Oncology

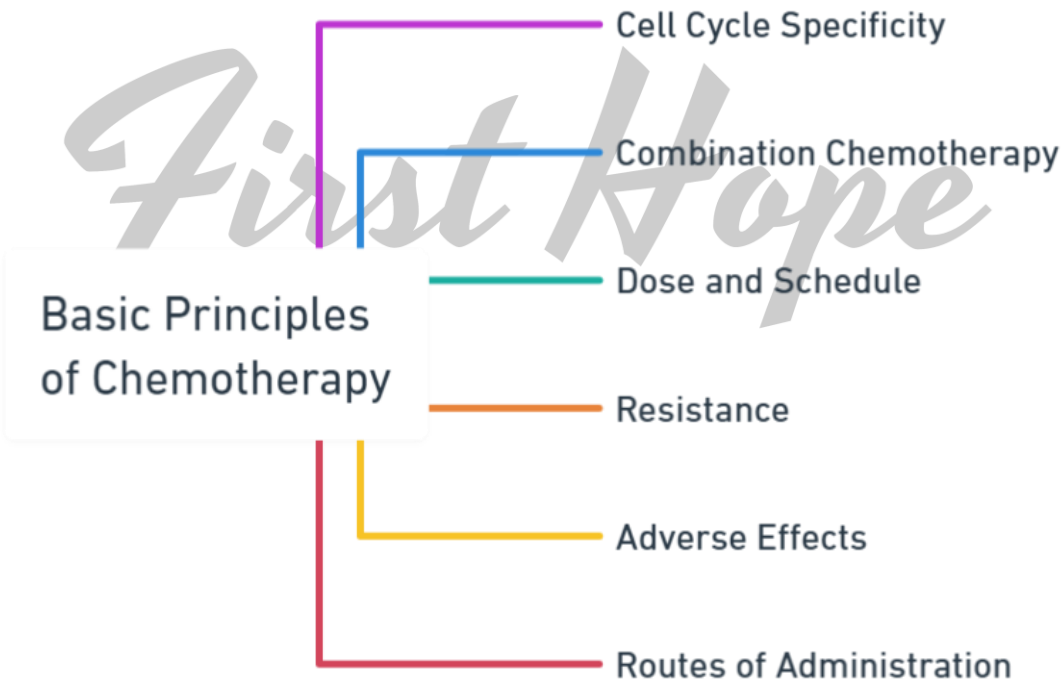
General Principles of Cancer Chemotherapy (Pharmacotherapeutics)

- **Cancer chemotherapy** involves the use of drugs to destroy or inhibit the growth of cancer cells.
- These drugs target rapidly dividing cells but may also affect normal cells.

Goals of Chemotherapy

- Cure cancer (complete eradication)
- Control tumor growth
- Palliation (relieve symptoms)
- Preventing metastasis

Basic Principles



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1. **Cell Cycle Specificity**
   - **Some drugs act on specific phases:**
     - S-phase: Antimetabolites (e.g., Methotrexate)
     - M-phase: Vinca alkaloids
   - Others are cell cycle non-specific (e.g., Alkylating agents)
2. **Combination Chemotherapy**
   - Use of multiple drugs with different mechanisms
   - **Advantages:**

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- Increased efficacy
- Reduced resistance
- Lower toxicity (using lower doses of each)

3. Dose and Schedule

- Given in cycles (e.g., every 3 weeks)
- Allows recovery of normal cells
- Dose based on body surface area (BSA)

4. Resistance

- **Cancer cells may become resistant due to:**
  - Drug inactivation
  - Efflux pumps (P-glycoprotein)
- Combination therapy helps prevent resistance

5. Adverse Effects (Due to effect on rapidly dividing cells)

- **Bone marrow suppression:**
  - Anemia
  - Leukopenia
  - Thrombocytopenia
- **Gastrointestinal toxicity:**
  - Nausea, vomiting
  - Mucositis
- Hair loss (alopecia)

6. Routes of Administration

- Intravenous (most common)
- Oral
- Intrathecal (for CNS cancers)

Monitoring Parameters

- Complete blood count (CBC)
- Liver and kidney function
- Tumor markers
- Imaging studies

Patient-Specific Considerations

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- Age
- Nutritional status
- Organ function
- Performance status

Important Clinical Points

- Narrow therapeutic index
- Requires careful monitoring
- Supportive care is essential

Pharmacotherapy of Breast Cancer

- Breast cancer is one of the most common cancers in women.
- **Treatment depends on:**
  - Hormone receptor status (ER/PR)
  - HER2 status
  - Stage of disease

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Goals of Therapy

- Cure (early stage)
- Prevent recurrence
- Control metastatic disease

Types of Therapy



1. Hormonal Therapy (for hormone receptor-positive cancers)

- **Selective Estrogen Receptor Modulators (SERMs)**
  - Tamoxifen
  - Blocks estrogen receptors
- **Aromatase Inhibitors**
  - Anastrozole, Letrozole

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- Reduce estrogen production

➢ **Indications**: ER/PR positive tumors

2. Chemotherapy

➢ **Common drugs:**

- Cyclophosphamide
- Doxorubicin
- Paclitaxel

➢ **Used in:** Advanced or aggressive cancers

3. Targeted Therapy

➢ **HER2-positive cancer**

- Trastuzumab
- Mechanism: Targets HER2 receptor

4. Combination Regimens

➢ **Example:** AC-T regimen (Adriamycin + Cyclophosphamide → Paclitaxel)

Adverse Effects

- **Tamoxifen:**
  - Risk of endometrial cancer
  - Thromboembolism
- **Trastuzumab:** Cardiotoxicity
- **Chemotherapy:** Myelosuppression, alopecia

Monitoring Parameters

- Tumor size
- Cardiac function (with trastuzumab)
- Hormone receptor status

Patient-Specific Considerations

- Menopausal status
- Risk of recurrence
- Comorbidities

Important Clinical Points

- Personalized therapy based on receptor status
- Long-term hormonal therapy may be required

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Pharmacotherapy of Lung Cancer

Definition and Overview

- Lung cancer is a malignant tumor arising from lung tissues.
- **Two major types:**
  - Non-Small Cell Lung Cancer (NSCLC) (most common)
  - Small Cell Lung Cancer (SCLC) (more aggressive)

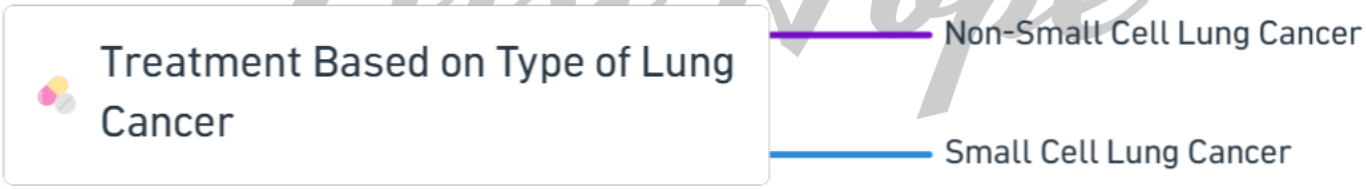
Etiology / Risk Factors

- Smoking (most important)
- Air pollution
- Occupational exposure (asbestos)

Goals of Pharmacotherapy

- Cure (early-stage disease)
- Control tumor growth
- Relieve symptoms (palliative care)

Treatment Based on Type



A. Non-Small Cell Lung Cancer (NSCLC)

a) Chemotherapy

- **Drugs:**
  - Cisplatin / Carboplatin
  - Paclitaxel
  - Docetaxel
- Used in advanced stages

b) Targeted Therapy

- **Based on genetic mutations:**

a) **EGFR inhibitors**

- Erlotinib, Gefitinib

b) **ALK inhibitors**

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