Principles of Cancer Treatment
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Oncology Clinical Nurse Specialist
Seattle Cancer Care Alliance

Objectives
- Describe the principles of cancer treatment
  - Surgery
  - Chemotherapy
  - Biotherapy & Targeted Therapy
  - Complementary and Alternative Medicine

Cancer Treatment Modalities
- Surgery
- Chemotherapy
- Biotherapy & Targeted Therapy
- Radiation Therapy
- Hematopoietic Stem Cell Transplant
- Complementary and Alternative Medicine (CAM) Therapies

Cancer Treatment Modalities
- Surgery
- Chemotherapy
- Biotherapy & Targeted Therapy
- **Radiation Therapy**
- **Hematopoietic Stem Cell Transplant**
- Complementary and Alternative Medicine (CAM) Therapies
Surgery in Cancer Therapy

Role of Cancer Surgery

- Establish tissue diagnosis
- Determine stage of disease
- Curative treatment
- Preventive treatment
- Palliative treatment

Establishing Tissue Diagnosis

- Tumor sample obtained to confirm diagnosis and to determine specific type of cancer (histology)
- Variety of biopsy techniques available
  - Provide sufficient tissue for pathologic and histologic diagnosis

Surgery to Treat Disease

Curative Treatment

- Resection of primary tumor to provide curative results.
- May need neoadjuvant or adjuvant therapy for optimum results.
- Localized tumors resected with adequate margins (i.e. lobectomy, mastectomy, hysterectomy)

Preventive Treatment

- Prophylactic surgery to reduce risk of cancer in high-risk patients
  - Ulcerative colitis: Colon cancer – colectomy
  - BRCA mutations
    - Breast cancer – bilateral mastectomies
    - Ovarian cancer – bilateral salpingo-oophorectomy
  - MEN2A, MEN2B mutations
    - Multiple endocrine neoplasia and thyroid carcinoma - thyroidectomy

**Surgery to Treat Disease**

- **Palliative Therapy:**
  - Promote comfort & QOL without goal of curing disease
  - Requires assessment of the relative risk-to-benefit ratio
  - Examples include:
    - Resection of primary tumor to alleviate pain or bleeding
    - Bowel resection for relief of obstruction
    - Bone stabilization

**Role of Nursing & Surgical Team**

- Expert assessment
- Psychosocial support
- Education
- Symptom management
- Prevention of complications

**Chemotherapy**

- **Cell Life Cycle**
  - **G-0 Phase (G = Gap)**
    - Resting (cells not committed to cell division)
  - **G-1 Phase**
    - Enzymes produced in preparation for DNA synthesis & RNA synthesis
  - **S Phase (S = Synthesis)**
    - DNA synthesized inside the nucleus
  - **G-2 Phase**
    - RNA & protein synthesis occurs, DNA synthesis ends
  - **M Phase (M = Mitosis)**
    - Cellular division


**Action of Antineoplastic Drugs**

- Alter cellular activity during one or more phases of cell cycle
- Affects *both* normal & malignant cells

**Classification of Chemotherapy**

<table>
<thead>
<tr>
<th>Phase of Action During Cell Cycle</th>
<th>Pharmacologic Classifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cell Cycle Specific</td>
<td>Alkylation agents</td>
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<tr>
<td>Cell Cycle Non-specific</td>
<td>Nitrosureas</td>
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<td></td>
<td>Antitumor antibiotics</td>
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<td></td>
<td>Antimetabolites</td>
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<td>Plant Alkaloids (Mitotic inhibitors)</td>
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<td>Vinca alkaloids</td>
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<td>Taxanes</td>
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<td></td>
<td>Epipodophyllotoxins</td>
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<td></td>
<td>Topoisomerase I inhibitors</td>
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</tbody>
</table>

**Phase of Action During Cell Cycle**

- Cell Cycle Specific agents
- Cell Cycle *Non*-specific agents

**Cell Cycle Specific Agents**

- Exerts effect only in specific phases of cell cycle
- Most effective against rapidly proliferating (cycling) cells
- Cell kill dependent on schedule (duration & timing rather than dose)
Cell Cycle Non-Specific Agents

- Affect cells in all phases of the cell cycle (including G0).
- Both proliferating and nonproliferating cells are killed.
- Cell kill dependent on total dose rather than schedule.
- Combined with cell cycle-specific agents.

Pharmacologic Classifications

Cell Cycle Non-specific

- Alkylating agents
- Nitrosoureas
- Antitumor antibiotics

Cell Cycle Specific

- Antimetabolites
- Plant Alkaloids (Mitotic inhibitors)
- Vinca alkaloids
- Taxanes
- Topoisomerase inhibitors

Alkylating Agents

- Cell cycle non-specific
- Break DNA helix, interfere with DNA replication
- Examples of alkylating agents:
  - Cyclophosphamide (Cytoxan)
  - Ifosfamide (Ifex)
  - Cisplatin (Platinol)
  - Carboplatin (Paraplatin)
  - Oxaliplatin (Eloxatin)
  - Temozolomide (Temodar)

Alkylating Agents Toxicities

- Hematopoietic
  - Myelosuppression
- GI
  - Nausea/vomiting
- Reproductive
  - Azospermia, amenorrhea
- Integumentary
  - Alopecia
- Carcinogenic
  - Secondary malignancies
- Hemorrhagic cystitis
  - Ifosfamide, cyclophosphamide
- Neuropathy
  - Cisplatin analogs
- Hypersensitivity
  - Carboplatin (after 6-7 doses)
**Nitrosureas**

- Cell cycle non-specific
- Breaks DNA helix, interferes with DNA replication
- Cross blood-brain barrier

**Examples of Nitrosureas:**
- Carmustine (BICNU)
- Lomustine (CeeNu)
- Streptozocin (Zanosar)

**Nitrosureas Toxicities**

- **Hematopoietic**
  - Delayed myelosuppression
  - Nadir 4-6 weeks after therapy starts
- **GI**
  - Severe nausea/vomiting

**Antitumor Antibiotics**

- Cell cycle non-specific (most agents)
- Binds with DNA, inhibits DNA & RNA synthesis

**Examples of antitumor antibiotics**
- Actinomycin D (dactinomycin, Cosmegen)
- Bleomycin (Blenoxane)
- Mitomycin (Mutamycin)
- Mitoxantrone (Novantrone)
- Anthracycline Antitumor antibiotics
  - Daunorubicin (Daunomycin)
  - Doxorubicin (Adriamycin)
  - Epirubicin (Elence)
  - Idarubicin (Idamycin)
  - Liposomal doxorubicin (Doxil)
  - Liposomal daunorubicin (DaunoXome)

**Antitumor Antibiotics Toxicities**

- **Hematopoietic**
  - Myelosuppression (all drugs except Bleomycin)
- **GI**
  - Nausea/vomiting
  - Stomatitis, mucositis
- **Reproductive**
  - Gonadal suppression
- **Integumentary**
  - Alopecia
  - Vesicants (except Bleomycin, Mitoxantrone, and liposomal anthracyclines)
- **Cardiotoxicity**
  - Anthracycline antibiotics (dose dependent)
- **Pulmonary fibrosis**
  - Bleomycin
### Common Chemotherapy Agents

<table>
<thead>
<tr>
<th>Phase of Cell Cycle</th>
<th>Class</th>
<th>Common Agents</th>
<th>Common Toxicities</th>
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</thead>
<tbody>
<tr>
<td>Nonspecific Agents</td>
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<tr>
<td>Alkylating Agents</td>
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<td>Cyclophosphamide</td>
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<td>Ifosfamide</td>
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<td>Carboplatin</td>
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<td>Oxaliplatin</td>
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<tr>
<td>Temozolomide</td>
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<tr>
<td>Nitrosoures</td>
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<tr>
<td>Carmustine</td>
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<tr>
<td>Lomustine</td>
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<td>Antitumor Antibiotics</td>
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<tr>
<td>Actinomycin D</td>
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<tr>
<td>Bleomycin</td>
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<tr>
<td>Mitomycin</td>
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<td>Mitozantrone</td>
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<td>Anthracytine</td>
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<td>Capecitabine</td>
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<td>Methotrexate</td>
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<tr>
<td>Pemetrexed</td>
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<tr>
<td>Gemcitabine</td>
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</tbody>
</table>

### Pharmacologic Classifications

#### Cell Cycle Specific Agents

- **Antimetabolites**
  - Cell cycle specific (S Phase)
  - Mimics & incorrectly substitutes for metabolites (nutrients) needed for cellular function (e.g. folate)
  - **Antimetabolite examples**
    - Azacitidine (Vidaza)
    - Cytosine arabinoside (Cytarabine/Ara C)
    - Fluorouracil (5-FU)
    - Capecitabine (Xeloda)
    - Methotrexate (Mexate)
    - Pemetrexed (Almita)
    - Gemcitabine (Gemzar)

- **Plant Alkaloids (Mitotic inhibitors)**
  - Vinca alkaloids
  - Taxanes
  - Epipodophylotoxins
  - Topoisomerase I inhibitors

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Antimetabolite Toxicities

- **Hematopoietic**
  - Myelosuppression
- **GI**
  - Nausea, vomiting
  - Mucositis/stomatitis
  - Diarrhea
- **Integumentary**
  - Capecitabine: "Hand/foot syndrome" (palmar-plantar erythrodysesthesia)
  - 5FU: photosensitivity
- **Ocular toxicity**
  - Ara-C high-dose: keratitis
  - 5FU: photosensitivity


Plant Alkaloids (Mitotic Inhibitors)

- Vinca alkaloids
- Taxanes
- Epipodophylotoxins

Vinca Alkaloids

- Acts in late G2 & M phase
- Prevents formation of mitotic spindle (prevents cell mitosis)

**Examples of Vinca Alkaloids**
- Vinblastine (Velban)
- Vincristine (Oncovin)
- Vinorelbine

Vinca Alkaloid Toxicities

- **Hematopoietic**
  - Myelosuppression (except vincristine)
- **GI**
  - Nausea/vomiting (except vincristine)
- **Integumentary**
  - All are vesicants
  - Alopecia
- **Neurotoxicity**
  - Sensory-motor peripheral neuropathy
  - Constipation (autonomic neuropathy)
**Epipodophyllotoxins**

- Interferes with topoisomerase II enzyme reaction
- Acts in late G2 & S phase
- **Examples of Epipodophyllotoxins:**
  - Etoposide (VP-16, VePesid)
  - Teniposide (VM-26, Vumon)

**Epipodophyllotoxin Toxicities**

- **Myelosuppression**
- **GI**
  - Nausea/vomiting
  - Mucositis (high-dose etoposide)
  - Diarrhea (high-dose etoposide)
- **Cardiovascular**
  - Hypotension if infused too rapidly

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**Taxanes**

- Inhibits cell division in G2 & M phase
- Promotes early microtubule assembly and prevents disassembling, arresting mitosis
- **Examples of Taxanes:**
  - Docetaxel (Taxotere)
  - Paclitaxel (Taxol)
  - Paclitaxel Protein-bound particles (Abraxane)

**Taxane Toxicities**

- **Hematopoietic**
  - Myelosuppression
- **GI**
  - Nausea/vomiting
- **Integumentary**
  - Alopecia
  - Vesicants (paclitaxel & docetaxel classified by ONS)
- **Neurologic**
  - Sensory-motor peripheral neuropathy
  - Arthralgia & myalgias
- **Hypersensitivity reactions**
  - Paclitaxel & docetaxel
Camptotecans (Topoisomerase I inhibitors)

- Cell cycle phase specific
- Acts in S phase to prevent unwinding of DNA strand (by inhibiting topoisomerase I)

**Examples of Camptotecans**
- Irinotecan (Camptosar)
- Topotecan (Hycamtin)

**Camptotecan (Topoisomerase I Inhibitor) Toxicities**

- Hematopoietic: Myelosuppression
- GI: Early diarrhea (cholinergic – reversed with atropine), Late diarrhea (motility)
- Integumentary: Alopecia

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<td>Vinca Alkaloids</td>
<td>Vinblastine (Velban)</td>
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<td>Taxanes</td>
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<td>Hematopoietic, GI, Integumentary, Neurologic, Hypersensitivity</td>
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<td>Camptotecans</td>
<td>Irinotecan (Camptosar)</td>
<td>Hematopoietic, GI, Integumentary</td>
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### Hormonal Agents

Interfere with protein synthesis & alter cell metabolism by changing cells' hormonal environment

- **Antiandrogens (nonsteroidal)**
  - Bicalutamide (Casodex)
  - Flutamide (Eulexin)

- **Antiandrogens (nonsteroidal aromatase inhibitor, reversible)**
  - Anastrozole (Arimidex)
  - Letrozole (Femara)

- **Antiandrogens (nonsteroidal aromatase inhibitor, irreversible)**
  - Exemestane (Aromasin)
  - Tamoxifen (Nolvadex)

- **Antiandrogens (receptor antagonist)**
  - Fulvestrant (Faslodex)

- **Antiandrogens (steroidal aromatase inhibitor, irreversible)**
  - Estrogens
  - Estradiol (Estrace)
  - Estramustine (Emcyt)
  - Estrogen (Menex)

- **Luteinizing hormone-releasing hormone analog**
  - Goserelin acetate (Zoladex)
  - Leuprolide acetate (Lupron)
### Routes of Chemotherapy Administration

- Intra-arterial
- Oral
- Subcutaneous
- Intrathecal/intraventricular
- Intraperitoneal
- Intrapleural
- Intravesicular
- Intravenous

### Oral

**Advantage:**
- Convenience
- Ease and portability
- Increase sense of independence

**Disadvantage:**
- Difficulties with adherence
- Inconsistency of absorption
- Potential drug-herb-diet interactions
- Adherence
- Cost/reimbursement

### SC or IM Injection

**Advantages**
- Ease of administration
- Decreased side effects

**Disadvantages**
- Inconsistency of absorption
- Requires adequate muscle mass & tissue absorption

**Nursing implications**
- Wear appropriate PPE
- Monitor Platelet count and ANC
- Assess previous injection site for signs and symptoms of infection or bleeding

### Intrathecal/Intraventricular

**Advantage**
- Consistent drug level in CSF
- Bypasses the blood-brain barrier
- Sample CSF
- Administer opiates and antibiotics

**Disadvantage**
- Requires lumbar puncture or surgical placement
- Requires a physician or specially trained RN

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**Intraperitoneal**

**Advantages**
- Provides direct exposure
- Bypasses the cellular enclosure of the peritoneal cavity
- Allows instillation of radioactive or colloid materials
- Allows for cyclic treatments

**Disadvantage**
- Requires placement of peritoneal catheter or port
- Requires small enough tumor volume

**Intravenous**

**Advantages**
- Consistent absorption
- Required for vesicant

**Disadvantages**
- Requires nursing/patient time
- Interferes with patient’s activities

**Potential complications**
- Infection
- Phlebitis
- Infiltration
- Extravasation
- Local discomfort

**Principles of Cancer Treatment**

**Why is most chemotherapy administered in cycles?**

- For example:
  - Chemotherapy administered on day 1, repeated every 3 weeks for 6 cycles
  - Chemotherapy administered on day 1 & day 8, repeated every 3 weeks for 6 cycles

**Intrapleural**

**Advantage**
- Scleroses the pleural lining preventing recurrence of effusions

**Disadvantage**
- Requires insertion of chest tube
- Must be administered by a physician

**Potential complications**
- Pain
- Infection
Principles of Cancer Treatment: Cell Kill Hypothesis

A given dose kills a constant proportion of a tumor cell population (rather than a constant number of cells).

Implications of Cell Kill Hypothesis

- Early diagnosis & start to treatment is (obviously) helpful.
- Treatment must continue past the time when cancer cells can be detected using conventional treatment.
- **On time, full dose treatment** required to ensure sufficient log-kill obtained (curative tumors).

Factors Affecting Outcomes

<table>
<thead>
<tr>
<th>Tumor-Related</th>
<th>Patient-Related</th>
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<tbody>
<tr>
<td>Growth Fraction of Tumor</td>
<td>Performance status</td>
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<tr>
<td>Tumor burden</td>
<td>Bone Marrow Capacity</td>
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<tr>
<td>Type of cancer</td>
<td>Liver Function</td>
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<tr>
<td>Stage of disease</td>
<td>Kidney Function</td>
</tr>
<tr>
<td>Drug Resistance</td>
<td>Other Co-Morbidities</td>
</tr>
<tr>
<td>Age</td>
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</tbody>
</table>

Combination Chemotherapy

- Combine drugs with different mechanisms of action.
- Increases proportion of cells killed at any one time.
- Reduces drug resistance.
- Must have proven efficacy as single agents with minimally overlapping organ toxicity.
- Uses drug synergy to maximize effects.
### Goals of Cancer Therapy

- Prevention
- Cure
- Control
- Palliation

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### Chemotherapy Treatment Terms

**Adjuvant Therapy**
- Therapy given after the primary treatment modality such as surgery
- Example: adjuvant chemotherapy following lumpectomy for breast cancer
- **Rational for adjuvant therapy:**
  - Reduce risk of recurrence by eliminating small sites of disease or microscopic disease

**Neoadjuvant Therapy**
- Use of one or more treatment modalities prior to the primary treatment (i.e. chemotherapy prior to surgery)
- **Rational for neoadjuvant therapy:**
  - Decrease tumor size for surgical removal (shrink tumor prior to removal)
  - Evaluate effectiveness of chemotherapy (before surgery)
  - Shrink the tumor prior to removal

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### Hazardous Drug Safe Handling

Drugs defined as hazardous if they exhibit one or more of the following characteristics:

- Carcinogenicity
- Tetratogenicity or developmental toxicity
- Reproductive toxicity
- Organ toxicity at low doses
- Genotoxicity

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### Principles of Safe Handling

- Personal protective equipment
- Preparation in biologic safety cabinet with vertical laminar airflow
- Label as hazardous drugs
- Safe techniques during storage, transport, administration
Chemotherapy Dosing

- **Fixed dosing**: mg
- **Weight based dosing**: mg/kg
- **Body surface area (BSA) based dosing**: mg/m²
- **Area under the curve (AUC)**: Carboplatin
  - Calculation includes renal function

Verification of Dose Calculation

- Requires complete prescriber order
  - Height, weight, BSA or AUC, & total calculated dose
- Two chemotherapy-competent individuals (nurse and/or pharmacist), in addition to prescriber, independently double-check dosage calculations

Immediate Complications of Cytotoxic Therapy

- **Extravasation**
  - Vesicants
  - Irritant
- **Flare reaction**
- **Hypersensitivity reaction**
- **Anaphylaxis**

Chemotherapy Summary

- **Mechanisms of action**:
  - Interferes with DNA
  - Blocks cell replication in dividing cells (leading to cell death)
- **Affects**
  - Both normal and malignant cells
- **Chemotherapy toxicities related to effect on**:
  - Normal, frequently dividing cells
    - **Hematopoietic** (bone marrow suppression)
    - **GI mucosa** (nausea, vomiting, diarrhea)
    - **Reproductive** (amenorrhea, azoospermia)
    - **Integumentary** (alopecia)
  - **Drug-specific organ toxicities**
    - **Cardiac** (e.g. anthracycline antitumor antibiotics cardiomyopathy)
    - **Pulmonary** (e.g. Bleomycin pulmonary fibrosis)
    - **Neurons** (e.g. peripheral neuropathies)
**Chemotherapy Summary**
- Administered by multiple routes
- Typically administered over 4-6 “cycles”
- Classified as hazardous agents
  - Require special handling and use of personal protective equipment
- Most agents dosed according to body surface area
- Requires special training to:
  - Verify dose calculations
  - Safely handle & administer
  - Monitor, assess, and provide nursing actions to manage side effects

**Biotherapy & Targeted Therapies**

**Biotherapy**
- Use of agents:
  - Derived from biologic sources
    - That affect biologic responses.
  - Therapy that capitalizes on the use of natural body proteins and their functions to fight cancer.

**Types of Biotherapy**
- **Cytokines**
  - Interferons
  - Interleukins
  - Hematopoietic growth factors
  - A.K.A.: colony-stimulating factors or “CSF’s”
- **Targeted Therapies**
  - Monoclonal antibodies (injected agents)
  - Small Molecules (oral agents)
- **Antiangiogenesis agents**
  - Monoclonal antibody
  - Oral agents

References:
Cytokines

- Cytokines are a broad class of protein cell regulators produced by the immune system.
- Most cytokines possess multiple effects.
- Cytokines include:
  - Interferons
  - Interleukins
  - Hematopoietic growth factors

Interferons

- Actions:
  - Antiviral (inhibit viral replication)
  - Antiproliferative (prevent proliferation of tumor cells)
  - Immunomodulatory (modulate immune response of host)
- Examples:
  - Interferon alfa-2a (Roferon-A®)
  - Interferon alfa-2b (Intron A®)
- Side Effects:
  - Fever, chills, headache, N/V, diarrhea, fatigue, depression, anorexia, confusion, myelosuppression, injection site erythema

Interleukins

- Stimulate activation of immune cells (T and B cells, NK cells, LAK cells, tumor-infiltrating lymphocytes).
- Examples:
  - Aldesleukin (IL-2, Proleukin®)
  - Oprelvekin (IL-11, Neumega®)
- Side Effects:
  - Fever, chills, headache, N/V, diarrhea, myelosuppression, cardiac changes, capillary leak syndrome

Hematopoietic Growth Factors

- Stimulates the differentiation, proliferation, maturation, and functioning of hematopoietic cells.
- **Erythropoietic stimulating agents:**
  - Stimulate red blood cell production
    - Epoetin alfa (ProCrit®), Darbepoetin (Aranesp®)
- **Granulocyte colony stimulating factors (G-CSF):**
  - Regulates production of neutrophils
    - Filgrastim (Neupogen®), pegfilgrastim (Neulasta™)
- **Granulocyte macrophage colony stimulating factor (GM-CSF):**
  - Regulates differentiation neutrophils, monocytes, macrophages & dendritic cells
    - Sargramostim (Leukine®)
Targeted Therapies

- Advances in molecular biology led to development of “targeted therapies”
- Two types
  - Monoclonal antibodies
  - Small molecular inhibitors
    - Novel new agents
    - Oral therapies

Targeted Therapies

- Cellular growth, function, & apoptosis are regulated by complex network of biochemical & molecular signals
- Referred to as “cell signaling”
- “Signal transduction” is generation of a signal from either
  - Outside the cell (growth factors and growth factor receptors)
  - Inside the cell (tyrosine kinase inhibitors)
- Produces signaling cascade that travels down a pathway to the cell nucleus

Monoclonal Antibodies

- Antibodies cloned from a single antibody
- Recognize and bind to only one tumor associated antigen
- Highly specific proteins

Monoclonal Antibodies

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<tr>
<th>MOAB</th>
<th>TARGET</th>
<th>DISEASE</th>
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<tbody>
<tr>
<td>Rituximab (Rituxan®)</td>
<td>CD20</td>
<td>Non-Hodgkin’s Lymphoma</td>
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<tr>
<td>Trastuzumab (Herceptin®)</td>
<td>HER2</td>
<td>Breast</td>
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<tr>
<td>Bevacizumab (Avastin®)</td>
<td>VEGF</td>
<td>Multiple types (colorectal, NSCLC, etc)</td>
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<tr>
<td>Cetuximab (Erbitux®)</td>
<td>HER1/EGFR</td>
<td>Colorectal cancer Head &amp; neck cancer</td>
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<td>Alemtuzumab (Campath®)</td>
<td>CD52</td>
<td>Chronic lymphocytic leukemia</td>
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<td>Panitumumab (Vectibix®)</td>
<td>EGFR</td>
<td>Colorectal cancer</td>
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Courtesy of Brenda Keith, RN, MN, AOCN®
Small Molecule Inhibitors

<table>
<thead>
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<th>Name</th>
<th>Target</th>
<th>Disease</th>
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<tbody>
<tr>
<td>Lapatinib</td>
<td>Tyrosine kinase inhibitor of EGFR and HER2</td>
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<td>Nilotinib</td>
<td>BCR-ABL kinase</td>
<td>CML</td>
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<tr>
<td>Sorafenib</td>
<td>Multikinase inhibitor</td>
<td>HCC, RCC</td>
</tr>
<tr>
<td>Sunitinib</td>
<td>Multikinase inhibitor</td>
<td>GIST, RCC</td>
</tr>
</tbody>
</table>

Antiangiogenesis Agents

- **Action:** Target the neovasculature of tumors to halt their growth, prevent tumor invasion, and preclude metastatic spread.

- **Examples:**
  - Bevacizumab *(Avastin®)*
  - Thalidomide *(Thalomid®)*
  - Lenalidomide *(Revlimid®)*

Biotherapy Summary

- **Agents**
  - Derived from biologic sources or
  - That affect biologic responses

- **Mechanisms of action**
  - Vary depending on classification of agents
  - Directed towards identifiable molecular targets on tumor cells

Complementary and Alternative Therapies in Cancer Care

Complementary and Alternative Medicine (CAM)

**Complementary Methods**
- Supportive methods used in addition to (complementary to) conventional treatments (such as radiation, chemotherapy, & surgery)

**Alternative Therapies**
- Used in place of conventional medicine

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**Integrative Oncology**

- A practice where health care practitioners and patient work together to combine conventional medical treatments and CAM modalities
- Provides a collaborative holistic approach to health care
  - Considers body, mind, soul, and spirit

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**Prevalence CAM Use in US**

**General Population**
- 62% adults have used some form of CAM therapy during the previous 12 months
- Spans all ethnic backgrounds
- Greatest use if hospitalized in last year, former smoker, female, higher education levels

**Oncology Populations**
- 25-80% adults (studies since 2000)
- 40-70% are not reporting use of CAM to their health care practitioners

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**Major Types of CAM**

- Alternative medicine systems
- Energy therapies
  - Including biofield and electro-magnetic-based therapies
- Exercise therapies
  - Formerly movement therapies
- Manipulative and body-based methods
- Mind-body interventions
- Nutritional therapies
- Pharmacologic and biologic treatments
  - Including subcategories of complex natural products
- Spiritual therapies
**Oncology Nursing Responsibilities**

- Evaluate personal & professional beliefs re: use of complementary & alternative therapies
  - Recognize how own values can affect patient care
  - Establish a collaborative relationship with patients
- Assess patients for use of CAM with each contact
  - Side effects or changes in patients condition at each appointment
- Assist with locating reliable, evidence-based information and resources

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**Oncology Nursing Responsibilities**

- Understand and appropriately utilize terms (complementary, alternative, integrative therapies)
- Promote integrated education with other health disciplines
- Awareness of therapies that potentially can interfere with the outcome of other cancer treatments

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**Questions for Patients to Ask**

- Does the provider believe in this treatment because he/she has seen benefits with similar patients?
  - If so, would it be possible to speak to some of these patients?
- How will you know that the therapy is working or not working?
- Are there potential side effects?
- Is the provider willing to communicate with the patient’s primary care physician?

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**Questions for Patients**

- Can this treatment:
  - Support the immune system or other systems?
  - Counteract the cancer?
  - Enable the conventional treatment to work better?
  - Relieve symptoms or side effects?
- Have results of this treatment been published in any recognized medical journals?
- Can the provider give you any references published by others?

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Adapted from American Cancer Society and Eisenberg, D. Recommendations to MD's on Counseling Patients' Use of Alternative Medicine, Annals of Internal Medicine, 127(1): 61-69.
Resources

- American Cancer Society/Complementary and Alternative Therapies
  - www.cancer.org/Treatment/TreatmentsandSideEffects/ComplementaryandAlternativeMedicine
- Society of Integrative Oncology
  - www.integrativeonc.org
- National Center for Complementary and Alternative Medicine (NCCAM)

Resources

- Medline Plus: Cancer Alternative Therapies
- MD Anderson Cancer Center: Complementary/Integrative Medicine
  - www.mdanderson.org/education-and-research/resources-for-professionals/clinical-tools-and-resources/cimer/index.html
- Memorial Sloan Kettering Cancer Information About Herbs, Botanicals, & other Products