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Name of the subject: Advance Nursing Practice.
Name of the topic: Aberrant cell growth.
Unit:
Date: 5-2-2011.
Time: 10.15 am to 1.15 pm.
Duration: 3 hrs.
Group: M.Sc (Nursing) Ist years.
Venue: Ist year M.Sc (Nsg) class room.
Method of teaching: Lecture cum discussion.
A.V aids: Charts, Flash cards, Model, Power point, Transparencies.
Supervised by: Professor, Mrs. C.R. Shamshad Begum Madam.
Guided by: Professor, Mrs C.R. Shamshad Begum Madam.
Name of the student: Mrs. P. Anitha Grace,
M.Sc (Nsg) Ist year student

Zist of Seminar on Aberrant cell growth

- 1) Introduction
- 2) Definition of Aberrant cell growth
- 3) Incidence of Aberrant cell growth
- 4) Normal anatomy of cell and cell division.
- 5) Abnormal cell division.

- 6) Difference between Benign and Malignant tumors.
- 7) Epidemiology of Aberrant cell growth.
- 8) Carcinogenesis
- 9) Warning signals.
- 10) Metastasis, staging and grading of tumors.
- 11) Diagnostic investigations.
- 12) Treatment: - Chemotherapy
 - Surgery
 - Radiation
 - Bone Marrow transplantation
 - Photodynamic therapy.
 - Complementary and alternative therapies.
- 13) Complications.
- 14) Nursing care.
- 15) Rehabilitation.
- 16) Prevention, early detection, screening, Dietary prevention.
- 17) Research.
- 18) Summary and conclusion. —

SEMINAR ON ABERRANT CELL GROWTH

OBJECTIVES:

By the end of the seminar I will be able to

- 1) Develop skills in introducing topic from general to specific.
- 2) Develop skills in organizing the content
- 3) Develop skills in teaching Aberrant cell growth.
- 4) Explain the topic by appropriate teaching methods.
- 5) Select and prepare and utilize appropriate A V aids.
- 6) Develop skills in controlling the group.
- 7) Develop skills in methods of questioning the group.

GENERAL OBJECTIVES:

By the end of the seminar, class should be able to gain indepth knowledge regarding Aberrant cell growth.

SPECIFIC OBJECTIVES:

By the end of the seminar group should be able to:

- 1) Define Aberrant cell growth.
- 2) Review the incidence of Aberrant cell growth.
- 3) Review the anatomy and physiology of cell, normal cell growth and abnormal cell growth.
- 4) List out the warning signals of carcinoma.
- 5) List out the etiology and risk factors of aberrant cell growth.

- 6) Discuss the pathophysiology.
- 7) Discuss the various diagnostic procedures and nursing management for each of it.
- 8) Describe the management : various modalities of treatment, their side effects.
- 9) Explain the complications
- 10) Elaborate the nursing management according to nursing process.
- 11) Recall the rehabilitative process of Aberrant cell growth.
- 12) Discuss the recent advances in aberrant cell growth.

SEMINAR OUTLINE:

- 1) Introduction
- 2) Definitions
- 3) Incidence
- 4) Normal cell division and abnormal cell division
- 5) Difference between Benign and malignant tumors.
- 6) Epidemiology
- 7) Carcinogenesis and metastasis.
- 8) Warning signals , staging and grading of carcinomas
- 9) Common diagnostic procedures and nursing interventions.

10) Various treatment modalities and nursing management:

- Chemotherapy
- Radiation
- Surgery
- Bone marrow transplantation
- Photodynamic therapy
- Complementary therapies

11) Complications

12) Rehabilitation

13) Prevention, early detection, screening and dietary prevention.

14) Research

15) Summary

16) Conclusion.

Incidence:

It is reported that cancer is the cause for 1/10th of all deaths in developed countries it is 2nd most frequent cause of death. WHO according to 1995 report that with rigorous control measures cancer will become the leading cause of death and it is expected that there will be 300 million deaths from cancer in the coming year i.e.25 years.

It is also expected that 2/3rd deaths will occur in developing countries and estimated new cancer cases will increase from 5 – 10 million by 2015 in developing countries.

According to Institute of cancer and research 30 – 40% cancers are directly linked to dietary choices.

STAGING OF CANCER

The purpose of staging is to describe the extent of a malignant tumor in order to aid the physician in planning treatment, determining the prognosis, evaluating the results of treatment, and standardizing communication among health care providers for consulting, referral and research.

Staging should be done during the pretreatment phase of the disease and when applicable, after surgical resection. Clinical staging includes a physical examinations with careful inspection, palpation, auscultation, and percussion as applicable. Pathological assessment is based on evaluation of incisional, excisional, or aspiration biopsy specimens and may include dissection of regional lymph nodes.

TNM Staging System:

TNM staging system is based on measurement of the primary tumor, lymph node involvement, and metastatic spread. This general system was developed by the International Union against cancer and is revised by the American Joint committee on cancer. Based on this staging, the disease is categorized as follows:

T – Extent of the primary tumor; based on size, depth of penetration, and invasion of adjacent structure.

N – Presence, extent, and location of regional lymph node involvement.

M – Presence or absence of distant metastases and the degree of dissemination.

TUMOR:

T – 0: No evidence of primary tumor.

T – is: Carcinoma in situ.

T1 – T2 – T3 – T4: Progressive increase in tumor size and involvement.

TX: Tumor cannot be assessed.

NODES:

N O: Regional lymph nodes not demonstrably abnormal.

N1 N2 N3: Increasing degrees of demonstrable abnormality of regional lymph nodes.

N1a – for many primary sites.

N1b – metastasis to the node is not suspected.

N1c – metastasis to the node is suspected.

NX: Regional lymph nodes cannot be assessed clinically.

METASTASIS:

M0: No evidence of distant metastasis,

M1 M2 M3: Ascending degrees of distant metastasis, including metastasis to distant lymph nodes.

GRADING: Grading is the histologic classification of a tumor, which may be useful in determining the prognosis. Cancer usually are classified as grades 1 to 4, based on increasing anaplasia. The more poorly differentiated a tumor is, the less it resembles normal cells and the poorer the prognosis. Grading systems vary according to the site of the disease.

GRADING OF TUMOURS:

Gx: Grade cannot be assessed.

G1: well differentiated.

G2: moderately well differentiated.

G3 and G4: poorly to very poorly differentiated.

TREATMENT

Methods of treating clients with cancer are

- 1) Surgery
- 2) Radiotherapy
- 3) Chemotherapy
- 4) Bone marrow transplantation
- 5) Photodynamic therapy and
- 6) Alternative and complementary therapies.

The choice of method depends on the type of tumor, the extent of disease, and the client's morbid conditions (such as cardiac disease), performance status and wishes.

Performance status is a way of evaluating a client's overall health status and ability to tolerate treatment. In most cases, a client is treated with a combination of methods rather than a single therapy. This approach is called combined modality or multimodal therapy. Combined modality therapy is used in most cancer treatment regimens because it is more effective in destroying cancerous cells. For example, first surgically debulking (removing as much tumor as possible) an ovarian cancer increases the potential for the chemotherapy to be effective on the remaining tumor volume.

SURGERY

Surgery plays a major role in the diagnosis, staging, treatment, rehabilitation and palliation for clients with carcinoma.

DIAGNOSTIC SURGERY: The diagnosis of cancer is established by microscopic identification of malignant cells from tumor tissue. A variety of methods, most involving a surgical procedure, are used to obtain tissue for

diagnostic purposes. The various diagnostic surgical interventions are cytologic Specimen collection, Needle biopsy, Excisional biopsy and incisional biopsy.

SURGERY FOR STAGING: Staging operations, such as a laparotomy, may be performed to determine the appropriate therapy.

SURGERY FOR TREATMENT: Historically, the generally accepted concept of tumor growth was an orderly sequence of growth from the organ of origin of adjacent tissues, regional lymph nodes, and eventually distant sites in a systematic fashion. The logical surgical approach to this type of growth was the widest excision possible of the tumor, surrounding tissues and regional lymph nodes. Current concepts of tumor biology hold that tumors probably shed cells into the systemic circulation throughout their growth and therefore local therapies (Surgery and radiation) generally must be combined with systemic therapies (biotherapy and chemotherapy) to improve client survival.

When surgery is curative, the type of tumor determines the extent of the excision. For slow-growing tumors, such as squamous cell carcinoma and adenocarcinoma of the skin, a wide local excision may be sufficient. Tumors of the colon and breast that spread to the regional lymph nodes are removed with an en bloc excision of the tumor and regional lymph nodes. Large tumors, such as sarcomas, which tend to spread locally without metastasis, are removed with radical excisions, such as amputations.

SURGERY FOR RECURRENCE AND METASTASIS: Cancer that recurs locally can be resected, resulting in occasional cure, remission or both. Local recurrences of sarcomas as well as colon, breast, and skin cancers have been successfully excised.

Excision of metastatic lesions is considered if no other evidence of disease exists and the metastatic lesion as appeared after a relatively long disease free interval.

The metastatic lesion must exhibit some stability and must be refractory (unresponsive) to chemotherapy and radiotherapy.

Examples: Metastatic renal cell carcinomas, sarcomas, melanomas and colon carcinomas.

PALLIATIVE SURGERY: Palliative surgery that can benefit the client with cancer and improve quality of life include procedures that

- Reduce pain by such means as interrupting nerve pathways or implanting pain-control pumps,
- Relieve airway obstructions,
- Relieve obstructions in the GI and urinary tracts,
- Relieve pressure on the brain or spinal cord,
- Prevent hemorrhage,
- Remove infected and ulcerating tumors, and
- Drain abscesses.

RECONSTRUCTIVE SURGERY: Advances in reconstructive surgery offer a different perspective on rehabilitation to the client who has experienced curative surgery. Restoration of form and function is possible to varying degrees, depending on the site and extent of surgery. Reconstructive surgery may be performed concurrently with the radical procedure, or it may be delayed. The major goal of reconstructive surgery is to improve the client's quality of life by restoring maximal function and appearance.

PREVENTIVE SURGERY: The client at unusually high risk for cancer may elect to undergo a preventive(prophylactic) surgical intervention. Certain conditions or disease increase the risk of cancer occurrence so significantly that removal of the target organ is justified to prevent cancer development. Client with multiple high-factors may consider preventive surgery. The decision to have genetic testing can have far-reaching psychological implications for the client and other family members.

Examples: Clients with ulcerative colitis have a greater risk for colon cancer. Prophylactic subtotal colectomies may be indicated for this group. The decision to have genetic testing can have far-reaching psychological implications for the client and other family members. Women with BRCA 1 and BRCA 2

mutations need to be counseled on the strengths and limitations of risk assessment in predicting their own likelihood of developing breast cancer.

RADIATION THERAPY:

Radiation therapy is the use of high-energy ionizing radiation to treat a variety of cancers. Ionizing radiation destroys a cell's ability to reproduce by damaging its DNA, delaying mitosis to repair DNA or inducing apoptosis. Rapidly dividing cells are more vulnerable to radiation than more slowly dividing cells. Normal cells have a greater ability than cancer cells to repair sublethal DNA damage from radiation. In addition to the DNA effects, a complex chain of chemical reactions occur in the extracellular fluid, resulting in the formation of free radicals. Well oxygenated tumors show a much greater response to radiation than poorly oxygenated tumors. Oxygen free radicals formed during ionizing interact readily with nearby molecules, causing cellular damage. A well vascularized tumor may therefore be more responsive to radiation therapy than the same type of tumor if it is larger and, as a result, more poorly vascularized.

Radiation therapy may be used as a primary, an adjuvant, or a palliative treatment.

PRIMARY MODALITY: When radiation therapy is used as a primary modality, it is the only treatment used and aims to achieve local cure of the cancer (eg., early stage Hodgkin's disease, skin cancer, prostate cancer, carcinoma of the cervix).

ADJUVANT TREATMENT: As an adjuvant treatment, radiation therapy can be used either preoperatively or postoperatively to aid in the destruction of cancer cells, (e.g., colorectal cancer, early breast cancer). In addition, it can be used in conjunction with chemotherapy to treat disease in sites not readily accessible to systemic chemotherapy, such as the brain. In some situations, chemotherapy is used as a radiosensitizer. It is combined with radiation therapy and is administered before the radiation therapy dose in an attempt to enhance the effects of radiation therapy. For example, a client with rectal cancer may receive

the drug 5-fluorouracil (5-FU) by continuous infusion via an ambulatory pump while receiving radiation therapy to kill residual cancer cells left behind after the surgery. Cells in the S-phase, which are relatively radioresistant, can be killed by the 5-FU.

PALLIATIVE TREATMENT MODALITY: As a palliative treatment modality, radiation therapy can be used to reduce pain caused by obstruction, pathologic fractures, spinal cord compression, and metastasis. When the cancer is widespread, radiation therapy cannot be used to treat all areas of cancer spread because too much normal tissue would be harmed. Radiation therapy may be used to destroy tumor in a localized area to relieve a distressing manifestation. A few radiation treatments can be quite effective in relieving pain from a metastatic bone lesion.

ACTION OF RADIATION THERAPY:

Radiation therapy is the use of high-energy ionizing radiation to treat a variety of cancers. Ionizing radiation destroys a cell's ability to reproduce by damaging its DNA, delaying mitosis to repair DNA or inducing apoptosis. Rapidly dividing cells are more vulnerable to radiation than more slowly dividing cells. Normal cells have a greater ability than cancer cells to repair sublethal DNA damage from radiation. Therefore the radiation oncologist may deliver a sufficient dose of radiation to kill the cancer cells while sparing normal cells from excessive cell death.

In addition to the DNA effects, a complex chain of chemical reactions occurs in the extracellular fluid, resulting in the formation of free radicals. Well oxygenated tumors show a much greater response to radiation than poorly oxygenated tumors. Oxygen free radicals formed during ionization interact readily with nearby molecules, causing cellular damage. A well vascularized tumor may therefore be more responsive to RT than the same type of tumor if it is larger and, as a result, more poorly vascularized.

TYPES OF RADIATION THERAPY:

Radiation therapy can be administered by variety of methods.

EXTERNAL – BEAM RADIATION THERAPY: This is also called teletherapy. Here the radiation is delivered from a source placed at some distance from the target site. It is administered in the radiation therapy department by high energy x-ray or gamma-ray machines. The advantage of this type is that the maximum effect of radiation occurs at tumor depth in the body and not on the skin surface. Examples: It is used to treat many types of cancers including salivary gland tumors, sarcomas and tumors of the prostate and lung.

INTERNAL RADIATION THERAPY: Internal radiation therapy involves placement of specially prepare radioisotopes (radioactive isotopes) directly into or near the tumor itself (brachytherapy) or into the systemic circulation. The two major types of internal RT are 1) sealed-source RT, and 2) unsealed-source RT,

Sealed-source RT: Sealed-source RT is used for both intracavity and interstitial therapy. In intracavity therapy, the radioisotope, usually cesium 137 or radium 226, is put in an applicator, which is then placed in the body cavity for a carefully calculated time, generally 24 to 72 hours. Eg., Treatment of uterus and cervix. In interstitial therapy, the radioisotope of choice is placed in needs, beads, seeds, ribbons, or catheters, which are then implanted directly into the tumor. With sealed sources of internal radiation, the radioisotope is completely enclosed by nonradioactive material. Thus the radioisotope cannot circulate through the client's body, nor can it contaminate the client's urine, sweat, blood, or vomitus.

Unsealed-source RT: Unsealed sources of internal radiation are used in systemic therapy. Unsealed sources used for internal RT are colloid suspensions that come into direct contact with body tissues. The radioisotopes can be administered intravenously, orally, or by instillation directly into a body cavity. For example, iodine 131 is given orally in very low doses to Graves' disease. With unsealed sources of internal radiation, the radioisotope circulates through the

client's body. Therefore the client's urine, sweat, blood, and vomitus contain radioactive isotope.

GOALS OF RADIATION THERAPY:

The goal of RT is to destroy the cancer while keeping dosages within the normal tissue tolerance to avoid harming surrounding normal tissues. Several factors determine the treatment effects and side effects of RT:

Tumor location in relation to surrounding normal tissue affects both treatment effects and side effects. Certain normal tissues are more sensitive to radiation and may incur permanent damage as a result of radiation. The spinal cord and the GI, integumentary and myeloproliferative systems are at greatest risk of damage. Customized shielding "blocks" may be created to protect normal tissues from ionizing rays.

The size of the treatment field affects the dose of RT. If a small area is treated, the client can tolerate a higher dose of radiation than if a larger area is treated.

The client's overall health or performance status affects the ability to tolerate RT. For example, a client who already has severe chronic obstructive pulmonary disease is less able to tolerate RT to the lung.

The therapeutic ratio of the treatment effects on the tumor to the side effects on normal tissues is as important cost-benefit determinant in decision-making about RT.

The side effects a client may experience are related to the total dose of radiation. Radiation dose is prescribed in units called 'grays' (Gy). This term has replaced the unit of dose known as the rad (radiation absorbed dose): 1Gy equals 100rad. The RT dose is higher when the goal is curative eradication of the cancer than when the goal is pain control or palliation. The area in the treatment field is affected by the radiation. For example, hair loss occurs only in the area being treated with radiation. Therefore a client receiving RT to the chest experiences hair loss on the chest but usually not on the scalp.

Administering the radiation in divided (fractionated) rather than single doses minimizes the side effects by allowing the normal cells time to recover. Fractionation refers to dividing the total radiation dose into small, frequent doses. A common dosage schedule for external RT is 150 to 200 cGy, 5 days per week, for a total of 4 to 5 weeks. Fractionation also increases the probability that tumor cells will be in a vulnerable phase of all cell cycle when treated; cells are more sensitive to RT during the late G2 and early M phases.

SIDE EFFECTS OF RADIATION:

Radiation effects may be categorized as acute (during treatment to 6 month), subacute (after 6 months), and chronic (with variable time of expression). Early side effects are believed to be reparable, whereas late effects are more often permanent. Skin reactions and fatigue may occur with RT to any site, whereas other side effects occur only when specific areas are involved in the treatment field. It varies from mild erythema to moist desquamation similar in appearance to a second-degree burns. Site- specific manifestations of RT include mucositis, xerostomia (dry mouth), radiation caries, esophagitis, dysphagia , nausea and vomiting, diarrhea, tenesmus, cystitis, urethritis, alopecia and bone marrow suppression. These may be the result of acute changes associated with inflammation or chronic changes associated with fibrosis. The degree of myelosuppression varies with the amount of bone marrow within the treatment fields. In women of childbearing age, RT may cause prolonged or permanent infertility.

Fatigue increase during the course of treatment. The patient should be encouraged to chart a pattern of fatigue and to plan activities accordingly, with rest planned before activities.

Transient erythema, a dry desquamation with peeling of the skin may occur. The cells may become darker before they peel off. Patients complain of dryness and itching. Areas of wet desquamation occur in areas subjected o higher doses or pressure (e.g., skin folds, perineum, axils, collar area, and areas under the breast)

which creates small but painful oozing areas. Permanent skin changes may result from dermal fibrosis atrophy. The skin may feel hard, look shiny, and become darker than surrounding tissue. Telangiectasia (a dilation of capillaries related to late vascular effects and increased pressure of blood flowing through superficial vessels) results in spidery purple red vessels visible in the treated area.

Acute pulmonary effects of chest radiation therapy are increased cough which is productive. When the mucosa dries during treatment, the cough becomes nonproductive. Dyspnea, which is difficult to manage and heightens the patient's anxiety. Pneumonitis, with dyspnea, cough, fever, and night sweats appearing within 3 to 6 weeks after radiation therapy is begun. The late effects are fibrosis which may cause infection, fever, chills, dysnea, clubbing and abscesses. Gastrointestinal effects such as irradiation of the small and large intestine causes vomiting, anorexia, diarrhea, and gastric distention. Gastric emptying is delayed, returning to normal 1 to 2 weeks after treatment ends.

The toxic effects of radiation therapy depends on the

- Site of irradiation,
- The volume of tissue irradiated,
- The total dosage delivered, and
- The time frame within which it is administered.

NURSING CARE OF THE CANCER PATIENTS ON RADIATION THERAPY:

NURSING PROCESS

ASSESSMENT (SIGNS AND SYMPTOMS)

- 1) Gastrointestinal tract: Nausea and vomiting, anorexia, taste changes, esophagitis, sore throat, xerostomia, mucositis, tooth decay, diarrhea, perianal irritation.
- 2) Genitourinary: Bladder irritation, vaginal discharge, amenorrhea, impotence, sterility
- 3) Dermatologic: Hair loss, dry desquamation, moist desquamation

- 4) Central nervous system: Headache, irritability, confusion, restlessness
- 5) Neuromuscular system: Fatigue, transient myelitis
- 6) Cardiopulmonary: Pneumonitis, pericarditis, myocarditis
- 7) Hematologic: Leukopenia, thrombocytopenia

DIAGNOSIS AND INTERVENTIONS

1) Fluid volume deficit related to nausea and vomiting

NURSING INTERVENTIONS

- Administer antiemetic as needed before treatment of areas known to cause nausea and vomiting.
- Plan rest period before and after meals.
- Provide small, bland feedings and increased fluids.
- Offer frequent mouth care.
- Provide clean environment with fresh air and no odors.
- Administer intravenous therapy as ordered.
- Monitor intake and output, daily weight, and electrolytes.

2) Altered nutrition: less than body requirement related to gastrointestinal irritation and increased body requirements

NURSING INTERVENTIONS

- Encourage patient to eat high-calorie, high-protein diet.
- offer small, frequent feedings.
- Do not rush meals.
- Keep room free of odors and clutter.
- Provide meticulous mouth care.
- Use enteral feeding tube or total parenteral nutrition if necessary.
- Monitor weight daily.
- Encourage clean liquids, low-residus diet, and antacids.

3) Diarrhea related to gastrointestinal irritation

NURSING INTERVENTIONS

- Offer antidiarrheal agent per physician's order.
- Maintain good perineal care.
- Test stools for occult blood.
- Record number and consistency of stools.
- Observe for dehydration and electrolyte imbalances.

4) Altered oral mucous membranes related to treatment – induced irritation

NURSING INTERVENTIONS

- Encourage good oral hygiene with use of dental floss or water pick unless thrombocytopenia is present.
- Discourage foods that are spicy, hot, dry, or thick.
- Offer topical relief of pain-viscous lidocaine.
- Apply water-soluble lubricant (K-Y Jelly) to lips.
- Offer sugar-free popsicles.
- Offer artificial saliva.
- Encourage increased fluid intake with meals.
- Use mouth irrigations (e.g., salt and bicarbonate with water).
- Encourage use of sugarless lemon drops or mints.
- Discourage smoking, alcohol, or ginger ale.
- Assess mouth for dryness, lesions, bleeding, discharge, and tooth decay.
- Consult dentist before treatment for dental problems, including fluoride therapy.

5) Altered patterns of urinary elimination related to bladder irritation.

NURSING INTERVENTIONS

- Force fluids.
- Encourage patient to empty bladder completely.
- Administer urinary antiseptics as prescribed.

- Observe for signs of infection (e.g., burning, cloudy urine, hematuria, and fever).

6) Sexual dysfunction related to treatment-induced changes in hormonal status

NURSING INTERVENIONS

- For sterility: Help patient explore alternatives (e. g., sperm banking) if an option and hormonal therapy.
- Refer patient to sexual counselor as necessary.
- For vaginal discharge: Encourage patient douche as needed and to perform thorough perineal care.
- Observe for redness, tenderness, discharge, or drainage.
- For vaginal dryness: Observe for skin integrity and lubricants of mucosa; offer lubricants and vaginal dilator.

7) Impaired skin integrity related to treatment-induced changes

NURSING INTERVENIONS

- For alopecia: Help patient plan for wig with soft underside to minimize skin irritation; use only for special occasions.
- Have patient wear scarf or turban.
- Have patient gently wash and comb hair.
- Tell patient that hair loss secondary to whole brain radiation for primary brain tumors is permanent.
- For dermatitis: Observe irradiated area daily.
- Apply baby oil or ointment as prescribed: lanolin or Aquaphor.
- Keep reddened area dry and aerated.
- Use cornstarch, A & D ointment, hydrocortisone ointment, aloe vera.
- For moist desquamation: Provide saline soaks, moisture-permeable dressings, topical vitamins, steroids, or antibiotic ointment; expose area to air.
- Do not use adhesive tape.

- Help patient avoid excessive heat, sun light, soap, and tight, restrictive clothing.
- Provide special skin care to tissue folds (e.g., buttocks, perineum, groin, and axilla).
- Do not apply deodorant or aftershave lotion to treated area.

8) Pain (headache) related to increased intracranial pressure

NURSING INTERVENIONS

- Assess presence and characteristics of headache.
- Administer medication (e.g., steroids, analgesics) as prescribed.
- Offer patient other pain relief measures if desired.
 - Monitor pupillary response and changes in vital signs, irritability, confusion, and restlessness.

9) Impaired physical mobility related to fatigue and myelitis

NURSING INTERVENIONS

- Plan frequent rest periods.
- Assist patient with ambulation and remove environmental barriers.
- Assess reflexes, tactile sensation, and movement in extremities; report abnormal findings.
 - Observe for Lhermitte 's sign (sensation of electric shock running down back and over extremities).

10) Altered cardiopulmonary tissue perfusion related to pneumonitis, pericarditis, myocarditis, anemia, and bleeding

NURSING INTERVENIONS

- Auscultate lungs, and report signs of pleural rub.
- Observe for cough, dyspnea, and pain on inspiration.
- Treat with antibiotics and steroids as prescribed.

- Auscultator heart, and report signs of friction rub, dysrhythmia, or hypertension.
- Observe for chest pain and weakness.
- Monitor ECG report.
- Administer drugs as prescribed.
- Encourage adequate rest; alternate rest and activity periods.
- Observe patient for dyspnea and increased weakness.
- Administer oxygen therapy as needed.
- Monitor hemoglobin and hematocrit.
- Administer transfusions as ordered.

CHEMOTHERAPY:

As with surgery and RT, the goal of chemotherapy can be cure, control, or palliation of manifestations. Chemotherapy is a systemic intervention and is appropriate when the following occur:

- Disease is widespread
- The risk of undetectable disease is high
- The tumor cannot be resected and is resistant to RT.

The client who is at high risk for recurrence but shows no evidence of current disease may be a candidate for **adjuvant chemotherapy**; in this type of therapy, after initial treatment with either surgery or RT, chemotherapeutic drugs are used to eliminate any remaining submicroscopic cancer cells that are suspected to be still present. E.g., breast cancer.

Neoadjuvant chemotherapy refers to the preoperative use of chemotherapy to reduce the bulk and lower the stage of a tumor, making it amenable to surgery or possibly even cure with subsequent local therapy.

The objective of chemotherapy is to destroy malignant tumor cells without excessive destruction of normal cells.

Action of chemotherapy:

Cancer cells reproduce in the same manner as the normal cells; however, growth occurs in an uncontrollable manner and may not enter the resting phase. And the cells that are actively dividing are the most sensitive to chemotherapy. Chemotherapy directly or indirectly disrupts reproduction of cells by altering essential biochemical processes. According to the cell kill hypothesis, only a percentage of cancer cells are killed with each course of chemotherapy. Repeated doses-or cycles-of chemotherapy must therefore be used.

The use of drugs in combination, known as combination chemotherapy, has consistently been far superior to single-agent therapy. When combined, chemotherapeutic agents destroy more malignant cells and produce fewer side effects because each drug strikes the cancer cells at a different point in the cell cycle. Combination chemotherapy is now the standard in most situations. The regimens are complex, cyclic, and individualized for the client and the type of cancer.

Classification of chemotherapeutic Agents:

A classification of common chemotherapeutic agents are of two types:

- Cell cycle specific groups.
- Cell cycle nonspecific groups.

Cell cycle specific groups are:

- Anti metabolites
- Vince Alkaloids
- Epipodophyllotoxins
- Taxanes
- Camptothecins
- Miscellaneous

Cell cycle nonspecific groups are:

- Alkylating Agents
- Antitumor Antibiotics
- Hormonal Therapy: - Glucocorticoids
 - Estrogens
 - Aromatize Inhibitor
 - Anti-Estrogens
 - Progestin's
 - LHRH Analogs -Nitrosureas

ROUTES OF ADMINISTRATION:

The various routes of administration of chemotherapy are IV, regional, oral, subcutaneous, and intramuscular.

INTERVENOUS CHEMOTHERAPY: Most chemotherapy agents are administered intravenously. Extravasation (escape from the vein) of some chemotherapeutic agents can cause significant harm to the surrounding tissue. Therefore you must always know before administering a drug whether it is a vesicant (an agent capable of causing tissue damage).

Great care should be taken in vein selection and venipuncture technique. Avoid areas of impaired lymphatic drainage. Also avoid veins that are on the dorsal aspect of the hand or over an area of flexion, such as the wrist or elbow.

The most commonly reported complications are infection and catheter occlusion. For prevention of infection 1) daily assessment for manifestations of infection, and client education should be done. 2) Proper flushing , 3) vigilance for drug incompatibilities, 4) adherence to proper drug dilutions.

REGIONAL CHEMOTHERAPY: Regional chemotherapy via alternative routes allows high concentrations of drugs to be directed to localized tumors. Methods are (1) topical , (2) intra-arterial, (3) intracavitary, (4) intraperitoneal, and (4) intrathecal.

(1) **TOPICAL:** Fluorouracil cream can be applied to the skin to treat actinic keratoses (sun keratoses). Squamous cell carcinoma can arise from these precancerous lesions if they are left untreated.

(2) **INTRA-ARTERIAL:** Intra arterial infusions involve some risk but enable major organs or tumor sites to receive maximal exposure with limited serum levels of medications. As a result, systemic side effects are lessened.

(3) **INTRA-CAVITARY:** Intracavitary therapy instill the medication directly into an area such as the abdomen, bladder, or pleural space.

(4) **INTRA-PERITONEAL:** Intra peritoneal chemotherapy is an option for cancer involving the intra abdominal area, such as ovarian cancer.

(5) **INTRA-THECAL:** Most medications given systemically are not effective against CNS tumors because they cannot cross the blood brain barrier. So the physician may instill chemotherapeutic agents into the CNS through an implanted reservoir placed in the ventricle or via a lumbar puncture.

SIDE EFFECTS OF CHEMOTHERAPY:

1. Hypersensitivity reaction: Hypersensitivity reaction to chemotherapy, although uncommon, can be serious and life threatening. When administering a drug with anaphylactic potential, take the following precautions to ensure client safety.

- ❖ Obtain an allergy history from the client.
- ❖ Administer a test dose if ordered by the physician.
- ❖ Stay with the client the entire time the drug is being administered.
- ❖ Have emergency equipment and drugs readily available.
- ❖ Obtain baseline vital signs.
- ❖ Establish a free flowing IV line for the administration of fluids and emergency drugs in case they are needed.

THE MANIFESTATIONS of an immediate hypersensitivity reactions are:

-
- Dysnea
- Chest tightness or pain

- Pruritus
- Urticaria
- Tachycardia
- Dizziness
- Agitation
- Inability to speak
- Abdominal pain
- Nausea
- Hypotension
- Cloudy mental status
- Flushed appearance
- Cyanosis.

If an anaphylactic reaction is suspected take the following actions:

- Immediately stop drug administration.
- Maintain IV access with 0.9% saline
- Maintain the airway.
- Place the client in a supine position with the feet elevated, unless contraindicated.
- Notify the physician.
- Monitor the client's vital signs every 2 minutes until he or she is stable.
- Administer epinephrine, aminophylline, diphenhydramine, and corticosteroids according to the physician's orders.

2. EXTRAVASATION: Careful assessment of the IV site is required during and after the infusion of antineoplastic agents because some agents cause tissue damage if extravasated.

Vesicant chemotherapy agents can cause or form a blister and cause tissue destruction. Because they are commonly mixed in large volumes of fluid, the extravasation can be detected more easily before serious tissue damage

occurs. Irritant drugs can produce venous pain at the site and along the vein, with or without an inflammatory reaction. Pain and erythema, swelling and lack of a blood return indicate an extravasation.

The following are general recommendations for extravasation.

- Stop drug administration.
- Leave the needle in place, and attempt to aspirate any residual drug from the tubing, needle, and site.
- Administer an antidote, if appropriate, then remove the needle.
- Do not apply direct manual pressure to the site.
- Apply warm or cold compresses as indicated.
- Observe the site regularly for pain, erythema, swelling, induration, and necrosis.
- Document the appearance of the site before and after chemotherapy.

SAFE PREPARATION, HANDLING, AND DISPOSAL:

The safe administration and disposal of chemotherapeutic agents decrease the risk of undue exposure for the health care provider. The potential risks include genotoxicity, carcinogenicity, and serious organ damage. Undue exposure to antineoplastic drugs can occur from three major routes.

- Inhalation of aerosols
- Absorption through the skin
- Ingestion of contaminated materials.

The guidelines call for (1) the wearing of gloves and gowns during preparation and administration and (2) the use of a biological safety or laminar flow cabinet for preparation. Antineoplastic agents and their metabolites are found in the excreta and body fluids of clients undergoing chemotherapy. For this reason, you should wear gloves and disposable gowns when handling body secretions, such as blood, vomitus, or excreta, of clients who have received chemotherapy within the previous 48 hours.

NURSING PROCESS FOR SIDE EFFECTS OF CHEMOTHERAPY

ASSESSMENT (SIGNS & SYMPTOMS)

- 1) Gastrointestinal: Nausea and vomiting, diarrhea, constipation, stomatitis, esophagitis, anorexia.
- 2) Dermatologic: Alopecia, dermatitis, changes in skin color, hyperpigmentation of nail beds, rash, jaundice, pruritus, extravasation
- 3) Hematologic: Fatigue and dyspnea (anemia), petechiae, ecchymoses, frank bleeding (thrombocytopenia), fever, chills, hypotension (leucopenia)
- 4) Reproductive: Senility, amenorrhea, decreased libido
- 5) Urinary: Hemorrhagic cystitis, as evidenced by hematuria, burning during urination, and backache; nephrotoxicity, as evidenced by muscular weakness, parenthesis, absence of deep tendon reflexes
- 6) Neurologic: Ototoxicity, as evidenced by vertigo, tinnitus, and loss of hearing; peripheral neuropathies as evidenced by muscular weakness, parenthesis, absence of deep tendon reflexes
- 7) Musculoskeletal: Myalgia, muscle weakness, osteoporosis, gout
- 8) Respiratory: Pulmonary fibrosis, as evidenced by dyspnea, chest pain, or cyanosis

DIAGNOSIS AND IMPLEMENTATION:

- 1) **Fluid volume deficit related to nausea and vomiting**

NURSING INTERVENTION

- Administer antiemetic (prochlorperazine, thiethylperazine, triethylperazamide, metoclopramide, intravenous dexamethasone, or tetrahydrocannabinol [THC]) prophylactically before chemotherapy and on regular schedule after therapy per physician order.
- Withhold food and fluids for 4 to 6 hours before treatment.

- Provide small feedings and increase fluids.
- Provide frequent mouth care.
- Provide clean environment with fresh air and no odors.
- Monitor intake and output, weight, and electrolytes.
- Administer intravenous therapy as ordered.
- Use relaxation techniques, guided imagery, self-hypnosis, and distraction as indicated.

2) Constipation related to impaired intestinal motility

NURSING INTERVENTIONS

- Offers fluids and foods high in fiber and bulk; offer stool softeners or laxatives.
- Avoid enemas.
- Use warmth, such as a heating pad.

3) Diarrhea related to intestinal irritation

- Offer clear liquids.
- Offer antidiarrheal agent, such as kapectate or diphenoxylate (Lomita), per physician`s order.
- Maintain good perinea care.
- Test stools for occult blood.
- Record number and consistency of stools.
- Observe for dehydration and electrolyte imbalance.

4) Altered oral mucous membranes related to poor oral hygiene, preexisting dentinal disorders, or drug-induced irritation.

NURSING INTERVENTION:

- Avoid alcohol an tobacco.
- Encourage good oral hygiene.

- Discourage spicy and hot foods.

- Offer topical agents for relief of pain (lidocaine or cyclonite) per physician's order.

- Apply water-soluble lubricant (K-Y Jelly) to lips.

- Offer popsicles.

- Use oral assessment guide to monitor changes in voice and ability to swallow, As Well as condition of lips, tongue, mucous membranes, gingival, teeth, and saliva.

- Avoid foods that are difficult to chew, such as apples, and highly acidic beverages such as citrus juices.

- Have patient postpone dental work if possible; have patient brush teeth gently and use toothettes.

5) Altered nutrition: less than body requirements related to gastrointestinal irritation and increased body requirements

NURSING INTERVENTION

- Offer bland or pureed foods.
- Have patient avoid spicy foods, alcohol, and tobacco.
- Offer antacids.
- Identify food preference.
- Offer small, frequent feedings.
- Do not rush meals.
- Keep room free of odors and clutter.
- Provide meticulous mouth care.
- Use enteral feeding tube or total parenteral nutrition if necessary.
- Weight daily.

6) Impaired skin integrity related to drug induced changes, extravasation

NURSING INTERVENTION

- For alopecia: Help patient plan for wig, scarf, or hat before hair loss.
- Offer tourniquet or ice cap preventive therapy based on policy and diagnosis.
- Have patient wash and comb remaining hair gently.
- Reassure patient that hair will grow back after therapy.
- For dermatitis: Use cornstarch, Alpha, Keri, calamine lotion, or other agent.
- Warn against overexposure to sun.
- Keep skin clean and dry.
- For changes in color or skin or nail beds: Assure patient that discoloration will fade with time.
- Use nail polish according to patient's wishes.
- For jaundice: Monitor hepatic enzymes.
- Assess skin and sclera daily.
- For extravasations: Observe for early signs, which include pain or burning sensation at or above IV site, blanching, redness, swelling, slowing of infusion, absence of blood return.
- Stop infusion; aspirate remaining drug from needle, inject antidote, and apply topical ointment, heat, or cold as dictated by protocol.

7) Impaired gas exchange related to anemia, pulmonary, fibrosis, cardiotoxicity

NURSING INTERVENTIONS

- Monitor respiratory function with pulmonary function tests.
- Note limitation of lifetime dosage of bleomycin.
- Help with pulmonary function studies.
- Provide oxygen therapy, sedative, cough suppressants, and steroids as prescribed.
- Have patient change position slowly, and encourage adequate rest.
- Observe patient for dyspnea and increased weakness.
- Monitor hemoglobin and hematocrit.

- Administer transfusions as ordered.
- Monitor heart rate, blood pressure, and ECG.

8) Altered peripheral tissue perfusion related to bleeding.

NURSING INTERVENTION

- Protect patient from injury (e.g., use precautions when shaving with razor blade, do not permit cluttered environment, and do not administer rectal suppositories).
- Have patient avoid using aspirin and aspirin products.
- Avoid giving injections; if they are necessary, apply pressure at site for 3 to 5 minutes afterward.
- Use toothettes for oral care.
- Monitor skin (petechiae, ecchymosed), urine, and platelet count.
- Evaluate neurologic status.
- Have nasal packing available.
- Administer platelet transfusions as necessary.
- Monitor vital signs.
- Support patient in ambulation.

9) Potential for infection related to leucopenia, bone marrow suppression.

NURSING INTERVENTION

- Warn patient to avoid crowds and people with colds, flu, or cold sores.
- Use sterile technique whenever needed.
- Initiate reverse isolation as indicated.
- Monitor temperature and leukocyte count; observe skin temperature, color, and odor.
- Encourage careful hygiene.
- Discourage fresh-cut flowers.
- Avoid using indwelling catheters or performing rectal procedures or examinations.
- Administer antibiotics as prescribed.
- Provide analgesics as ordered.

- Encourage fluids.

10) Sexual dysfunction related to drug-induced changes in hormonal status

NURSING INTERVENTIONS:

- Help patient explore alternatives for sterility (e.g., sperm banking, hormonal therapy during treatment, and postponement of conception and childbearing). Refer to sexual counselor as needed.

11) Altered patterns of urinary elimination related o drug induced neurotoxicity

NURSING INTERVENATIONS

- Force fluids.
- Monitor blood urea nitrogen, serum create-nine, creatinine clearance, and electrolytes.
- Administer diuretics as ordered.
- Encourage foods high in potassium.
- Administer normal saline an Manitou before cisplatin therapy per physician's order.
- Administer allopurinol as prescribed with high fluid intake.
- Encourage patient to empty bladder frequently, especially at night.
- Provide adequate hydration.

12) Sensory/Perceptual alteration (auditory, tactile) related to drug-induced neurotoxicity

NURSING INTERVENTIONS

- Monitor hearing with baseline and periodic audiograms.
- Speak clearly and in normal tone of voice.
- Assess patient for numbness and tingling in extremities.
- Prohibit smoking and having patient observe placement of feel and hands.

13) Impaired physical mobility related to drug-induced gout, osteoporosis, myelotoxicity

NURSING INTERVENTIONS:

- Monitor calcium level.
- Provide safety measures.
- Be alert for complaint of pain over bony area: if patient has such a complaint, maintain bed rest until x-rays are taken for fracture.
- Use assistive devices for ambulation.
- Encourage range-of-motion exercises.
- Position patient in proper anatomic alignment.

14) Altered cardiopulmonary tissue perfusion related to pneumonitis, pericarditis, myocarditis, and bleeding

NURSING INTERESTIONS

- Auscultate lungs, and report signs of pleural rub.
- Observe for cough, dyspnea, and pain on inspiration.
- Treat with antibiotics and steroids as prescribed.
- Auscultator heart, and report signs of friction rub, dysrhythmia, or hypertension.
- Observe for chest pain and weakness.
- Monitor ECG report.
- Administer drugs as prescribed.
- Encourage adequate rest; alternate rest and activity periods.
- Observe patient for dyspnea and increased weakness.
- Administer oxygen therapy as needed.
- Monitor hemoglobin and hematocrit. Administer transfusions as ordered.

15) Ineffective individual coping related to stress of dealing with chemotherapy

NURSING INTERVENTIONS

- Assess patient's coping behavior, and determine its effectiveness.

- Reassure patient that mood changes are temporary and dose related.
- Allow independence in self-care.
- Maintain supportive, nonjudgmental attitude.
- Encourage use of resource, such as support groups.
- Encourage patient to express fears.

BONE MARROW TRANSPLANTATION:

Bone marrow transplantation (BMT) is a treatment for certain cancers that involves intravenous infusion of bone marrow into the patient to replace the defective host hematopoietic system with healthy stem cells. As these undifferentiated cells (from which all other cells lines arise) engraft, both the cellular and umoral elements of immunity are replaced. For e.g., leukemia's, non-Hodgkin's lymphoma, Burkitt's lymphoma, multiple myeloma, osteosarcoma, and breast cancer.

TYPES OF BONE MARROW TRANSPLANTATION:

There are three types of transplantations:

- Autologous
- Syngeneic
- Allogeneic.

Autologous:

Autologous transplantation involves harvesting the patient's marrow after treatment with cytoreductive therapy. The marrow may be further treated with chemotherapy to remove any remaining tumor cells and is then frozen until the patient needs it.

Syngeneic:

Syngeneic transplant involves using an identical twin as donor, which ensures that donor cells are matched with those of the recipient at all genetic loci.

Allogenic:

Allogeneic transplant usually involves a sibling as donor, but the donor may be any relative of an untreated donor with compatible human leukocyte antigens (HLA) and mixed lymphocyte culture (MLC).

PROCEDURE:

Once a compatible donor has been selected, the marrow usually is harvested from the posterior iliac crest of the donor, but it may be taken from the anterior iliac crest or the sternum. This is a relatively safe procedure that rarely causes problems for the donor. The marrow is filtered through a screen to remove fat particles and bone chips and then is placed in a heparinized saline solution. T cells or red blood cells may be removed before the marrow is infused into the recipient.

PREPARATION:

Preparation of the recipient involves either high-dose chemotherapeutic agents or high dose chemotherapy and total body irradiation (TBI). It may take as long as 10 days to prepare the patient for the transplant. Before the marrow infusion, the recipient is hydrated with a bicarbonate solution to force a brisk alkaline urine flow, which prevents the renal complication of red blood cell hemolysis. Bone marrow then is infused via a central line without a filter over a period of 1 to 4 hours.

After the bone marrow transplant, the recipient progresses through stages of severe, prolonged aplasia; lingering side effects of the preparatory therapy; and then engraftment of the donor marrow. If there are no complications, the patient remains in the hospital for 1 ½ to 2 months and is closely followed as an outpatient for at least 1 year.

COMPLICATIONS:

- Acute complications include
- Mucositis
- Viral infection
- Bacterial sepsis

- Fungal sepsis
- Renal sepsis
- Interstitial pneumonias
- Venous-occlusive disease and
- Graft versus host disease.

Late complications include:

High risk for fungal , bacterial and viral sepsis:

- Bacterial sepsis includes: gram-negative pathogens, gram-positive pathogens.
- Fungal sepsis includes: Aspergillus and candida spe.
- Viral sepsis includes: varicella zoster, herpes simplex virus and cytomegalovirus.

Other serious complication is *veno-occlusive disease*. It is caused by the accumulation of fibrous material in the small venules of the liver after high-dose chemotherapy and total body irradiation. The fibrous material eventually creates a plug and occludes hepatic and renal blood flow.

A unique complication of bone marrow transplantation is graft versus host disease (GVHD), which occurs in as much as 60% of allogeneic recipients. The new bone marrow produces immunocompetent cells, which recognize their environment as foreign and try to destroy their new host body. It usually appears within 2 weeks to 3 months after transplantation. Signs and symptoms of this complication includes erythema , a maculopapular rash, blistering and desquamation, liver failure, diarrhea, abdominal pain and denuding of the gastrointestinal tract. Chronic graft versus host disease occurs 3 months to 1 year after transplantation. It is caused by autoreactive T cells and autoantigens and is manifested as scleroderma-like changes in the skin, gastrointestinal tract, and liver; immune deficiency; marrow suppression; and changes in respiratory and musculoskeletal function. It is treated with prednisone and azathioprine.

Care: The psychosocial impact of bone marrow transplantation on patients and their families is great. The “cured” patient may be chronically ill and experiencing an altered quality of life. Fear of death and dying may yield to feelings of guilt, depression, and anxiety among survivors. Changes in life priorities and perspective may not be shared by the patient’s loved ones, leaving the patient feeling isolated. So the nurse’s responsibility is to help the patient deal with the challenges of survival in each stage of transplantation.

PHOTODYNAMIC THERAPY

Photodynamic therapy (PDT) involves injecting the patient with intravenous dihematoporphyrin ether (DHE) or some other photosensitizing agent. Waiting 48 to 72 hours for the drug to clear healthy tissues and concentrate in malignant cells, and then exposing the cancerous area to laser light delivered through a scope (e.g., cystoscope or bronchoscope). Although all cells absorb the photosensitizing agent, retention is higher in malignant tissues, the liver, spleen, kidneys, and skin. The laser emits powerful red light that penetrates tissue and activates the photosensitizer in the malignant cells. A superoxide, which is produced by the chemical reaction between the laser beam and the photosensitizer, changes the cell membrane, destroying the malignant cells. This is used as possible cure for early stages of skin and bladder cancers and for palliation of advanced lung, esophageal, and pelvic cancers.

The American Cancer Society classifies complementary and alternative therapies in five main groups

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<p>1. 'Mind-body therapies'</p>	<p>These use methods that are said to improve the ability of the mind to have a positive physical effect on your body. Examples include prayer, hypnosis, yoga, t'ai chi, meditation, and art or music therapy.</p>
<p>2. 'Herbs, vitamins and minerals'</p>	<p>These include vitamins and herbs, and food substances such as those used in homeopathy</p>
<p>3. 'Manual healing and physical touch'</p>	<p>. These are based on manipulation and movement of body parts as well as using 'energy fields'; they include massage, chiropractics, acupuncture, reiki, light therapy and osteopathy</p>
<p>4. 'Diet and nutrition' 'Pharmacological and biological treatment'</p>	<p>These include diets that involve 'detoxification', 'cleansing' with enemas, fasting, juicing and other practices. (Some of these are thought of as alternative therapies.)</p> <p>examples include shark cartilage, oxygen therapy, laetrile and radio wave cancer treatment, and questionable cancer clinics in Mexico</p>
<p>5. Many of these are thought of as alternative therapies rather than complementary therapies:</p>	

ALTERNATIVE AND COMPLEMENTARY THERAPIES IN CANCER

Many people with cancer are exploring complementary therapies. These methods focus on the mind, body, and spirit. They do not take the place of medical

therapies, but add to them. They can reduce [stress](#), lessen [side effects](#) from cancer and cancer treatments, and enhance well-being. And they can help you feel more in control. Many more therapies exist such as art therapy, humor, journaling, [reiki](#), [music therapy](#), pet therapy and others

Biofeedback

With training in [biofeedback](#), we can control body functions such as heart rate, [blood pressure](#), and muscle tension. A machine will sense when the body shows signs of tension and gives off a alarm. Eventually, one can control relaxation responses without having to depend on feedback from the machine..

Distraction

Distraction is the use of an activity to take ones mind off the worries or discomforts. Talking with friends or relatives, watching TV, listening to the radio, reading, going to the movies, or working with hands by doing needlework or puzzles, building models, or painting are all ways to distract oneself.

Hypnosis

[Hypnosis](#) puts one in a deeply-relaxed state that can help reduce discomfort and [anxiety](#). One can be hypnotized by a qualified person.

Imagery

[Imagery](#) is a way of daydreaming that uses all the senses. It is usually done with eyes closed. To begin, one should breathe slowly and feel relaxed

Massage Therapy

The idea that touch can heal is an old one. The first written records of [massage](#) date back 3,000 years ago to China. Massage therapy involves touch and different methods of stroking and kneading the muscles of the body. A licensed [massage therapist](#) should do the therapy.

Meditation and Prayer

Meditation is a relaxation technique that allows one to focus on energy and thoughts on something very specific. This is especially helpful when mind and body are stressed from cancer treatment. Another form of meditation is allowing ones thoughts, feelings, and images to flow through their mind. For patients who believe in a higher spiritual power, prayer can provide strength, comfort and inspiration throughout the cancer experience. Whether one prays alone, with family and friends, or as a member of a religious community, prayer may help. A member of the clergy or your spiritual advisor can help incorporate prayer into daily life.

Muscle Tension and Release

Lying down in a quiet room. Take a slow, deep breath. As one breathes in, tense a particular muscle or group of muscles. For example, squeeze eyes shut, frown, clench teeth, make a fist, or stiffen arms or legs. Hold breath and keep muscles tense for a second or two. Then breathe out, release the tension, and let the body relax completely. Repeat the process with another muscle or muscle group. We also can try a variation of this method, called "progressive relaxation." Start with the toes of one foot and, working upward, progressively tense and relax all the muscles of one leg. Next, by doing the same with the other leg. Then tense and relax the rest of the muscle groups in the body, including those in the scalp. Remember to hold the breath while tensing the muscles and to breathe out when releasing the tension.

Physical Exercise **Exercise** can help lessen pain, strengthen weak muscles, restore **balance**, and decrease **depression** and **fatigue**. After getting approval from the doctor, one may want to begin by walking 5-10 minutes twice a day and later increasing the activity.

Rhythmic Breathing

Getting into a comfortable position and relaxing all the muscles. while keeping the eyes open, focus on a distant object. By closing the eyes, imagine a peaceful scene or simply clear the mind and focus on the breathing.

Breathe in and out slowly and comfortably through the nose. This technique for just a few seconds or for up to 10 minutes. End rhythmic breathing by counting slowly and silently to three. **Visualization** . Visualization is similar to imagery. With visualization, one creates an inner picture that represents fight against cancer. Some people getting **chemotherapy** can use images of rockets blasting away their cancer cells or of knights in armor battling their cancer cells. Others create an image of their white blood cells or their drugs attacking the cancer cells. **Yoga** All one needs is a quiet, comfortable place and some time each day to practice breathing, stretching, and meditation

PREVENTION, SCREENING, AND EARLY DETECTION

The number of people who develop cancer is on the rise. Some of these cancers can be cured in the early stages, but not when the disease is too advanced. Early detection and treatment are the keys to curing cancer; preventing cancer in the first place is even better.

General prevention guidelines:

There are two main guidelines :

- Smoking has been scientifically proven to cause cancer, so stop smoking.
- Proper dietary recommendations should be followed.

DIETARY RECOMMENDATIONS:

The following are dietary recommendations need to be followed to prevent cancer.

- Reduce the amount of fat in your diet to 30% of your total daily calorie intake.
- Limit the amount of alcohol you drink to one or two drinks a day.
- Limit the amount of charbroiled, smoked, and salted foods you eat.
- Maintain your ideal weight.
- Eat foods high in:

Vitamin A – apricots, peaches, carrots, spinach, asparagus, and sweet potatoes.

Vitamin C – Oranges, lemons, grapefruit, strawberries, tomatoes, cabbage, and walnuts.

Vitamin E – Lettuce, alfalfa, and vegetable oils.

Fiber – fresh vegetables and fruits, whole grain breads and cereals, nuts, beans, and peas.

RECOMMENDED STEPS TO BE TAKEN TO PREVENT CANCER:

FRUITS AND JUICES:

Grapes and grape juice, especially purple and red grapes, contain resveratrol. Resveratrol has strong antioxidant and anti-inflammatory properties. In laboratory studies, it has prevented the kind of damage that can trigger the cancer process in cells. There is not enough evidence to say that eating grapes or drinking grape juice or wine can prevent or treat cancer.

Limit Alcohol to Lower Cancer Risk

Cancers of the mouth, throat, larynx, esophagus, liver, and breast are all linked with drinking alcohol. Alcohol may also raise the risk for cancer of the colon and rectum. The American Cancer Society says that even the suggested daily limit of 2 drinks for men and 1 for women elevates the risk. Women at higher risk for breast cancer may want to talk with a doctor about what amount of alcohol, if any, is safe based on their personal risk factors.

Water and Other Fluids Can Protect

Water not only quenches your thirst, but it may protect you against bladder cancer. The lower risk comes from water diluting concentrations of potential cancer-causing agents in the bladder. Also, drinking more fluids causes you to urinate more frequently. That lessens the amount of time those agents stay in contact with the bladder lining.

The Mighty Bean

Beans are so good for you, it's no surprise they may help fight cancer, too. They contain several potent phytochemicals that may protect

The Cabbage Family vs. Cancer

Cruciferous vegetables include broccoli, cauliflower, cabbage, Brussels sprouts, bok choy, and kale. These members of the cabbage family make an excellent stir fry and can really liven up a salad. But most importantly, components in these vegetables may help your body defend against cancers such as colon, breast, lung, and cervix

Dark Green Leafy Vegetables

Dark green leafy vegetables such as mustard greens, lettuce, kale, chicory, spinach, and chard have an abundance of fiber, folate, and carotenoids. These nutrients may help protect against cancer of the mouth, larynx, pancreas, lung, skin, and stomach.

Protection From an Exotic Spice

Curcumin is the main ingredient in the Indian spice turmeric and a potential cancer fighter. Lab studies show it can suppress the transformation, proliferation, and invasion of cancerous cells for a wide array of cancers

Cooking Methods Matter

How you cook meat can make a difference in how big a cancer risk it poses. Frying, grilling, and broiling meats at very high temperatures causes chemicals to form that may increase cancer risk. Other cooking methods such as stewing, braising, or steaming appear to produce fewer of those chemicals. And when you do stew the meat, remember to add plenty of healthy, protective vegetables.

A Berry Medley With a Punch

Strawberries and raspberries have a phytochemical called ellagic acid. This powerful antioxidant may actually fight cancer in several ways at once, including deactivating certain cancer causing substances and slowing the growth of cancer cells

Cancer Protection Published by world cancer research fund.

A major report published by the [World Cancer Research Fund](#) in 1997

recommended we lower our risk of cancer by choosing predominantly plant-based diets rich in a variety of vegetables and fruits, legumes and minimally processed starchy staple foods, and to limit the intake of grilled, cured and smoked meats and fish. These methods of preparing meat produce polycyclic aromatic hydrocarbons and heterocyclic amines which are carcinogenic .

Over 200 studies have revealed that a regular consumption of fruits and vegetables provides significant protection against cancer at many sites. People who consume higher amounts of fruits and vegetables have about one-half the risk of cancer, especially the epithelial cancers . The risk of most cancers was 20-50% lower in those with a high versus a low consumption of whole grains .

About three dozen plant foods have been identified as possessing cancer-protective properties. These include

- **cruciferous vegetables** (broccoli, Brussels sprouts, cabbage, cauliflower),
- **umbelliferous vegetables and herbs** (carrots, celery, cilantro, caraway, dill, [parsley](#)),
- **other fruits and vegetables** ([citrus](#), tomatoes, cucumber, grapes, cantaloupe, berries),
- **beans** ([soybeans](#)), **whole grains** (brown rice, oats, whole wheat),
- **flaxseed**, many **nuts**, and
- various **seasoning herbs** ([garlic](#), scallions, onions, chives, ginger, turmeric, [rosemary](#), [thyme](#), oregano, sage, and basil).

These foods and herbs contain a host of cancer-protective phytochemicals such as carotenoids, flavonoids, isothiocyanates, isoflavones, ellagic acid, glucarates, curcumin, lignans, phenolic acids, phthalides, saponins, phytosterols, sulfide compounds, terpenoids, and tocotrienols. These beneficial compounds alter

metabolic pathways and hormonal actions that are associated with the development of cancer, stimulate the immune system, and have antioxidant activity .

Prevention, screening, and early detection guidelines for common cancers.

BREAST CANCER:

- 1) Reduce the amount of fat in your diet.
- 2) Detect the warning signals for cancer:
 - Dimpling of the skin
 - a sinking in of the nipple,
 - discharge from the nipple,
 - swelling in the breast, or
 - a change in the size or shape of the breast.
- 3) Early detection includes:
 - ✓ -breast self-examination once a month,
 - ✓ -a yearly breast examination by a health care provider
 - ✓ -a baseline mammogram between the ages of 35 and 39
 - ✓ -a yearly mammogram after age 40.If you have a family history of breast cancer, you should start having mammograms at age 30.

CERVICAL CANCER:

- I. Avoid sex at an early age (especially before age 18)
- II. Don't have numerous partners
- III.Practice good perineal hygiene.
- IV.Detect the cancer warning signs – abnormal vaginal bleeding and spotting after having sex.
- V. Early detection involves an annual pap smear for women over age 18. After at least three normal examinations, the test can be done less often.

COLON/RECTAL CANCER:

- ✓ Follow the dietary guidelines.
- ✓ Have colorectal polyps removed.
- ✓ Cancer warning signs include rectal bleeding, a change in stools, pain in the abdomen, and pressure on the rectum.
- ✓ Early detection includes an – annual digital rectal examination starting at age 40, an annual stool blood test starting at age 50, and an annual inspection of the colon with sigmoidoscopy starting at age 50.

ENDOMETRIAL CANCER:

- Follow the dietary guidelines
- Discuss with your doctor the benefits and risks of estrogen therapy if you are past menopause.
- Cancer warning signs include:
 - Abnormal vaginal bleeding
 - Pain or a mass in the abdomen
- Early detection includes:
 - Pelvic examinations
 - Endometrial biopsy at menopause and in high-risk women.

HEAD AND NECK CANCER:

- Follow the dietary guidelines ,
- Avoid tobacco in all forms,
- Practice good oral hygiene,
- Cancer warning signs include – difficulty chewing, - persistent sore throat, - hoarseness, - a color change in the mouth, - earache, - a lump in the neck, - loss of sense of smell, - and difficulty breathing.
- Early detection includes monthly oral self-examination and an annual physical exam.

LUNG CANCER:

- ❖ Do not smoke,
- ❖ Follow guidelines at work to reduce exposure to cancer-causing substances.
- ❖ Warning signs include - a persistent cough or cold, - pain in the chest, - wheezing, - difficulty breathing, - and a change in the volume or odor of phlegm.
- ❖ No tests exist for early detection.

PROSTATE CANCER:

- There are no prevention guidelines for prostate cancer.
- Warning signs include difficulty urinating, painful and frequent urination, and blood in the urine.
- Early detection includes an annual digital rectal exam starting at age 40.

SKIN CANCER:

- ✓ Use a sunscreen with a sun protection factor (SPF) of at least 15 (the SPF is shown on the bottle)
- ✓ Wear protective clothing when in the sun.
- ✓ Avoid tanning booths.
- ✓ Cancer warning signs include - a change in a wart or mole, - and a sore that does not heal.
- ✓ Early detection includes an – annual physical examination, - monthly self-examination of the skin, - and paying particular attention to moles, warts, and birthmarks.

TESTICULAR CANCER:

- No prevention guidelines exist for testicular cancer.
- Cancer warning signs include swelling, a lump, or a heavy feeling in the testicle.
- Early detection includes an annual physical exam and monthly testicular self exam.

BREAST SELF-EXAMINATION

Performing breast self-examination once a month could save your life. Many breast cancer are discover by patients who had regularly done self-exam and thus were able to distinguish a change from what is normal in their breasts.

CERVICAL CANCER VACCINATION

Many women die with cervical cancer every year. But the good news is that this statistics may see a decrease with the introduction of HPV Vaccine (Human papilloma virus).

Research shows that 2 stains of HPV, that is 16 – 18 are responsible for 70% of cervical cancer. We now have two vaccines available which have been shown to provide immunity to these cancer-causing strains and preventing pre-cancerous damage, they are Gardasil and Cervarix.

How does the vaccine work:

The vaccines work by including antigens of the particular live attenuated virus causing strains in to the immune system. The immune system will react to these particular HPV strains. In the future, should the body be infected by one of these strains, the immune system will recognize them immediately. The body's immune system will then mount a swift response, clearing the virus, and hopefully preventing it from remaining in the body where it can damage cells, causing cervical pre cancer.

Who can have the vaccine:

As both sex transmit the virus, both can be vaccinated, but we the females are vaccinated, then there should be no real need to vaccinate males.

How long will the vaccine give protection:

Current published research shows that protection against HPV infection and cervical pre cancerous change lasts at least 5 years about booster vaccination it is still to be determined.

National Cancer Control Programme (NCCP)

India

Cancer has become one of the ten leading causes of death in India. It is estimated that there are nearly 1.5–2 million cancer cases at any given point of time. Over 7 lakh new cases of cancer and 3 lakh deaths occur annually due to cancer. Nearly 15 lakh patients require facilities for diagnosis, treatment and follow up at a given time. Data from population-based registries under National Cancer Registry Programme indicate that the leading sites of cancer are oral cavity, lungs, oesophagus and stomach amongst men and cervix, breast and oral cavity amongst women. Cancers namely those of oral and lungs in males, and cervix and breast in females account for over 50% of all cancer deaths in India.

WHO has estimated that 91 per cent of oral cancers in South–East Asia are directly attributable to the use of tobacco and this is the leading cause of oral cavity and lung cancer in India.

Cancer usually occurs in the later years of life and with increase in life expectancy to more than 60 years, an estimate shows that the total cancer burden in India for all sites will increase from 7 lakh new cases per year to 14 lakh by 2026. National Cancer Control Programme was started in 1975–76.

Global

Cancers in all forms are causing about 12 per cent of deaths throughout the world. In the developed countries cancer is the second leading cause of death accounting for 21% (2.5 million) of all mortality. In the developing countries cancer ranks third as a cause of death and accounts for 9.5% (3.8 million) of all deaths. Tobacco alcohol, infections and hormones contribute towards occurrence of common cancers all over the world.

Goals & Objectives

1. Primary prevention of cancers by health education regarding hazards of tobacco consumption and necessity of genital hygiene for prevention of cervical cancer.
2. Secondary prevention i.e. early detection and diagnosis of cancers, for example, cancer of cervix, breast cancer and of the oro-pharyngeal cancer by screening methods and patients' education on self examination methods.
 3. Strengthening of existing cancer treatment facilities, which were inadequate.
4. Palliative care in terminal stage cancer.

Existing Schemes under NCCP

Financial Assistance to Voluntary Organisations

This scheme is meant for IEC activities and early detection of cancer. Under the scheme financial assistance up to Rs.5.00 lakh is provided to the registered voluntary organisations recommended by the State government for undertaking health education and early detection activities in cancer. A linkage with the Regional Cancer Centre (or Medical College/Distt. Hospital if there is no RCC) is now mandatory by the NGO concerned.

District Cancer Control Scheme

It is known that a large number of cancer cases can be prevented with suitable health education and early case detection. Accordingly the scheme for district projects regarding prevention, health education, early detection and pain relief measures were started in 1990-91. Under this scheme one time financial assistance of Rs.15.00 lakh is provided to the concerned State Government for each district project selected under the scheme with a provision of Rs.10.00 lakh every year for the remaining four years of the project period. The project is linked with a Regional Cancer Centre or an institution having good facilities for treatment of cancer patients. The patients are provided treatment at the concerned Regional Cancer Centre or the nodal institution.

Cobalt Therapy Installation

To strengthen the cancer treatment facilities, the financial assistance of Rs. 1.0 crore for charitable organisations and 1.5 crore for government institutions is provided for procurement of teletherapy and brachytherapy equipments etc. This is one time grant as at present.

Development of Oncology Wings in Govt. Medical College Hospitals

This scheme had been initiated to fill up the geographical gaps in the availability of cancer treatment facilities in the country. Central assistance is provided for purchase of equipments, which include a teletherapy unit beside other equipments. The civil works and manpower are to be provided by the concerned State Government/Institution. The quantum of central assistance is Rs.2.00 crore per institution under the scheme. The scheme provides one time grant only.

Regional Cancer Centres

There are 19 Regional Cancer Research and Treatment Centres recognised by Government of India and recurring grant of Rs.75 lakhs is being given to these Regional Cancer Centres.

COMPARISION OF THE CHARATERISTICS OF BENIGN AND MALIGNANT NEOPLAMS:

Characteristic	Benign Neoplasm	Malignant Neoplasm
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Speed of growth.	:Grows slowly . -:Usually continues to grow throughout life unless surgically removed -:May have periods of remission	Usually grows rapidly. :Tends to grow relentlessly throughout life. - -:Rarely, neoplasm may regress spontaneously
Mode of spread.	:Grows by enlarging and expanding :Always remains localized; never infiltrates surrounding tissues.	:Grows by infiltrating surrounding tissues. :May remain localized (in situ), but usually infiltrates other tissues.
Capsule	Almost always contained within a fibrous capsule. Capsule does not prevent expansion of neoplasm but does prevent growth by infiltration. Capsule advantageous because encapsulated tumor can be removed surgically.	:Never contained within a capsule. :Absence of capsule allows neoplastic cells to invade surrounding tissues. :Surgical removal of tumor is difficult
Cell characteristics.	Usually well differentiated. :Mitotic figures absent or scanty. :Mature cells. Anaplastic cells absent. :Cells function poorly in comparison with normal cells from which they arise. :If neoplasm arises in glandular tissue, cells may secrete hormones.	Usually poorly differentiated. :Large numbers of normal and abnormal mitotic figures present. :Cells tend to be anaplastic.(i.e., young, embryonic type).

<p>Recurrence</p> <p>Metastasis</p> <p>Effect of neoplasm</p> <p>Prognosis.</p>	<p>Recurrence extremely unusual when surgically removed.</p> <p>Metastases never occur.</p> <p>Not harmful to host unless located in area where it compresses tissues or obstructs vital organs.</p> <p>Does not produce cachexia (weight loss, debilitation, anemia, weakness, wasting)</p> <p>Very good.</p> <p>Tumor generally removed surgically.</p>	<p>:Cells too abnormal to perform any physiologic functions.</p> <p>Occasionally a malignant tumor arising in glandular tissue secretes hormones.</p> <p>Recurrence common following surgery because tumor cells spread into surrounding tissues</p> <p>Metastases very common.</p> <p>Always harmful to host. Causes death unless remove surgically or destroyed by radiation or chemotherapy. Causes disfigurement, disrupted organ function, nutritional imbalances. May result in ulcerations, sepsis perforations, hemorrhages, tissue slough. Almost always produces cachexia, which leaves person prone to pneumonia, anemia, and other conditions</p> <p>Depends on cell type and speed of diagnosis.</p>
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		<p>Poor prognosis if cells are poorly differentiated and evidence of metastatic spread exists.</p> <p>Good prognosis indicated if cells still resemble normal cells and there is no evidence of metastasis.</p>
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METASTASIS

Metastasis disease is the major cause of death from cancer. A metastasis is a tumor that is distant from the primary tumor. The cell from the primary tumor that give rise to these metastases can be spread in many ways. Metastases is determined by several factors : (1) How long the primary tumor as existed, (2) a high mitotic rate, (3) trauma such as that cause by a biopsy of the primary tumor, heat, (4) the tumor's proximity to a rich lymphatic or vascular network.

The following are the most common sites of metastasis:

LUNGS: from such primary sites as the colorectum, breasts, renal system, testes, and bones.

LIVER: from the lungs, colorectum, breasts, and renal system.

BRAIN: from the lungs breasts, gastrointestinal tract, renal system testes, uterus, and ovaries.

SPINAL CORD: from the lungs, breasts, prostate, renal system, and gastrointestinal tract.

BONE: from the lungs, breasts, renal system, and prostate.

Signs and symptoms of metastatic disease can be noticed by the sensitivity to the patient's complaints, changes in laboratory values and alterations in functions.

Normal cells are adherent to the other normal cells from which they are arisen. Malignant or cancer cells are less adherent and more mobile than normal cells. They have the ability to spread from the original site of the tumor to distant organs. This phenomenon is called metastasis. Neoplastic cells must progress through a sequence of complex stages to overcome multiple barriers and successfully spread to other sites. Failure to complete any stages in the metastasis cascade disrupts formation of metastasis. The metastatic cascade is of three stages. They are:

STAGE 1: Increasing tumor size, leading to tissue pressure and mechanical expansion may cause neoplastic invasion. As the malignant tumor grows, the cells at the center become hypoxic, and it begins to seek its own blood supply. Neoplastic cells from the primary tumor invade surrounding tissue and penetrate blood or lymph vessels. Loss of tumor cell cohesiveness with increasing motility is an important factor in the metastatic cascade. These cells can detach from the primary tumor and create defects in the basement membranes with resulting stromal invasion and spread into the circulation. As many as 10 to 10 cells per day may be found circulating in the bloodstream of clients with cancer.

STAGE 2: Cancer cells migrate via the lymph or blood circulation or by direct extension. The lymphatic system provides the most common pathway for the initial spreads of malignant cancer cells. Lymph node involvement is seen in about 50% of all fatal cancers. The blood vessels (both veins and arteries) carry cancer cells from the primary tumor to the capillary beds of the lungs, liver, and bones. Direct extension of tumors to adjacent tissues also occurs. For example, a breast cancer

may spread directly to the chest wall. In body cavities, cells may spread by gravity, resulting in new growths on other serosal surfaces. Cells shed by cancers of the ovary are often found to have fallen onto and “seeded” the entire peritoneal cavity with metastatic sites of the tumor. To complete this stage in the metastatic cascade, tumor cells must survive a variety of hemodynamic and immunologic challenges.

STAGE 3: Cancer cells are established at the secondary site. This may result from entrapment due to the size of the tumor clump, adherence to cells at the new site through specific interactions, or by binding to exposed basement membrane. Continued growth and proliferation at the metastatic site are also dependent on the development of its own blood supply (angiogenesis) and ability to evade eradication by immune responses. Cells from the metastatic site may then go on to disseminate to form additional metastatic lesions.

SIGNS AND SYMPTOMS PRESENT WHEN VARIOUS SYSTEMS INVOLVED:

RESPIRATORY: Cough, hemoptysis, wheezing, fever, dyspnea, chest pain, hoarseness, enlargement of neck with venous distention, clubbing of fingers.

METABOLIC: Nonspecific abdominal complaints (e.g., increasing distention), right upper quadrant mass, weight loss, anorexia, nausea, vomiting, signs and symptoms of cirrhosis (e.g., spider angioma and gynecomastia).

CENTRAL NERVOUS SYSTEM : Headaches, nausea, vomiting, disturbances in mental, motor, and/or sensory function, focal or generalized convulsive activity, visual field, speech, or auditory defects vertigo, dizziness, ataxia, nystagmus, depressed corneal reflex, facial paralysis, pain, disturbances in sensory and /or motor function, urinary urgency, difficulty initiating urination, retention and overflow incontinence, contralateral loss of temperature and pain sensation, ipsilateral loss of motor function, touch and position sense.

COMMUNICATION: Difficulty with speech and hearing.

PSYCHOLOGICAL : Expresses fear of disease progression and prognosis, anxiety, depression, anger.

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ONCOLOGIC EMERGENCIES OR COMPLICATIONS:

1) **HYPERCALCEMIA**: Hypercalcemia is a condition that exists when the serum calcium is above 11 mg/dl (normal range, 8.5 to 10.5 mg/dl). It occurs when the bones release more calcium into the extracellular fluid that can be filtered by the kidneys and excreted in the urine.

EPIDEMIOLOGY: It is observed most often in patients with

- | | |
|--------------------------|------------------|
| a) Multiple myeloma | e) Head and neck |
| b) Cancers of the breast | f) Esophagus and |
| c) Lung | g) Thyroid |
| d) Kidney | |

The most common cause of hypercalcemia is thought to be

- 1) Destruction of bone by invasive metastases
- 2) Tumor production of vitamin-D-like substances
- 3) Osteoclast-activating factors
- 4) Dehydration
- 5) Immobilization

PATHOPHYSIOLOGY

- 1) Patient with multiple myeloma have osteoclast activating factors (OAF) produced by abnormal plasma cells. This results in hypocalcaemia due to renal function inadequacy.
- 2) Due to hormone therapy with estrogen and ant estrogens -> they activate/ stimulate breast cancer cells to produce osteolytic prostaglandins with result in increased bone resolution.

II) SUPERIOR VENA CAVE SYNDROME

When the superior vena cave (SVC) is obstructed by an adjacent, expanding mass, venous blockage produces pleural effusion and facial, arm, and tracheal edema. Severe obstruction may result in brain edema and impaired cardiac filling.

EPIDEMIOLOGY

Causes:

- 1) Gastrointestinal tract metastases
- 2) Obstruction of the superior vena cave is thrombus in a central venous catheter.

SIGNS AND SYMPTOMS:

The common signs and symptoms of superior vena cave syndrome are thoracic vein distention, neck vein distention, and edema of the face, tachypnea, and plethora of the face, cyanosis, edema of the upper extremities, paralyzed true vocal cord, and/or Horner's syndrome. The patient may also complain of headache and visual disturbances. Brain edema and impaired cardiac filling may cause altered consciousness and focal neurologic signs.

DIAGNOSTIC STUDIES:

- 1) Venography
- 2) Radionuclide scans
- 3) CT scan
- 4) MRI

MEDICAL MANAGEMENT

1) RADIATION THERAPY:

a) Radiation therapy is quite effective for most cases of superior vena cave syndrome caused by cancer. Radiation therapy is palliative for superior vena cave syndrome in 70% of patient with lung cancer and in more than 95% with lymphoma.

b) Corticosteroids decrease the edema associated with inflammatory reactions following radiation-induced tumor necrosis. Steroids are administered for 3 to 7 days.

2) **CHEMOTHERAPY:** During the acute episode, the patient should be kept in Fowler's position. Diuretics may be helpful; however, the obstruction must be relieved to prevent cerebral anoxia, hemorrhage, or strangulation.

III) CARDIAC TAMPONADE

Cardiac tamponade is caused by the formation of pericardial fluid, which compresses the heart and causes life-threatening changes in cardiac function.

EPIDEMIOLOGY:

Cancers of the lung or esophagus grow by direct extension into the pericardium.

PATHOPHYSIOLOGY

The severity of tamponade depends on the rate of fluids formation and the volume accumulated. The normal diastolic filling is impaired by elevated pericardial pressures, and stroke volume is reduced. As stroke volume falls, hypotension, compensatory tachycardia, and equalization and elevation of the mean left atrial, pulmonary arterial and venous, right artial and vena cavalla pressure occur.

SIGNS AND SYMPTOMS:

Frequent signs of tamponade includes rapid, weak pulse; distended neck veins during inspiration (Kussmaul's sign); pulses paradoxus inspiratory decrease in arterial blood pressure of more than 10mm Hg from baseline); ankle or sacral edema; pleural

effusion; as cited; hepatosplenomegaly; lethargy; and altered level of consciousness. The patient may complain of dyspnea, cough, and retrosternal pain that is relieved by leaning forward.

Occasionally a patient with a large effusion develops hoarseness, hiccups, nausea, vomiting, and epigastric pain.

DIAGNOSTIC STUDIES

- Chest x-ray
- Electrocardiogram
- Echocardiogram
- Right heart catheterization Pericardiocentesis
- Pericardial biopsy

MEDICAL MANAGEMENT

a) **PERICARDIOCENTESIS:** Emergency pericardiocentesis is performed when the patient develops one of the following cyanosis, dyspnea, shock or impaired consciousness.

b) **SCLEROSIS:** Tamponade can be controlled by inserting an indwelling pericardial catheter until pericardial drainage stops; then tetracycline (500 to 1000 mg) is instilled through the cannula and flushed with normal saline. The procedure is repeated every 2 to 3 days until there has been no fluid drainage in the preceding 24 hours.

c) **RADIATION THERAPY:** Radiation therapy has been reported to control more than 50% of malignant pericardial effusions.

d) **PERICARDIECTOMY:** Pericardiectomy is needed if radiation-induced pericardial disease cannot be controlled with conservative medical management.

e) **CHEMOTHERAPY:** After the patient is clinically stable, systemic chemotherapy should be administered, if effective treatment is available e.g., as in lymphoma may also be effective in leukemia and breast cancer patient with pericardial effusion.

IV) DISSEMINATED INTRAVASCULAR COAGULATION

Disseminated intravascular coagulation (DIC) is a syndrome characterized by indiscriminate formation of fibrin in small blood vessels throughout the circulation.

EPIDEMIOLOGY:

Malignant tumors arising from the pancreas, stomach, or colon may produce musing; the silica acid component of this muslin may directly activate clotting factor X, triggering systemic thrombin generation and acute disseminated in travascular coagulation.

PATHOPHYSIOLOGY:

An uncontrollable triggering of the internal or external pathway of the clotting cascade occurs, resulting in accelerated coagulation and the formation of excessive thrombin. As long as coagulation and occurs, the fibrinolytic system is activated, so that clotting and bleeding continue at a life-threatening pace.

SIGNS AND SYMPTOMS:

Signs and symptoms of disseminated intravascular coagulation include systemic bleeding, ranging from petechiae to hematuria to acute gastrointestinal hemorrhage; organ dysfunction (e.g., pulmonary emboli, thromboemboli in the extremities, and renal failure); decreased blood pressure and pulse; cool, clammy skin; anemia; pallor; and shortness of breath. Hemorrhagic signs of disseminated intravascular coagulation include persistent oozing from venipuncture sites; bleeding around intranasal, end tracheal, and urethral catheters; hemoptysis; hematemesis; and Melina.

DIAGNOSTIC STUDIES:

- Thrombin time, prothrombin time, partial thromboplastin time
- Platelets
- Fibrinogen
- Fibrin-split products
- Erythrocytes

MEDICAL MANAGEMENT

a) **MEDICATIONS:** Disseminated intravascular coagulation rapidly resolves when infection are controlled by appropriate antibiotic therapy.

b) **BLOOD COMPONENT THERAPY:** Administration of platelets may prevent intracranial bleeding in patient with acute promyelocytic leukemia; a continuous infusion of fresh-frozen plasma may control bleeding in patient with gastrointestinal bleeding secondary to tumor-induced disseminated intravascular coagulation.

V) **CAROTID RUPTURE:** Carotid rupture or blowout is the loss of large amounts of blood via a damaged artery, with resultant life-threatening bleeding.

PATHOPHYSIOLOGY: Because of infection there will be vessel weakness, leading carotid rupture.

SIGNS AND SYMPTOMS: The first sign of carotid blowout usually is a small trickle of blood from the neck area. The rupture may be sudden, with forceful expulsion of large volumes of blood from the artery.

MEDICAL MANAGEMENT:

a) **DIGITAL PRESSURE:** If carotid blowout occurs, a saline-soaked cotton dressing is wrapped around the two middle fingers and constant digital pressure is applied directly to the area over the artery. The nurse must not check to see whether the bleeding has stopped nor attempt to apply a hemostat because of the likelihood of further blood loss. A clot of blood is drawn and sent to the blood bank for typing and cross-matching, and an intravenous line is started. Only after the patient is in the operating room and the operative area has been prepared can the pressure be released.

b) **SURGERY:** The treatment of choice is ligation of the damaged vessel.

PATHOPHYSIOLOGY: In addition to compression caused by metastatic disease, both spinal cord and nerve root compression can occur secondary to an epidural tumor or to vertebral collapse from destructive bony metastases.

SIGNS AND SYMPTOMS: Progressive central or radicular back pain, which often is aggravated by lying down, weight bearing, coughing, sneezing, or the Valsalva maneuver and is relieved by sitting. Neurologic symptoms are sensory changes such as numbness, paresthesia, and coldness. Although bladder and bowel dysfunction are rarely the first signs of cord compression, metastases to the caudal equine often produce impaired urethral, vaginal, and rectal sensation; bladder dysfunction; saddle anesthesia; and decreased sensation in the lumbosacral dermatomes.

DIAGNOSTIC STUDIES:

- Myelogram or computed tomography (CT) scan
- Magnetic resonance imaging (procedure of choice)
- Cerebrospinal fluid

MEDICAL MANAGEMENT:

- Radiation therapy
- Surgery

- Laminectomy
- Medications
- Corticosteroids, chemotherapy, hormonal therapy.

SYNDROME OF INAPPROPRIATE ANTIDIURETIC HORMONE

The abnormal production or stimulation of antidiuretic hormone results in excessive water and hyponatremia.

EPIDEMIOLOGY: Is seen in patients with small cell lung cancer, lymphoma, and pancreatic and prostate cancers.

PATHOPHYSIOLOGY: Antidiuretic hormone, which normally is released from the posterior pituitary in response to increased plasma osmolarity or decreased plasma volume, may be abnormally produced or stimulated. The result of this alteration are excessive water retention and hyponatremia.

SIGNS AND SYMPTOMS: Signs and symptoms include confusion, irritability, weakness, lethargy, headache, hyporeflexia, nausea, vomiting, anorexia, diarrhea, and weight gain without edema.

DIAGNOSTIC STUDIES:

- Serum sodium level
- Serum osmolarity
- Urine sodium level

MEDICAL MANAGEMENT:

- 1) Medications: Antineoplastic agents, antibiotics, diuretics, demeclocycline
- 2) Intravenous fluids: Hypertonic saline

VIII) SEPSIS

Bacterial invasion of the circulatory system results in inadequate tissue perfusion.

EPIDEMIOLOGY: This oncologic emergency is most often seen in neutropenic patients whose immunologic response is weakened by the decreased number of functional neutrophils. The most common causative agents are gram-negative bacteria.

PATHOPHYSIOLOGY: Sepsis result from the release of an end toxin from the cell walls of gram-negative bacteria, which causes increased capillary permeability and leakage.

SIGNS AND SYMPTOMS: Signs and symptoms of sepsis include fever; chills; restlessness; confusion; tachycardia; hypotension; decreased pulses; cool, clammy skin; decreased urinary output; and bleeding from one or more sites (which may be caused by disseminated intravascular coagulation).

DIAGNOSTIC STUDIES:

- Blood cultures
- Chest x-ray
- White blood cell count
- Arterial blood gas analysis
- Prothrombin time and partial thromboplastin time.

MEDICAL MANAGEMENT:

- Medications
- Antibiotics
- Supportive care_

Intervention include administering antibiotics as prescribed; reducing the temperature with antipyretics, ice packs, a hypothermia blanket, and other techniques; fluid volume replacement; monitoring of vital signs, arterial blood gas values, and hemodynamic stability; and performing blood cultures as needed.

IX) TUMOR LYSIS SYNDROME

Tumor lysis syndrome is a metabolic imbalance caused by rapid cancer cell death; it result in uric acid nephropathy.

EPIDEMIOLOGY: Chronic myeloproliferative syndromes, multiple myeloma, and squamous cell carcinoma of the head and neck.

PATHOPHYSIOLOGY: Rapid cell death increases the production of uric acid and result in hyperuricemia and deposition of uric acid crystals throughout the urinary tract.

SIGNS AND SYMPTOMS: Include oliguria, anuria, urine crystals, flank pain, hematuria, nausea, vomiting, cardiac dysrhythmia, muscular cramps, tetany, lethargy, and confusion.

DIAGNOSTIC STUDIES AND FINDINGS:

- Serum uric acid -> Elevated
- Blood urea nitrogen, creatinine -> Elevated
- Serum phosphate -> Elevated
- Serum calcium -> Decreased
- Urinary uric acid-to-creatinine ratio -> >1
- Renal ultrasound -> To exclude urethral obstruction

MEDICAL MANAGEMENT:

- Medications
- Allopurinol, calcium supplements
- Intravenous fluids
- Dialysis.

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NURSING RESEARCH

Caring for patients with head and neck cancer during radiation therapy:

The study done by: Tangappa . B:

Place: Government Rajaji Hospital, Madurai.

Population: 60 patients receiving radiation therapy.

Study: A study to evaluate the effectiveness of structured teaching programme on care during radiation therapy among patient's with head and neck cancer.

Purposive sampling technique was used to select 60 patients who were receiving radiation therapy over head and neck region. Data collects tools consisted of structured interview scheduled to assess the knowledge and practice. First a pretest of knowledge and practice was assessed. After the pretest the structured teaching programme was given to the experimental group. Then post test knowledge and practice was assessed for both experimental and control groups. Data were analysed by using descriptive and inferential statistics.

Conclusion:-

The knowledge regarding care during radiation therapy among patient's who had received radiation therapy over head and neck region improved significantly after they had undergone structured teaching programme.

Effectiveness of teaching programme on prevention and early detection of cancer.

Study done by: Prathibha swamy

Place :Udupi – taluk, Karnataka state.

Population: 99 teacher trainees in college of education.

Findings: The major finding of the study were that the structured teaching programme was effective in increasing the knowledge of the teacher trainees as exhibited in the

post test level of knowledge and a significant association existed below the sex and the pre test level of knowledge.

SUMMARY:

Today we have reviewed in detail about the definitions, incidence, normal cell division, abnormal cell division, difference between Benign and malignant tumors, epidemiology, carcinogenesis , metastasis, warning signals , staging and grading of tumors, diagnostic procedures, various treatment modalities, complications, nursing care, rehabilitation, prevention, early detection, screening and dietary prevention, recent research of Aberrant cell growth.

CONCLUSION:

Let us make our lives happy in preventing the preventable diseases and lay ourselves in hands of the almighty God for His protection in areas which are beyond our control.

Rehabilitation

Cancer rehabilitation helps a person with cancer obtain the best physical, social, psychological, and work-related functioning during and after cancer treatment. The goal of rehabilitation is to help a person regain control over many aspects of their lives and remain as independent and productive as possible. Rehabilitation can be valuable to anyone with cancer and those recovering from cancer treatment.

How cancer rehabilitation can help

Rehabilitation can improve the quality of life for people with cancer and their families, including:

- Improving physical strength to help offset any limitations from cancer and cancer treatment
- Helping the person with cancer become more independent and less reliant on caregivers
- Helping the person with cancer adjust to actual, perceived, and potential losses due to cancer and cancer treatment
- Reducing sleep problems
- Lowering the number of hospitalizations

Cancer rehabilitation services

Many cancer centers and hospitals offer a variety of cancer rehabilitation services to their patients, or are willing to help them identify local resources to assist with rehabilitation. Patients and family members are encouraged to be active, informed

partners in the rehabilitation process and seek out the services they need. Talk with a nurse or social worker about the services you are interested in:

- Patient and family education and counseling
- Pain management techniques and medications
- Nutritional counseling
- Exercise programs to help to build strength, endurance, and mobility
- Smoking cessation education and support programs
- Assistance with activities of daily living (ADLs) such as eating, drinking, dressing, bathing, using the toilet, cooking, and basic housekeeping

The cancer rehabilitation team

Comprehensive cancer rehabilitation is provided by a team of health care professionals who work closely together. The team helps a person adapt to his or her situation, whether the changes are temporary or permanent. These professionals may include any of the following:

Oncologist. This is a medical doctor who specializes in the care and treatment of people with cancer. He or she may be responsible for coordinating the cancer rehabilitation team.

Physiatrist (also called a rehabilitation specialist). This person is a medical doctor who treats injuries and illnesses that affect how you move, including the treatment of pain.

Rehabilitation nurse. A rehabilitation nurse specializes in assisting people with a chronic illness, disability, or injury to restore physical functioning and adjust to a changed environment or lifestyle. A rehabilitation nurse helps people with cancer increase independence, reduce potential complications after cancer treatment, provide patient and family education and counseling, and assist in case management.

Physical therapist. A physical therapist works with patients to help restore mobility and physical functioning, while preventing further disability. This service may be particularly important for people who have lost muscle tone because of prolonged bed

rest, have trouble with balance, or need to use canes or other assistive devices after cancer treatment.

Occupational therapist. An occupational therapist helps people prevent and live with illness, injury, and disability. For example, an occupational therapist may help someone avoid lymphedema after breast cancer surgery. In addition, occupational therapists are trained to evaluate the layout of the home, school, or workplace to increase patients' mobility and assist with activities of daily living.

Recreational therapist. A recreational therapist helps a person with cancer reduce stress, anxiety, and depression by using games, exercise, arts, crafts, and music to build confidence and strengthen personal skills.

Dietitian. A dietitian is a food and nutrition professional who answers questions about nutrition and helps people with cancer plan menus to cope with special needs. Dietitians may provide nutritional counseling; develop meal plans; and monitor the body weight, caloric, and dietary needs of a person with cancer.

Psychologist/psychiatrist. These and other mental health professionals work to address the emotional, psychological, and behavioral needs of the person with cancer and his or her family. These may be longstanding or have resulted from the illness and consequences of treatments. These mental health professionals can help patients process their experience and find ways of coping with changes in their lives.

Social worker. A social worker may counsel patients and families in discharge planning (transferring care from the hospital to home) and home care, help with coping skills and lifestyle adjustments, and facilitate support groups. Social workers are also trained to help people living with cancer cope with financial concerns and provide links to community resources.

Home-health aide. This person provides personal care services by helping people with ADLs, such as bathing, dressing, using the toilet, and moving around. Some home health aides are specially trained to provide more complex services, under the supervision of a nurse.

Vocational counselor. A vocational counselor specializes in helping people recovering from cancer find and keep a satisfying job. This is important for those who

may no longer be able to return to their previous position because of physical or emotional limitations.

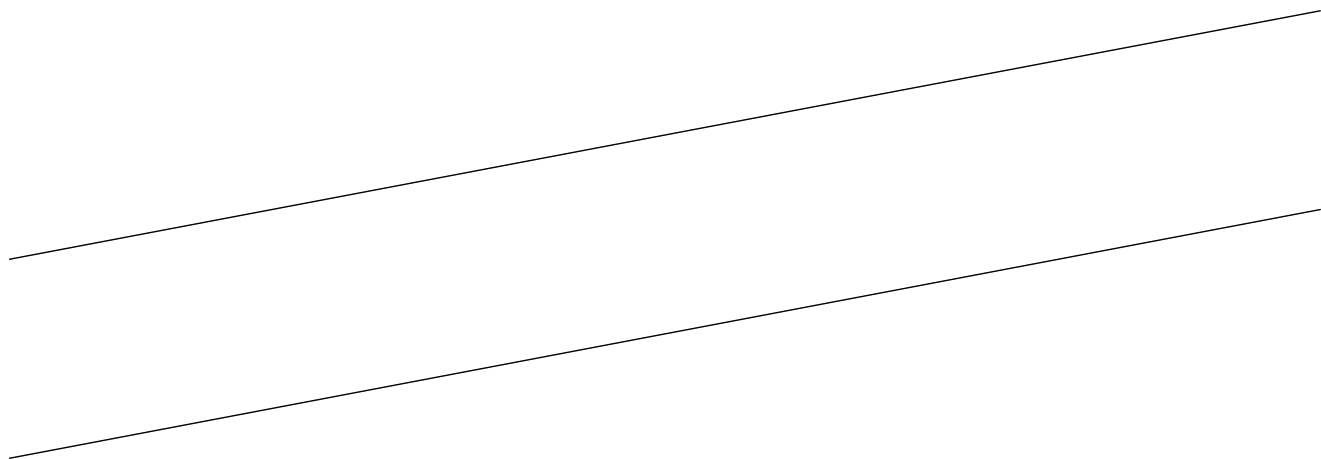
Clergy member/chaplain. This professional is a trained member of the clergy who offers spiritual support and rituals for patients and their families, facilitates support groups, and offers support in health crisis situations. Most hospitals have clergy on staff who work with people of all faiths. Some people may prefer to work with their own clergy person.

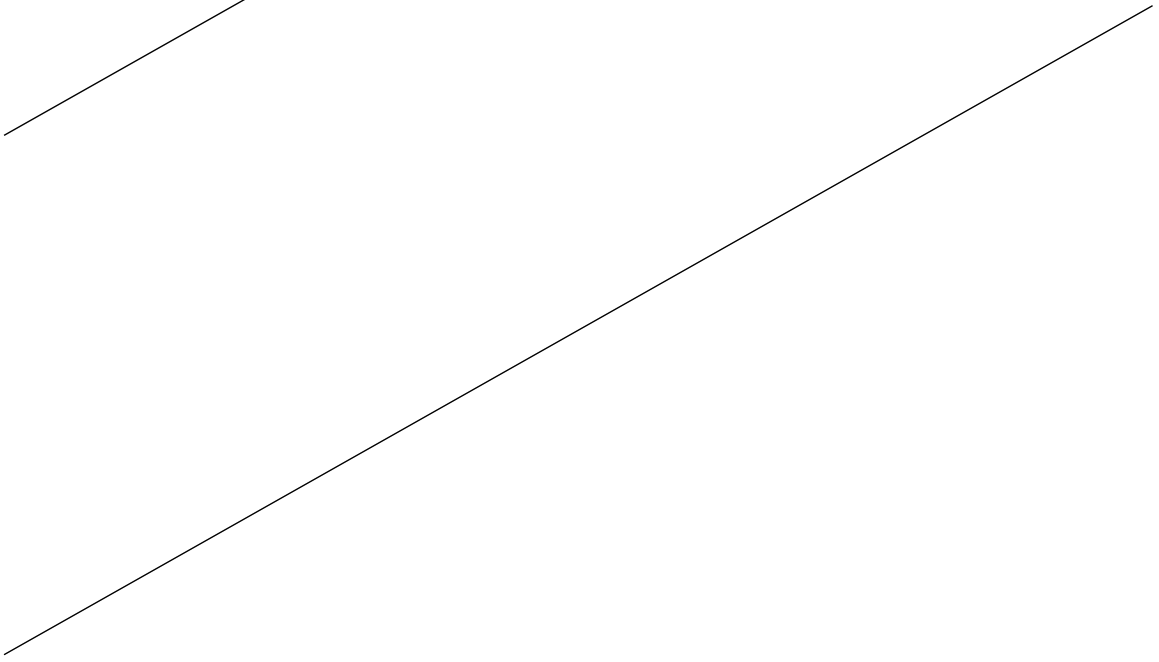
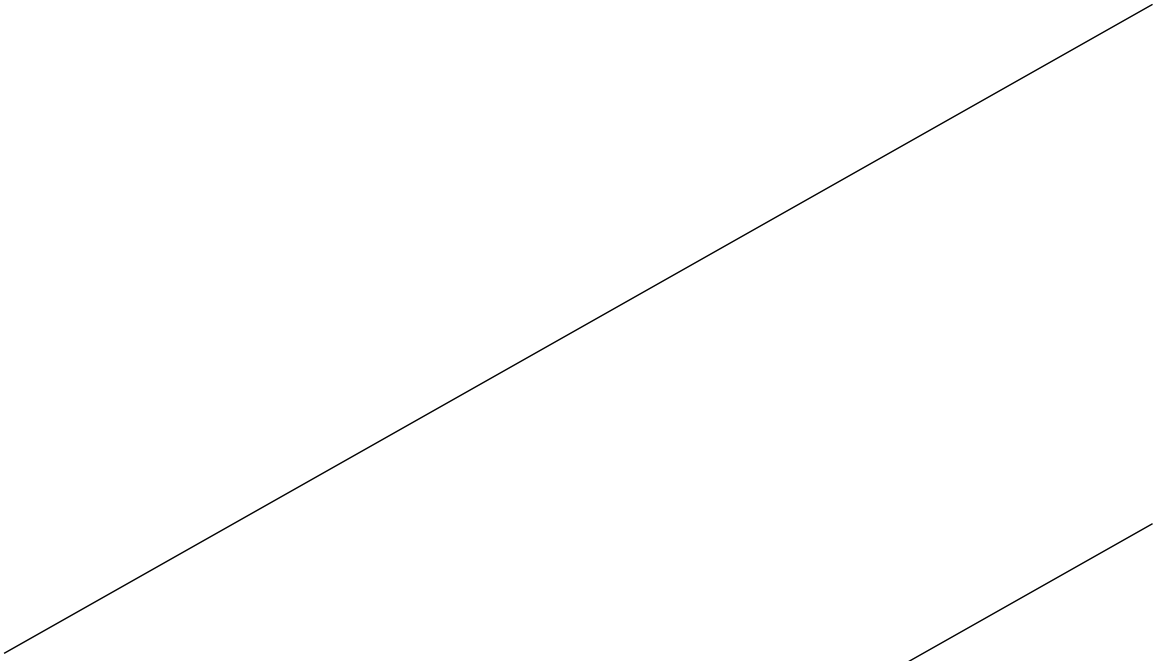
Case manager. A case manager helps to design and monitor the cancer rehabilitation program. Case managers often act as the liaison between the person with cancer, the cancer rehabilitation team, and the insurance provider.

INCIDENCE

DIFFERENCE
BETWEEN
BENIGN AND
MALIGNANT
TUMORS

METASTASIS,
STAGING AND
GRADING OF
CARCINOMA





PREVENTION,

EARLY

DETECTION

AND

SCREENING

RESEARCH,
SUMMARY
AND
CONCLUSION

