

**Paper II: Technical Subject**

**1. Pharmacology of Medicines Used in Cancer Treatment**

- 1.1. Classification of chemotherapy medicines in different groups
- 1.2. Plant alkaloids: Mechanism of Action, Pharmacokinetics, Uses, Precautions, Side effects, Interactions, Doses in different Regimens
- 1.3. Alkylating agents: Mechanism of Action, Pharmacokinetics, Uses, Precautions, Side effects, Interactions, Doses in different Regimens
- 1.4. Antimetabolites: Mechanism of Action, Pharmacokinetics, Uses, Precautions, Side effects, Interactions, Doses in different Regimens
- 1.5. Antitumor antibiotics: Mechanism of Action, Pharmacokinetics, Uses, Precautions, Side effects, Interactions, Doses in different Regimens
- 1.6. Topo-isomeraseinhibitors: Mechanism of Action, Pharmacokinetics, Uses, Precautions, Side effects, Interactions, Doses in different Regimens
- 1.7. Proteosome inhibitors: Mechanism of Action, Pharmacokinetics, Uses, Precautions, Side effects, Interactions, Doses in different Regimens
- 1.8. Corticosteroids
- 1.9. Prevention and management of extravasation of chemotherapy

**2. Cancer of Various Systems: Solid Tumour**

- 2.1. Bone and soft tissue sarcomas
- 2.2. Respiratory System
- 2.3. GI Malignancies
- 2.4. Genitourinary malignancies
- 2.5. CNS Tumors
- 2.6. Cancer of breast
- 2.7. Cancer of skin
- 2.8. Cancer of endocrine system
- 2.9. Mesotheliomas
- 2.10. Gynaecologic cancers
- 2.11. Hepato-Biliary & Pancreatic Tumors
- 2.12. Malignant Melanoma
- 2.13. Cancer of Unknown Primary
- 2.14. Cardio-Vascular Malignancies
- 2.15. Head and Neck Cancer

**3. Haematological Malignancies:**

- 3.1. Myelodysplastic Syndrome:
  - 3.1.1. Staging, prognostic factors, natural history
  - 3.1.2. French-American-British classification
  - 3.1.3. Chromosomal abnormalities, Prognostic factors, International Prognostic Scoring System
  - 3.1.4. Treatment

- 3.1.5. Current recommendations
- 3.1.6. Low-intensity therapy
- 3.1.7. High-intensity therapy
- 3.1.8. Bone marrow/stem cell transplantation
- 3.1.9. Supportive care
- 3.2. Acute Leukemias
  - 3.2.1. Epidemiology
  - 3.2.2. Pathogenesis, pathology and tumor biology
  - 3.2.3. Diagnosis
  - 3.2.4. Acute myeloid leukemia
  - 3.2.5. Staging, prognostic factors, natural history& treatment
  - 3.2.6. Acute lymphoblastic leukemia
  - 3.2.7. Staging, prognostic factors, natural history& treatment
- 3.3. Chronic Leukemias: Chronic Myeloid Leukemia (CML) and Chronic Lymphocytic Leukemia (CLL)
  - 3.3.1. Epidemiology
  - 3.3.2. Pathogenesis, pathology and tumor biology
  - 3.3.3. Diagnosis
  - 3.3.4. Staging and prognostic factors
  - 3.3.5. Treatment
- 3.4. Hodgkin' Lymphoma
  - 3.4.1. Epidemiology
  - 3.4.2. Pathogenesis, pathology and tumor biology
  - 3.4.3. Diagnosis& Classification
  - 3.4.4. Staging investigations and prognostic factors
  - 3.4.5. Treatment by stage
- 3.5. Non-Hodgkin' Lymphomas
  - 3.5.1. Epidemiology
  - 3.5.2. Pathogenesis, pathology and tumor biology
  - 3.5.3. Diagnosis & Classification
  - 3.5.4. Staging investigations and prognostic factors
  - 3.5.5. Treatment by stage
- 3.6. Plasma cell Dyscrasias
  - 3.6.1. Epidemiology
  - 3.6.2. Pathogenesis, pathology and tumor biology
  - 3.6.3. Diagnosis
  - 3.6.4. Criteria for the different plasma cell dyscrasias
  - 3.6.5. Staging and prognostic factors
  - 3.6.6. Treatment by stage and type
  - 3.6.7. Myeloproliferative disorders
  - 3.6.8. Polycythemia vera (PV)
  - 3.6.9. Essential thrombocythemia (ET)
  - 3.6.10. Myelofibrosis (MF)

3.7. Radiation Oncology

- 3.7.1. Type of rays used in cancer treatment and their Characteristics
- 3.7.2. Type of Machine used in Department of Radiation Oncology
- 3.7.3. Interaction of radiation with different type of tissue
- 3.7.4. Radiation protection
- 3.7.5. Cell cycle
- 3.7.6. Immobilization devices
- 3.7.7. Time, dose and fractionation

3.8. Palliative Medicine

3.9. Stem cell transplant

- 3.9.1. Indications, Sources of stem cells Preparative regimen
- 3.9.2. Complications

**4. Childhood Cancers and Their Management**

- 4.1. CNS tumors
- 4.2. Bone and soft tissue sarcomas
- 4.3. PNET tumors
- 4.4. Lymphoma and leukemias in children

**5. Manifestation of Complications of Cancer and Cancer Treatment in Various Systems and Their Management**

- 5.1. Haematological complications
- 5.2. Renal complications
- 5.3. GI related complications
- 5.4. Infection and sepsis
- 5.5. Para- Neoplastic syndrome
- 5.6. Cardiovascular complications
- 5.7. Respiratory Complications
- 5.8. CNS complications
- 5.9. Metabolic Complications
- 5.10. Neuromuscular complications
- 5.11. Bone and joint complications

**6. Preventive Oncology**

- 6.1. Epidemiology
- 6.2. Primary prevention (cancer awareness, cancer education, vaccination )
- 6.3. Secondary prevention (screening, screening methods)

**7. Cancer Diagnostics**

- 7.1. Radiological diagnostics
- 7.2. Molecular and cytogenetics
- 7.3. Cytological and Histopathological diagnostics
- 7.4. Biochemical Diagnostics

- 7.5. Tumor markers, IHC (Immunohistochemistry), Flowcytometry
- 7.6. Nuclear and Radionuclear imaging
- 7.7. Interventional Radiology

## **8. Recent Advances in Cancer Management**

- 8.1. Essentials of molecular biology
- 8.2. Molecular biology of cancer
- 8.3. Newer approaches in cancer

## **9. AIDS-Related Malignancies**

- 9.1. Epidemiology, Pathogenesis, pathology and tumor biology
- 9.2. Diagnosis
  - 9.2.1. HIV
  - 9.2.2. HIV-associated malignancy : Kaposi's sarcoma, Systemic lymphoma, Primary CNS lymphoma, Cervical cancer
  - 9.2.3. Non-AIDS defining malignancies: Anogenitalneoplasia & Other malignancies
- 9.3. Staging : Kaposi's sarcoma, Systemic lymphoma, Primary CNS lymphoma, Cervical cancer
- 9.4. Treatment and follow-up : Kaposi's sarcoma, Systemic lymphoma, Primary CNS lymphoma, Cervical cancer
- 9.5. Special issues
  - 9.5.1. Antiretroviral therapy
  - 9.5.2. Infection prophylaxis
  - 9.5.3. Colony stimulating factors

## **10. Palliative Care**

- 10.1. Introduction and basic concept including definition
- 10.2. Cancer Pain: Definition, etiology, physiology, types & assessment of cancer pain
- 10.3. Total Cancer Pain Management; Pharmacological management of cancer pain; Balanced use of morphine and other opioids to treat cancer pain; WHO three steps Analgesic Ladder vs two steps Analgesic Ladder
- 10.4. Non-pharmacological management of cancer pain
- 10.5. Common symptom management
- 10.6. Communication skill & breaking bad news
- 10.7. Ethical issues in Palliative care
- 10.8. Psycho social issues
- 10.9. End of Life care
- 10.10. Hospices in Nepal

## **11. Oncological Emergencies:**

- 11.1. Metabolic: Tumor Lysis Syndrome, Hypercalcemia, SIADH
- 11.2. Infective: Febrile Neutropenia, Septic Shock
- 11.3. Neurological: Spinal Cord Compression, Brain Metastasis
- 11.4. Cardiovascular: SVC Obstruction, Malignant Pericardial Effusion

11.5. Hematological: Hyperviscosity, Hyperleukocytosis, Disseminated Intravascular Coagulation (DIC)

## **12. Research Methodology and Scientific Paper Publication**

12.1. Planning and Conducting Research in different aspect of cancer

12.2. Introduction, literature review, Methodology, Study designs, variables, sampling, data collection

12.3. Biostatistics, probability, Hypothesis, Hypothesis testing, estimation, Descriptive and non descriptive statistics, correlation and regression

12.4. Clinical Trials: Types and significance

-----

पाठ्यक्रम लागु मिति: २०७४/०४/०५