse Malignant Peritoneal Mesothelioma
- Gastric Cancer
- Peritoneal Metastases in Ovarian Cancer
- Sarcomatosis

116. INTRAOCULAR MELANOMA

- Incidence and Etiology
- Anatomy and Pathology
- Ophthalmic Diagnosis
- Universal Staging and Uveal Melanoma
- Management of the Primary Uveal Melanoma
- Treatment for Special Cases
- Quality of Life
- Diagnosis of Uveal Melanoma Metastasis
- Biomarkers: Prognostic and Predictive Factors

SECTION 15. IMMUNOSUPPRESSION RELATED MALIGNANCIES**117. HIV-ASSOCIATED MALIGNANCIES**

- Cancer and HIV: Incidence and Etiology
- Kaposi Sarcoma
- Lymphoid Tumors in Patients with HIV
- Burkitt Lymphoma
- Human Papillomavirus-Associated Cancer in HIV Infection
- Cervical Cancer
- Anal Cancer
- Future Directions

118. TRANSPLANTATION-RELATED MALIGNANCIES

- Myelodysplasia and Acute Myeloid Leukemia
- Lymphomas
- Solid Tumors

SECTION 16. ONCOLOGIC EMERGENCIES**119. SUPERIOR VENA CAVA SYNDROME**

- Anatomy and Pathophysiology
- Clinical Presentation and Etiology
- Diagnostic Workup
- Disease-Specific Management and Outcomes
- Small-Cell Lung Cancer
- Non-Small-Cell Lung Cancer
- Non-Hodgkin Lymphoma
- Nonmalignant Causes
- Catheter-Induced Obstruction
- Treatment

- Areas of Uncertainty

120. INCREASED INTRACRANIAL PRESSURE

- Pathophysiologic Considerations
- Epidemiology and Pathogenesis
- Clinical Presentation
- Diagnosis
- Treatment

121. SPINAL CORD COMPRESSION

- Epidemiology
- Pathophysiology
- Clinical Presentation
- Differential Diagnosis
- Diagnosis
- Treatment
- Prognosis

122. METABOLIC EMERGENCIES

- Tumor Lysis Syndrome and Hyperuricemia
- Cancer and Hyponatremia
- Lactic Acidosis and Cancer
- Hypercalcemia and Cancer
- Cancer-Related Hemolytic Uremic Syndrome

SECTION 17. TREATMENT OF METASTATIC CANCER

123. METASTATIC CANCER TO THE BRAIN

- Leptomeningeal Metastases

124. METASTATIC CANCER TO THE LUNG

- Presentation and Diagnosis of Pulmonary Metastases
- Surgical Metastasectomy
- Ablative Therapies
- Treatment Concerns and Outcomes for Individual Histologies

125. METASTATIC CANCER TO THE LIVER

- Hepatic Colorectal Adenocarcinoma Metastases
- Hepatic Neuroendocrine Carcinoma Metastases
- Noncolorectal Nonneuroendocrine Hepatic Metastases

126. METASTATIC CANCER TO THE BONE

- Presentation

- Pathophysiology
- Diagnostic Evaluation
- Therapeutic Modalities
- Denosumab
- New Targeted Therapies in the Treatment of Metastatic Bone Disease
- External Beam Radiation Therapy
- Systemic Radionuclides
- Radiotherapy for Complications of Bone Metastases: Localized External Beam Radiotherapy for Pathologic Fractures
- Mechanical Stability and Fracture Risk

127. MALIGNANT PLEURAL AND PERICARDIAL EFFUSIONS

- Malignant Pleural Effusion

128. MALIGNANT ASCITES

- Incidence and Etiology
- Anatomy and Pathology
- Diagnosis
- Management

129. PARANEOPLASTIC SYNDROMES

- Paraneoplastic Neurologic Syndromes
- Paraneoplastic Endocrinology Syndromes
- Paraneoplastic Hematologic Syndromes
- Paraneoplastic Dermatologic Manifestations
- Paraneoplastic Rheumatologic Manifestations

SECTION 18. STEM CELL TRANSPLANTATION

130. Autologous Stem Cell Transplantation

- Autologous Hematopoietic Progenitor Cell Collection
- Autologous Hematopoietic Cell Transplantation Toxicities and Supportive Care
- Indications for Autologous Hematopoietic Cell Transplantation
- Autologous Hematopoietic Cell Transplantation for Plasma Cell Myeloma
- Autologous Hematopoietic Cell Transplantation for Lymphoid Malignancies
- Autologous Hematopoietic Cell Transplantation for Rarer Plasma Cell Dyscrasias
- Autologous Hematopoietic Cell Transplantation for Acute Myeloid Leukemia and Acute Lymphoblastic Leukemia
- Autologous Hematopoietic Cell Transplantation for Germ Cell Tumors
- Late Complications after Autologous Hematopoietic Cell Transplantation

131. Allogeneic Stem Cell Transplantation

- Conditioning Regimens

- Stem Cell Sources
- Immunobiology of Allogeneic Hematopoietic Cell Transplantation
- Complications of Allogeneic Hematopoietic Cell Transplantation and their Management
- Graft Failure
- Outcome of Allogeneic Hematopoietic Cell Transplantation for Hematologic Malignancies and Solid Tumors
- Management of Posttransplant Relapse
- Future Directions

SECTION 19. MANAGEMENT OF ADVERSE EFFECTS OF TREATMENT

132. INFECTIONS IN THE CANCER PATIENT

- Risk Factors for Infection
- Prevention of Infections
- Fever and Neutropenia
- Multidrug Resistant Organisms of Interest in Oncology

133. NEUTROPENIA AND THROMBOCYTOPENIA

134. CANCER ASSOCIATED THROMBOSIS

- Mechanisms of Cancer-Associated Thrombosis
- Epidemiology of Cancer-Associated Thrombosis
- Prevention of Cancer-Associated Thrombosis
- Treatment of Cancer-Associated Thrombosis

135. NAUSEA AND VOMITING

- Nausea and Vomiting Syndromes
- Pathophysiology of Treatment-Induced Nausea and Vomiting
- Defining the Risk of Nausea and Vomiting
- Antiemetic Agents
- Antiemetic Treatment by Clinical Setting
- Special Chemotherapy-Induced Nausea and Vomiting Problems
- Radiotherapy-Induced Nausea and Vomiting

136. DIARRHEA AND CONSTIPATION

- Diarrhea
- Constipation

137. ORAL COMPLICATIONS

- Oral Mucositis
- Chemotherapy-Induced Mucositis
- Radiation-Induced Mucositis
- Radiation Therapy-Related Complications

- Pathogenesis of Chemotherapy- and Radiation-Induced Oral Mucositis
- Chronic Graft-Versus-Host Disease Oral Manifestations
- Sequelae of Oral Complications
- Strategies for Prevention and Treatment of Oral Complications
- Treatment Strategies
- Radioprotectors
- Biologic Response Modifiers
- Treatment for Oral Chronic Graft-Versus-Host Disease
- Symptom Management

138. PULMONARY TOXICITY

- Radiation-Induced Pulmonary Toxicity
- Chemotherapy-Induced Pulmonary Toxicity

139. CARDIAC TOXICITY

- Chemotherapeutics
- Radiotherapy-Associated Cardiac Sequelae

140. HAIR LOSS

- Anatomy and Physiology
- Classification
- Diagnosis
- Treatment

141. GONADAL DYSFUNCTION

- Effects of Cytotoxic Agents on Adult Men
- Effects of Cytotoxic Agents on Adult Women
- Effects of Cytotoxic Agents on Children
- Gonadal Dysfunction after Cranial Irradiation
- Preservation of Fertility, Hormone Levels, and Sexual Function
- Pharmacologic Attempts at Preserving Fertility in Men
- Pharmacologic Attempts at Preserving Fertility in Women
- Fertility Preservation in Women with Cervical Cancer
- Evaluation of Fertility after Treatment
- Hormone Replacement Therapy
- Prevention and Management of Erectile and Ejaculatory Dysfunction
- Genetic Concerns

142. FATIGUE

- Definition and Etiology of Cancer-Related Fatigue
- Current Theories of Cancer-Related Fatigue
- Evaluation of the Patient with Cancer-Related Fatigue
- Interventions for Fatigue

- Treatment of Anemia with Erythropoiesis-Stimulating Agents
- Exercise
- Management of Concurrent Symptoms
- Psychoeducational Interventions
- Interventions to Improve Sleep Quality
- Structured Rehabilitation
- Integrative Therapies

143. SECOND CANCERS

- Carcinogenicity of Individual Treatment Modalities
- Genetic Susceptibility to Second Primary Cancers
- Risk of Second Malignancy in Patients with Selected Primary Cancers
- Pediatric Malignancies

144. NEUROCOGNITIVE EFFECTS

- Assessment of Cognitive Function
- Impact of Tumor
- Impact of Treatment
- Treatment of Cognitive Dysfunction

145. CANCER SURVIVORSHIP

- Definition of Survivorship and Scope of the Problem
- Goals of Survivorship Health Care
- Care Plans
- Delivery of Follow-Up Care and Best Practice Models
- Educational Considerations
- Enhancing Research
- Survivorship Advocacy

PART VI

PALLIATIVE AND ALTERNATIVE CARE

SECTION 1. SUPPORTIVE CARE AND QUALITY OF LIFE

146. MANAGEMENT OF CANCER PAIN

- Epidemiology
- Definition of Pain
- Common Pain Syndromes
- Management of Cancer Pain
- Psychological Approaches
- Anesthetic and Neurosurgical Approaches
- Neuropharmacologic Approaches

- Neuroablative and Neurostimulatory Procedures for the Relief of Pain
- Trigger Point Injection and Acupuncture
- Psychiatric Approaches
- Algorithm for Cancer Pain Management
- Future Directions

147. NUTRITIONAL SUPPORT

- Background
- Causes of Malnutrition in Cancer Patients
- Cancer Cachexia Syndrome
- Nutrition Screening and Assessment
- Pharmacotherapy of Cancer-Associated Weight Loss and Malnutrition
- Nutrition Support of Cancer Patients
- Effect of Nutrition Support on Tumor Growth
- Glycemic Control in Patients with Cancer
- Palliative Nutrition Support in Patients Not Receiving Anticancer Treatment

148. SEXUAL PROBLEMS

- Cancer in Men
- Cancers that Affect Men and Women
- Cancer in Women
- Cancer in Children and Young Adults
- Relevant Sociocultural Considerations
- Disruption of Intimacy and Relational Considerations

149. PSYCHOLOGICAL ISSUES

- Common Psychiatric Conditions
- Screening for Psychological Problems
- Coping
- Treatment Interventions
- Outcome
- Implications for Cancer Progression and Mortality
- Psychotropic Medication

150. COMMUNICATING NEWS TO THE CANCER PATIENT

- Preventing Illness
- Communication
- Explanations
- Uncomfortable Questions
- Information
- Meaning

- Cafeteria Explanations

151. SPECIALIZED CARE OF THE TERMINALLY III

- Interdisciplinary Care for Patients with Advanced Cancer
- Early Palliative Care
- Communication
- Specific Problems in the Setting of Advanced Cancer
- Dyspnea
- Malignant Bowel Obstruction
- Malignant Biliary Obstruction
- Gastric Outlet Obstruction
- Malignant Ascites
- Wounds
- Bleeding
- Impending Death

152. REHABILITATION OF THE CANCER PATIENT

- Complications of Cancer and its Treatment
- Neuromuscular Complications of Cancer and Cancer Treatment
- Musculoskeletal Complications of Cancer and Cancer Treatment
- Radiation Fibrosis Syndrome
- Head and Neck Cancer
- Lymphedema
- Rehabilitation Interventions
- Nonpharmacologic Pain Management

SECTION 2. COMPLEMENTARY, ALTERNATIVE, AND INTEGRATIVE THERAPIES COMPLEMENTARY, ALTERNATIVE, AND INTEGRATIVE THERAPIES IN CANCER CARE

153. COMPLEMENTARY, ALTERNATIVE, AND INTEGRATIVE THERAPIES IN CANCER CARE

- Background
- Establishing an Integrative Oncology Approach with Patients Standardization and Quality
- Specific Complementary and Alternative Medicine Therapies

Bioethics

1. Respect human life and the dignity of every individual.
2. Refrain from supporting or committing crimes against humanity and condemn all such acts.
3. Treat the sick and injured with competence and compassion and without prejudice and apply the knowledge and skills when needed.
4. Protect the privacy and confidentiality of those for whom we care and breach that

confidence only when keeping it would seriously threaten their health and safety or that of others.

5. Work freely with colleagues to discover, develop, and promote advances in medicine

and public health that ameliorate suffering and contribute to human well being.

6. Educate the public about present and future threats to the health of humanity.

7. Advocate for social, economic, educational and political changes that ameliorate suffering and contribute to human well being.

8. Teach and mentor those who follow us, for they are the future of our caring profession.

3. CLINICAL TRAINING:

Clinical training during the 3 year period will involve Postings surgical oncology and in allied specialities like medical and radiation oncology, onco-pathology, molecular oncology, epidemiology & biostatistics, endoscopy, pain & palliative care. During the clinical postings, the student is expected to work under the guidance of the faculty in the wards, out-patient departments and the operation theatres. The student is expected to be involved in all aspects of patient care in the wards, do the ward rounds independently and with the faculty, examine patients in the out-patient department and order investigations as required and discuss with the faculty about the final treatment plan, observe, assist and perform surgeries under supervision, be involved in the postoperative management of the patients including intensive care. The student is also expected to take part in all academic programmes including but not limited to lectures, case presentations, debates, multi-disciplinary tumor board etc. Exposure to Minimally invasive surgical procedures, Prevention, screening, early detection, Palliative care, rehabilitation, etc.

Medical Oncology - (1 month)

Radiation Oncology - (1 month)

Onco-pathology, Molecular oncology, Epidemiology & Biostatistics,
Endoscopy, Pain & Palliative care - (2 months)

During II year, students are encouraged to undergo special postings for learning new advanced techniques / Procedure / Skills in institutions of higher repute where the requisite facilities are available without affecting the duties of the parent department.

4 .SKILL TRAINING:

During the period of 3 years, the student is expected to assist/perform under supervision, the following procedures in various disciplines:

Breast & Gynaecology:

Extrafascial hysterectomy

Wertheim's hysterectomy

Modified radical mastectomy

Breast conservation surgery

Pelvic lymphadenectomy

Sentinel node biopsy

Cytoreductive surgery for

ovarian/endometrial cancer
Simple or modified radical vulvectomy
Pelvic exenterations.

Head & Neck:

Laryngectomy
Oral resections
Laryngopharyngo esophagectomy
Parotidectomy, thyroidectomy
Neck dissection- radical/ modified
radical/ selective
Composite resection
Myocutaneous flaps
Local flaps in head and neck

Thoracic oncology

Lobectomy and pneumonectomy
3 field lymphadenectomy Ca esophagus
Transhiatal esophagectomy
Lung metastatectomy

Urology:

Ilio inguinal block dissection
Radical cystectomy with conduit/
neobladder
Radical prostatectomy
Retroperitoneal lymph node dissection
Radical nephrectomy
Total penectomy, Partial penectomy, Emasculations.
Sentinel node biopsy for penile cancer

Musculoskeletal and Cutaneous Oncology

Limb salvage surgery for extremity sarcomas
Hemipelvectomy.
Shoulder resection
Internal hemipelvectomy - different types
Sacrectomy- All types.
Amputation- all types
Soft tissue sarcoma- wide excision, Muscle group excisions, Compartmental
resections.
Cutaneous tumour- wide excision and node dissections.
Wide excision of soft tissue sarcoma of different types including vascular
resections and grafting.
Wide excision of cutaneous tumour with
SLN biopsy for melanoma.

Gastrointestinal

Abdominoperineal resection (standard and extralevator)
 (Low) anterior resection
 Inter sphincteric resection rectum
 Radical Gastrectomy with D2 lymph adenectomy
 Hepatic resections- major/metastatectomy
 Whipple's pancreaticoduodenectomy
 Hemicolectomies.
 Any other surgeries as per availability during the period of training.

Besides the above, the student will also be taught to independently perform the following procedures:

Biopsies- Node, Trucut, Wedge, Incisional
 Dilation and curettage
 Colposcopy
 Central line/ chemoport insertion
 Tracheostomy, colostomy, ileostomy.

5 .TEACHING METHODOLOGY:

1. Classroom lectures- twice a week
2. Clinical case presentation- once a week
3. OP clinics- twice a week
4. Performance of surgery
5. Per-operative teaching sessions- 4 days a week
6. Debate- once in 3 months
7. Clinico Pathological Conference- once a week
8. Seminar- once in 3 months
9. Grand Rounds- once in 3 months
10. CME- once in 3 months
11. Tumour Boards- twice a week
12. Journal club - once in a month
13. Trials discussion- once in a month

6 . RESEARCH WORK:

During the period of the course, the student is taught the fundamentals of clinical and basic sciences research. This includes:

1. Basic knowledge of clinical research methods, biostatistics, epidemiology and ethics.
2. Basic knowledge of cell biology, molecular biology, molecular genetics and immunology
3. Critical analysis of current literature, ability to formulate research questions, make a study design, calculate sample size, data management, ways to avoid bias etc.
4. Preparation of proposals for funding and evaluation by institutional review boards

5. Presentation of work in written/oral form at Conferences
6. Help mentors in peer review of articles submitted for publication.

Students should compulsorily attend Research Methodology workshop conducted by the University within first six months of M.Ch Course.

7 .LOG BOOK:

The Postgraduate student of a Postgraduate Degree Course in Super specialties shall maintain Log Book of the work carried out by them and the training programme undergone during the period of training including details of surgical operations assisted or done independently.

The Log Book shall be checked and assessed by the faculty members imparting the training.

Periodical evaluation of Log Book to be done by the Head of the Department as per 52nd SAB.

The Evaluation of the candidates in both theory and practical aspects will help the candidate in the improvement of his/her knowledge skills & attitude.

8. COMPETENCY ASSESSMENT:

Overall:

1. Communication / Commitment / Contribution /		
Compassion towards patients and Innovation	-	10 Marks
2. Implementation of Newly learnt techniques	-	10 Marks
3. Documentation of case sheets / discharge		
Summary / Review	-	10 Marks
4. Number of cases presented in Clinical Meetings/Journal		
Clubs / Seminars / Papers presented in Conference.	-	10 Marks
5. No. Of Medals/ Certificates won in the conference / Quiz		
competitions and other academic meetings with details.	-	10 Marks

Total		50 Marks

Assessment	I	- February	-	First Year
	II	- August	-	First Year
	III	- February	-	Second Year
	IV	- August	-	Second Year
	V	- February	-	Third Year
	VI	- May	-	Third Year

VIVA INCLUDING COMPETENCY ASSESSMENT - 100 Marks (50+50)

9 .THEORY EXAMINATION:

Paper I	- Basic Sciences as applied to Surgical Oncology
Paper II	- Surgical Oncology I
Paper III	- Surgical Oncology II
Paper IV	- Recent Advances in Surgical Oncology

Each paper will contain:

1. Essay questions (2) - 2 X 15 = 30 Marks
2. Short Notes (10) - 10 X 7 = 70 Marks

Total 100 Marks

10 .PRACTICAL EXAMINATION SCHEME:

Particulars	Time for candidate to examine the cases	Time for examiners to question the candidates	Maximum Marks
Long Case	1 Case x 60 Minutes	60 Minutes	100
Short Case	2 Cases x 15 Minutes	30 Minutes	100
Ward Rounds	3 Patients x 10 Minutes	30 Minutes	100
OSCE	5 Stations x 3 Minutes	15 Minutes	50
Viva Voce		15 Minutes	100
Log Book			50
Total			500

“13.9 A Postgraduate student of a Postgraduate degree Course in broad specialties/Super Specialties would be required to present one poster presentation to read one paper at a National/State conference and to present one Research paper which should be published/accepted for publication/sent for publication during the period of his Postgraduate studies so as to make him eligible to appear at the Postgraduate Degree Examination”.

Apart from Poster/Oral paper presentation in National/State conferences, the Research paper published by the candidate in the University Journal of Medical Sciences will be considered as equivalent to the Research Paper as mentioned in 13.9. clause. Case Reports can also be published in University Journal of Medical Sciences but case reports will not be considered as Research Paper.

The candidate can also present Research Paper as per Clause 13.9 of Post Graduate Education Regulation 2000, and if the article sent for publication by the candidate as primary author or corresponding author which has not yet been published/accepted for publication, the candidate should submit a letter from the HOD, stating that the article sent for publication is of publishable merit and the proof of the Research Article submitted to the Journal for publication should be sent to the university forwarded through the HOD [as per 53rd SAB]

The student can submit articles for the University journal anytime from the time of registration till 6 months prior to theory examination.

11. OSCE (5 stations):

1. Clinical Scenario with clinical details - (2 stations)
2. Operative Surgery- Video/Photograph (1 station)
3. Clinical Photograph (1 station)
4. Photographs of Endoscopic findings/ Equipment or any other finding (1 station)

12 .RECOMMENDED REFERENCE BOOKS:

GENERAL

DEVITA (Vincent Devita, Hellman and Rosenberg's Cancer: Principles and practice of Oncology Ed.10

BREAST BLAND (Kirby) and COPELAND III (Edward M)

Breast: Comprehensive management of benign and malignant diseases Ed.4

GYNECOLOGY

BEREK (Jonathan S) and HACKER (Neville)
 Berek and Hacker's Gynecologic Oncology Ed.6
 BARKAT (Richard R)
 Principles and practice of gynaecologic oncology Ed.5

HEAD AND NECK

WATKINSON (John C) and GILBERT (Ralph W)
 Stell and Maran's textbook of Head and Neck surgery and oncology Ed. 5
 SHAH (Jatin) Jatin Shah's head and Neck surgery and Oncology Ed.4
 MYERS (Eugene)
 Skull Base surgery: Master techniques in
 otolaryngology - Head and neck surgery

UROLOGY WEIN (Alan J) Ed Campbell- Walsh Urology Ed. 10

BONE AND SOFT TISSUE

MALAWER (Martin M) et al
 Operative techniques orthopaedic, Oncology, CANALE (Terry S) and BEATY (James)
 Campbell's operative Orthopedics Ed.12

HEPATO BILIARY BLUMGART (Leslie H) Ed

Surgery of the Liver, Biliary Tract., and Pancreas Ed. 4

GASTROINTESTINAL

YEO (Charles J) Shackelford's surgery of the alimentary tract. Ed. 7

****Note:** The editions are as applicable and the latest editions shall be the part of the syllabi.

13 .RECOMMENDED JOURNALS FOR READING:

1. Indian Journal of Surgical Oncology
2. Indian Journal of Cancer
3. Journal of Surgical Oncology
4. Annals of Surgical Oncology
5. European Journal of Surgical Oncology
6. Surgical Oncology Clinics of North America
7. Surgical Clinics of North America
8. Journal of Clinical Oncology
9. Seminars in Oncology
10. British Journal of Surgery
11. Lancet oncology
12. Lancet
13. New England Journal of Medicine
