

Principles of Nursing Care in Oncology Practice





Director's Message



I am happy to know that the Regional Cancer Center (RCC) is organizing its second Continuing Medical Education (CME) programme, this time on *Gynaecological Malignancies* with a separate CME session on *Nursing Care in Oncology*. I am also happy to know that a separate bulletin on nursing care in oncology is released on the occasion that covers most of the articles discussed in the CME and also contains articles by nursing faculty for the benefit of working in cancer institute.

According to the National Cancer Control Programme, 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 head and neck, lungs, oesophagus and stomach amongst men and cervix, breast and head and neck 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. 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.

Considering the enormous efforts that are needed in our fight against cancer, the CMEs for the nursing personnel are as essential as for physicians since they are integral part in the management of cancer. Services of the nursing personnel in the Palliative management of cancer are indispensable. Ironically most of the nursing colleges do not have necessary infrastructure in giving training on oncological practices.

Therefore, the CME on nursing care in oncology practice is aimed in bridging this gap and I am sure that the topics discussed in this CME will be highly useful to all nursing delegates including student nurses.

I wish this CME all the success.

Dr.K.S.V.K.Subba Rao
Director, JIPMER



Editorial



Greetings to all...

I am glad to interact with you through this bulletin. The radiotherapy facility was available from the beginning of JIPMER in 1964 and the department of radiotherapy has been functioning independently since 1986 after the bifurcation of the Department of Radiology into Department of Radiotherapy and Department of Radiodiagnosis. The Department of Radiotherapy gets more than 2000 new cancer patients every year and the number is growing. The Regional Cancer Center (RCC) status was awarded to the department of radiotherapy in 2002 making it a tertiary / referral cancer care center with necessary infrastructure to treat all type of cancer patients under one roof. The RCC, JIPMER is poised for developments in terms of augmentation with the state-of-the-art equipment, of increased manpower in all levels. Under Phase I of the RCC project, a separate building for RCC with facilities for OPD, 82 in-patient beds (including 20 special-ward beds) was established. Now, the Phase II of the project has been approved in which a separate equipment block will be constructed as an extension of RCC OPD block. As per the terms of contract, the facilities in the equipment block will be ready in one-year time.

It is a well established fact that the nursing personnel play an indispensable role as a team in the management of cancer patients. This Continuing Medical Education (CME) programme on "*Nursing Care in Oncology Practice*" has been chosen to share the essence of the latest developments and the expectations from the nursing personnel in the management and treatment in oncology practice. I am sure that this CME will be highly useful to all nursing personnel and nursing faculty to update their knowledge for better and safe oncology practice.

This bulletin on Nursing Care in Oncology contains the abstracts of all the presentations during the CME on Nursing Care in Oncology apart from articles by nursing faculty for the benefit of both practicing nursing personnel and student nurses.

My appreciations to the members of the editorial team for their efforts in making this bulletin a highly useful document.

My best wishes to all the readers.

Dr.K.S.Reddy
Director, RCC

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Objectives of Nursing Care in Oncology Practice

(Mrs. Santhy Selvam, Staff Nurse, JIPMER)

Cancer management is a multi disciplinary endeavour and thorough knowledge about oncology nursing forms the basis for effective patient care. Ideal nurse uses nursing process to assess, plan, implement and evaluate patient care.

Assessment:

Oncology nurse should systematically and continually collect data regarding the health status of the patients. Oncology nurse should assess patient's physical and emotional status, past history and family history. It is expected to register necessary history and details about the disease and they must be aware of results and general implication of all relevant laboratory, pathology and imaging studies.

Planning:

Oncology nurse develops an individualised and holistic approach to attain expected outcomes.

Implementation:

Oncology nurse implements the plan of care.

Evaluation:

Oncology nurse systematically and regularly evaluates the patient's response. These processes permit an organised and systematic approach to nursing care.

Other main objectives of oncology nursing care include

- A) Patient education
- B) Co-ordination of care
- C) Supportive role

Patient Education:

Oncology nurse must educate the patients and their families about the disease. Such educations include structured and unstructured experiences, to help patients to cope with their diagnosis and treatment. Nurses must educate about primary prevention, screening, early diagnosis and treatment options available.

Co-ordination of care:

The oncology nurses play a vital role in multiple and complex technologies more commonly employed in cancer diagnosis and treatment. The nurse should serve as the patient's first line of communication. Patients and their families must be encouraged to communicate freely with nurses. It favours them to recognise oncology emergencies and to report immediately to treating physician.

Supportive care:

Oncology nurses are closely involved in numerous

supportive care issues encountered by cancer patients and their families. Nurses must have basic knowledge about pain management. Nurses must provide adequate information about the drug and its common side effects. Nurses must alleviate the apprehensions about the drugs and their adverse effects. Nurses must promote patient compliance with therapy and required followup.

Nursing Alerts in Chemotherapy Administration

The oncology nurse plays an important role in assessing and managing most of the complications experienced by patients receiving chemotherapy. These problems are often serious and require active interventions. As a result, it is necessary for a NURSE to be ALERT while administering chemotherapy.

These are few alerts to be kept in mind at the time of chemotherapy administration:

1. Don't mix chemotherapeutic drugs with other drugs.
2. Double check the chart for the complete chemotherapy protocol order including Patient name, drug name, dosage, route and rate of administration.
3. Check if the drug's dosage depends on certain laboratory values.
4. Do check to see if an antiemetic, special fluid, diuretic or electrolyte supplements to be given before, during or after chemotherapy.
5. Evaluate the patient's level of understanding and ensure the consent form has been signed.
6. Wear gloves while handling drugs at all times.
7. Never test vein patency with chemotherapeutic drug.
8. Monitor for signs of hypersensitivity or extravasations during IV administration.
9. To prevent aerosol dispersion of chemotherapeutic drug, don't clip the needle; place the intact needle in an impervious container for incineration.
10. Dispose IV bags, bottles, gloves, tubing, needles and syringes in a properly labelled and covered container.
11. Wash hands thoroughly after giving chemotherapeutic drugs.
12. Monitor vital signs throughout infusion. Record the type and amount of drug received by the patient.

Maintaining a list is especially important if the patients have received drugs that have cumulative effects and can be toxic to organs like heart and kidneys.

Oncology nurse provide effective cancer care. They are integral component of cancer care team. With developing technological advancement and management, nursing care will develop as a dynamic element in the health care delivery.

Holistic Approach to Cancer Patients

(Mrs. Leela Bai William, Staff Nurse, JIPMER)

Oncology nursing care is intended for all age groups. Nursing care is usually framed on evidence-based concepts to patient's problems in a particular setting. With rapid development in treatment options available, nursing role in cancer management is increasing.

Major problems encountered in care of cancer patients are as follows:-

Infection:

Majority of the cancer patients are prone to infection while on treatment. These are a few steps that every nurse should follow to prevent the spread of infection.

- ✍ Initiate protective isolation and neutropenic precautions.
- ✍ Use strict aseptic technique for all procedures and ensure frequent and thorough hand washing.
- ✍ Check for vital signs q 4h and report to treating physician if patient develops fever.
- ✍ Monitor WBC count and differential count every day.
- ✍ Assist the patient in practice of meticulous personal hygiene.
- ✍ Instruct the patient to use well-cooked foods and to avoid raw fruits & vegetables and hard & spicy foods.
- ✍ Inspect the portal of entry of pathogens such as IV sites, wounds, skin folds, bony prominences, oral cavity and perineum.
- ✍ Change the central venous catheter site dressings and infusion sets every 48 hrs.
- ✍ Instruct the patients to avoid crowds and those with infections.
- ✍ Use stool softeners to prevent constipation and straining.
- ✍ Administer prescribed antibiotic, antifungal and antiviral medications.

Bleeding:

Other major problem encountered by cancer patients is bleeding. Sometimes it will be troublesome. Ulcerative growth may sometimes bleed profusely. Haematological malignancy patients may bleed due to disease. Some of the bleeding may be due to drug induced or post surgical bleeding. Common bleeding

include skin, mucous membrane, GI tract, genitor urinary and respiratory sites. Gross haemorrhage in stool, urine, sputum & vaginal bleeding should be monitored and reported immediately to the treating physician. Cold compress, pressure bandage may alleviate bleeding to some extent. However all bleeding should be reported irrespective of amount of bleeding.

Skin Problems:

The integrity of skin and tissue are at risk in cancer patients due to effects of chemotherapy, radiation therapy, surgery and invasive procedures carried out for diagnosis and therapy. As part of the assessment, the nurse identifies which of these predisposing risk factors are present and assesses the patient for other risk factors including nutritional deficits, bowel and bladder incontinence, immobility, immunosuppression, multiple skin folds and changes related to aging. Skin lesions or ulcerations secondary to tumors are noted. Alopecia is another form of tissue disruption common to cancer patients who receive chemotherapy or radiation therapy. The nurse also assesses the psychological impact of these side effects on the patient and family. The nurse should support the patients and their family in coping with disturbing effects of therapy such as hair loss and changes in body image etc.

Fatigue:

In recent years, fatigue has been recognized as one of the most significant and frequent symptoms experienced by patients receiving cancer therapy. The psychological and physiological stressors that can contribute to fatigue are pain, nausea, vomiting, constipation, fear, anxiety and cancer related cachexia & anorexia. The nurse assesses patient's emotions, lack of energy, lack of motivation and inability to concentrate. These problems can be tackled by counseling patients properly about their disease. Patients should be motivated for creative activities and peer group discussions. Small frequent meals- rich in protein and carbohydrates should be encouraged.

Diet and Hygiene in Prevention of Cancer

(Mrs. S. Arul Nisha, M.Sc(Nsg), College of Nursing, JIPMER)

The national cancer institute estimates that one –third of all cancer deaths may be diet related.

How does a healthy diet prevent cancer?

Improve immune system

A healthy diet is one that is rich in fruits, vegetables & whole grains, promotes a strong healthy immune system that is better able to recognize & fight disease causing elements.

Reduces free radical formation & damage

Free radicals are formed as a natural result of cellular metabolism. Over time, free radical cause damage to cellular DNA & disrupt cellular turnover and cell replication. Free radical are believed to increase the rate of aging in the body, promote the formation of cancer & lower the body immune system.

Ensures proper nutritional uptake

In order for a body to function at optimal level, one should take high – quality, nutritional food from a variety of food groups.

The following foods have the ability to help stave off cancer & some can even help inhibit cancer cell growth

Fiber

Whole grains (such as rye , brown rice & whole wheat) contain high amount of insoluble fibre may help protect against breast & uterine cancer

Vegetables

1. Tomatoes - It contains lycopene, an antioxidant inhibits the proliferation of cancer cells
2. Carrots - It contains a lot of beta carotene & also a substance called falcarinol that is found in carrot has been found to reduce risk of cancer.
3. Cruciferous Vegetable (broccoli, cauliflower & cabbage) - It contains tow antioxidants lutein & zeaxanthin that may help to decrease cancer growth
4. Mushroom - It contain polysaccharides especially lentinan, powerfull component that help in building immunity. They also have a protein called lectin ,which attacks cancerous cells & prevent them from multiplying.
5. Garlic - has immune–enhancing allium compounds (diallyl sulfides) that appear to increase the activity of immune cells to fight against cancer & indirectly help

break down cancer causing substances. These substances also help block carcinogens from entering cells & slows tumor development.

6. Sweet Potatoes - It contains many anticancer properties including betacarotene ,which may protect DNA in the cell nucleus from cancer causing chemicals outside the nuclear membrane.
7. Seaweed & Other Sea Vegetables – It Contains beta – carotene, protein, vitaminB12, fiber, chlorophyll, as well as chlorophylones –important fatty acids that may help in the fight against breast cancer.

Fruits

1. Oranges & Lemons - It contain limonene which stimulates cancer–killing immune cells (lymphocytes).
2. Papayas - It contains antioxidant property & may also reduce absorption of cancer causing Nitrosamines. It also contains folacin (also known as folic acid) which has been shown to minimize cervical dysplasia .
3. Grape Fruits – it contains monoterpenes , believed to help prevent cancer by sweeping carcinogens out of the body.
4. Figs – contains benzaldehyde in highly effective in preventing cancer.

Nuts - It contains the antioxidants quercetin &campferol that may suppress the growth of cancer.

Soy Products - contain several types of phytoestrogens – weak nonsteroidal estrogens that could help prevent breast & endometrial cancer by blocking & suppressing cancerous changes.

Tea- (green tea & black tea) contains certain antioxidant known as polyphenoles (catechins) which appear to prevent cancer cell from dividing.

Hygiene

1. Practice meticulous genital cleanliness – have a hot bath and wash thoroughly
2. Improvement of personal hygiene such as hand, mouth, skin and genitals
3. Use barrier contraceptives
4. Avoid multiple sexual partners
5. Use sanitary napkins instead of tampons

Food Hygiene

Fruits and vegetables should be washed thoroughly before consumption.

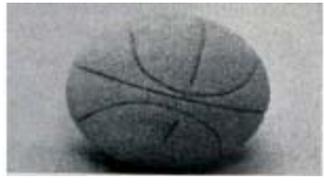
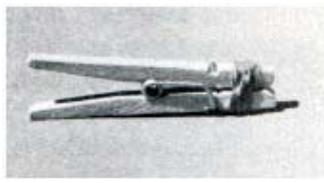
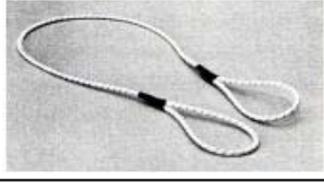
Exercise Intervention for Cancer Rehabilitation - A Patient Guide

(Mrs. V.R. SELVAAMBIGAI, M.Sc , Ph.D, Sister Tutor, College of Nursing, JIPMER)

Exercise: When you have been ill or inactive for a long time, you may have a difficult time regaining your strength. Your joints may seem stiff and your muscles weak. Your body is suffering from disuse. The longer you remain inactive, the longer it will take to regain your lost strength and return to active living. To get back on your feet again, you need to gradually put your muscles and joints to use by exercises that limber and strengthen them.

Dynamic Resistive and Isometric Exercise : Dynamic resistive exercise is performed with weights or resistive tubing of some type. Isometric exercises are performed with the same types of resistance, but do not involve joint movement. Examples are holding in your stomach, tightening buttocks, holding the leg straight. Some of the exercises in Stage I and II require some items as follows

Stage I: Beginning To Move: Stage I exercises are simple range-of-motion exercises that require little exertion and can be done when you are bedridden. Remember it is important to exercise in order to maintain the muscle tone and joint mobility. All of these exercises are done lying on your back in bed. Try to exercise twice a day, more if you feel like it. Start with three to five repetitions of each exercise and work up to 10 to 20 repetitions. Remember, if your muscles become tired or painful, stop and rest. Omit exercises that seem too difficult - try them again another day tired, and rest before proceeding. Begin each exercise session with a deep breathing exercise. Exercise safely. Have someone present to assist you if possible. Having someone there with you will also make exercising more enjoyable

Breathing Bag	A two or three liter plastic bag with a mouthpiece, used to increase lung capacity and to avoid pulmonary complications, Stage I. Substitute a soft balloon or a surgical glove with a mouthpiece.	
Exercise putty	Elastic putty used in Stage I to strengthen and coordinate hands and fingers. You can substitute clay or Silly Putty.	
Sponge ball	A lightweight sponge ball about 4 inches (10 cm) in diameter. Used in Stage I for general limbering, strengthening and coordination exercises.	
Clothespin	An ordinary wooden clothespin used in Stage I to coordinate hands and fingers. For added resistance, wrap a rubber band around the clothespin's tip.	
Exercise stretcher	¹ An elastic rope with looped handles, used in Stage II exercises for strengthening and stretching the large muscles.	
Jump rope	Any type of jump rope will suffice. If you are bed bound you can tie the rope to the foot of the bed and use it to pull yourself to a sitting position. Also used in jump-rope exercises. You can substitute a piece of rope or clothesline.	

Stage II: Increasing Physical Activity : You are ready for Stage II when you can spend part of the day out of bed sitting in a chair and can do ten to twenty repetitions of Stage I exercises with ease. As in Stage I, try to exercise twice a day. Start with three to five repetitions of each exercise and work up to ten to twenty repetitions. Remember, if your muscles become tired or painful, stop and rest. Repeat only one or two of a series if you are tired, and rest before proceeding. Exercise safely. Attach equipment securely.

Stage III: Up And Around : Once you start spending the whole day out of bed, walking around the house, and resuming some of your normal daily activities, you are ready for Stage III exercises. These are vigorous exercises, and safety precautions should be observed when using a chair. Try to exercise four to five times a week; and in the same way as with Stages I and II, begin with three to five repetitions of each exercise, and work up to ten to twenty repetitions.

Sports and Recreation : A regular exercise program will keep your body fit and is good for your spirits as well. When you are able to do Stage III exercises comfortably, think of adding some sports and recreational activities to your exercise program. You can work up to these gradually: Climb stairs four or five times daily. Take walks. Pace yourself: go one block the first time and then try to increase your distance daily. Gardening is an excellent exercise if you enjoy it. At first someone may have to assist you with the heavier work. Even a small plot will provide you with exercise plus fresh air, sunshine, and a sense of accomplishment, Bicycle. Plan your routes to be more or less strenuous to fit your needs. Jumping rope is vigorous exercise that gives overall muscle toning and coordination. Swim or, if you feel energetic, join a health club and make use of the saunas and steam room as well as the pool. Water is much easier to exercise in because it supports your limbs and makes it easier to move about.



Breaking Bad News

(Dr. M.Mangala devi, Senior Resident, Dept. of Radiation Oncology, RCC, JIPMER)

Patients and relatives need time to absorb information and to adapt to bad news. Health professionals need good communication skills, including sensitivity and empathic active listening. Breaking bad news takes time, and issues often need to be discussed further and clarified as more information is imparted. Balance is to be made between fully informing the patient about their disease and prognosis, completely overwhelming them with facts and figures, or providing only minimal and inadequate information. While it is important to avoid being patronizing, it is also important not to cause distress by “information overload”.

Preparing to tell bad news

Acquire all the information possible about the patient and their family. (A genogram is particularly useful in quickly assimilating the important people in the patient's life, and the web of relationships within the family.)

Read the patient's notes for

Diagnostic information

- Test results
- Understanding of the patient's clinical history
- The support system for the individual
- Background knowledge of the patient's life - making basic mistakes will undermine the patient's confidence)
- Understanding of spoken language, e.g. English. If not, arrange for an interpreter to be present

Discuss with other members of the team, and then select the most appropriate team member to break the bad news. Decide which other member of the team should be present during the interview. Ensure there is an interpreter or advocate present for those with special needs or language difficulties.

Check that you have

- A place of privacy where there will be no interruptions. Unplug the telephone and switch off the mobile phone etc.
- Tissues, a jug of water, and drinking glasses
- Time to carry out the process
- Your own emotional energy to do so - this job is better done earlier in the day than late
- Pressing tasks are completed so that there will be minimal interruptions

Plan

Prepare a rough plan in your mind of what you want to achieve in the communication, and what you want to avoid communicating. Having a rough goal will bring structure to the communication, though it is important to avoid imposing your agenda on the patient's agenda.

Setting the context

- Invite the patient to the place of privacy
- Introduce yourself clearly

- Let the patient know that they have your attention and how long you have got
- Ensure that the patient is comfortable and not distracted by pain or a full bladder etc.
- Give a “warning shot” indication that this is not a social or routine encounter
- Sit at the same eye level as each other within easy reach

A warning shot is concerned with preparing a patient that bad news is coming. This allows them to be more receptive than if it comes “out of the blue”. An example would be, “I’m sorry to say that the results were not as good as we had hoped.”

Assess

- How much the patient knows already
- How much the patient wants to know
- How the patient expresses him/herself and what words and ways he/she uses to understand the situation.

Acquire empathy with the patient

- What would it be like to be the patient?
- How is the patient feeling?
- Is there anything that is concerning the patient which he or she is not verbalizing?
- What mechanisms has the patient used in the past to deal with bad news?
- Does the patient have a particular outlook on life or cultural understanding which underpins his or her approach to dealing with the situation?
- Who are the important people in the patient's life?

Respond to non-verbal as well as verbal clues

Encourage the patient to speak by listening carefully and responding appropriately.

Sharing information

- Having spent time listening, use the patient's words to recap the story of the journey so far, checking regularly with the patient that you have heard the story correctly.
- Slowly and gradually draw out the information from the patient while regularly checking that they are not misunderstanding what you are saying.
- Use the “warning shot” technique to preface bad news to help the patient prepare them self.
- Use diagrams to help understanding and retention of information if appropriate and acceptable to the patient
- Avoid jargon and acronyms which are easily misunderstood.
- Do not bluff. It is acceptable to say “I do not know, and I will try to get an answer for you for our next meeting.”

Remember to ensure that

- The patient understands the implications of what you are saying
- The patient is in control of the speed at which information is being imparted
- The patient can see that you are being empathic to their emotional response
- You address the patient's real concerns, which may be very different from what you expect them to be
- You offer a record of the consultation, for example a tape recording or short written notes if appropriate

Response

- You should respond to the patient's feelings and response to the news
- You should acknowledge the patient's feelings
- You should be prepared to work through the patient's emotional response to the bad news with them

Let the patient speak first

Use open questions, such as:-

- How are you feeling today?

Make concrete plans for the next step

“Your next appointment would be next Thursday at 2 o'clock. How would that fit in with your other arrangements?”

Immediate plans

“How are you getting home?” “Who will you tell?” Such questions can help the patient to start formulating the answers that they will need for their family or friends.

Summarize

For the patient

- Ensure that the patient has understood

For other healthcare professionals

- Record details of the conversation in the patient's notes clearly
- Convey information quickly to those who need to know, most importantly the GP

Deal with questions

Contact for the future

- Closing remarks should identify support networks, including contact telephone numbers and times of easy access. Be fairly concrete about the next meeting but also allow the patient the option to postpone if they do not feel able to attend.

Cancer Pain Management

(Dr. Pooja Sethi, Senior Resident, Department of Radiotherapy, RCC, JIPMER)

Incidence of pain at cancer disease trajectory is approximately 20%-50%. This increases to 80% in advanced stage. Most patients with advanced cancer experience two or more types of cancer related pain, related to different etiologies. Pain management is one of the most important issues confronted when treating patients with malignant disease. Since 1986, World Health Organization's three-step analgesic ladder has helped to greatly improve pain management in cancer patients.

Causes of pain

- Caused by cancer itself. Pain occurs due to: a) Extension into soft tissue, b) Visceral involvement, c) Bony involvement, d) Nerve compression and injury, e) Raising intracranial pressure
- Related to the cancer (e.g. muscle spasm, lymph edema, constipation, bedsores)
- Related to anticancer treatment (e.g. chronic post surgical scar pain, mucositis)
- Caused by a concurrent disorder (e.g. Spondylosis, Osteoarthritis)

Evaluation of pain

- Detailed history of pain (type and location)
- Evaluate severity of pain (using pain assessment tool as shown in figure)

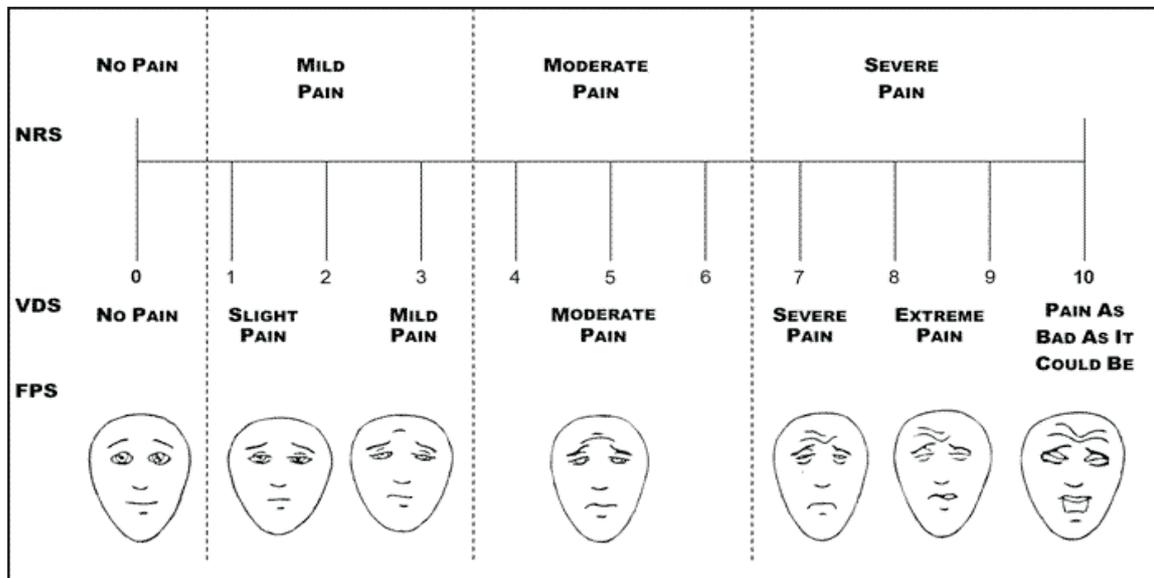
- Evaluate psychological state of the patient
- Physical examination
- Investigations

Classification of pain

- Nociceptive: Visceral, Somatic
- Neuropathic: Central, Peripheral

Approaches to cancer pain management

- Psychological approaches: Understanding, Companionship
- Modification of pathological process: Radiotherapy, Chemotherapy, Surgery, Hormone therapy
- Drugs: Analgesics, Antidepressants, Anticonvulsants, Anxiolytics, Neuroleptics
- Interruption of pain pathways: Local anesthetics, Neurolytic agents, Neurosurgery
- Modification of daily activities: Immobilization, Rest, Cervical collar or corset, Plastic splints or Slings



NRS- Numeric Rating Scale; VDS-Verbal Descriptor Scale; FPS- Faces Pain Scale

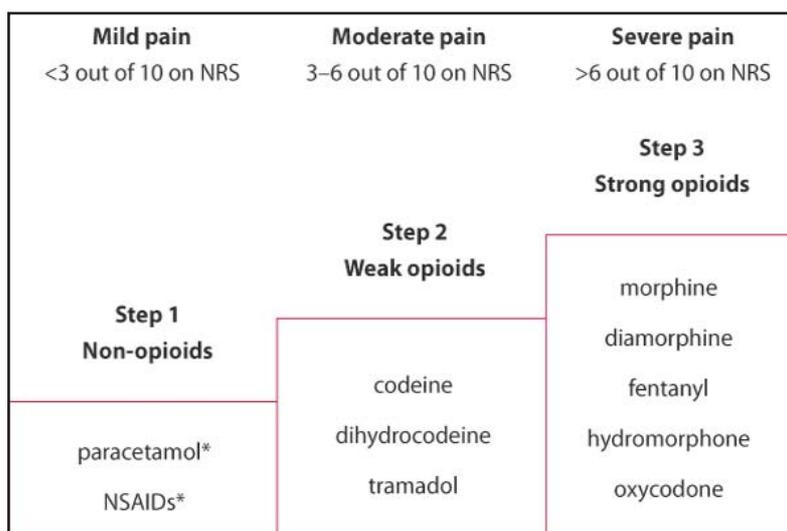
Analgesics:

- Non-opioids: Aspirin, Ibuprofen, Paracetamol
- Opioids: Morphine, Codeine, Tramadol, Pethidine, Buprenorphine
- Antidepressants: Amitriptyline, Imipramine
- Anticonvulsants: Carbamazepine, Valproate
- Corticosteroids: Prednisone, Dexamethasone

Principles for use of Analgesics

- By mouth
- By the clock
- By the ladder
- For the individual
- Attention to detail

Use of Analgesics : According to WHO Three step Ladder of cancer pain management



*NRS- Numeric Rating Scale

By Mouth

- Analgesics should be preferably given by mouth
- * Rectal suppositories are useful in dysphagia, uncontrolled vomiting or gastrointestinal obstruction
- * Transdermal patches offer an alternate route in these situations.

By the clock

- Give at fixed intervals
- Titrate against patient's pain
- Next dose should be given before the effect of previous one has fully worn off
- Consider rescue doses for breakthrough pain.

By the ladder

- Sequential use of drugs according to WHO guidelines (Three step Ladder)
- First step is a non-opioid
- Second Step- If this does not relieve pain, an opioid for mild to moderate pain should be added with nonopioid.
- Third Step- If this does not relieve pain, a strong opioid for moderate to severe pain should be substituted.
- Only one drug from each of the groups should be used at the same time
- Adjuvant drugs should be given for specific indications

For the Individual

- No standard doses for opioids
- Right dose is the one which relieves the pain with acceptable side effects

Attention to Detail

- Emphasize the need for regular administration
- Oral morphine should be administered q 4h
- The first and last doses of the day should be linked to the patient's waking time and bedtime (double dose at night time)
- Consider additional doses for breakthrough pain (5-15% of total 24 hr opioid dose)
- Drug regimen should clearly mention name of the drug(s), reason for use, dose and no. of times per day. Adjuvant drugs like antiemetics, laxatives should be prescribed for side effects associated with the use of opioids

Note: If patient does not achieve adequate analgesia with oral drugs or not able to tolerate opioids, several interventional strategies like regional infusion pumps (Epidural, Intrathecal, Regional Plexus) and neuroablative procedures can be used.

Radiation Safety for Nurses in Radiation Oncology

(Mr.K.Saravanan, Lecturer in Radiology (Medical Physics) – cum – RSO, RCC, JIPMER)

Nurses are the essential members of the multidisciplinary oncology team, with distinct roles and responsibilities. They are increasingly becoming integral part in radiological streams like Nuclear Medicine, Radiation Oncology, Cardiac-Catheterization Laboratory, Interventional Radiography, etc., in providing patient-care as well as assisting physicians during specialized procedures. It becomes essential for nurses to understand the biological effects of radiation and the safety aspects while working in areas using ionizing radiations for diagnostic and therapeutic purpose. This article is presented to create awareness about radiation safety and gives a brief outline on radiation safety for nurses working in Radiation Oncology.

Due to advancements in radiation technology and with the introduction of remote-controlled afterloading devices in Brachytherapy, radiation exposure to the treating physicians and nursing personnel have drastically come down. Brachytherapy is one of the modalities of radiotherapy where a radioactive sealed source – usually Cesium-137 or Cobalt-60 or Iridium-192 radioactive source – used in close proximity of the patient during treatment. Teletherapy is another modality where radioactive source or source of ionizing radiation is at a distance from the patient.

Following are radiation safety guidelines for nursing personnel that are to be followed by them while working in radiation oncology wards:

1) Know the location of the radioactive source in the

treatment room and try to maintain a reasonable distance from the source. The dose rate decreases based on the inverse square law. The dose at 2 meter from the source will be ¼ of the dose at 1 meter from the source.

- 2) Minimize the time spent in the Treatment Room as much as possible.
- 3) Use proper protective device and Personnel monitoring devices (TLD badges).
- 4) Check the radiation warning signals and zone monitor before entering the radiation zone.
- 5) Be familiar with the emergency procedures that are to be followed during radiation emergencies.
- 6) If a nursing staff becomes pregnant during her postings in radiation- related wards, the same has to be informed to the employr or Radiation Safety Officer (RSO) so that an alternate arrangement will be made based on the nature of her work.

International Commission of Radiological Protection (ICRP) offers its recommendations to regulatory and advisory agencies and provides advice intended to be of help to management and professional staff with responsibilities for radiological protection. The new dose limits recommended as per ICRP in its report 103 is given in table - 1 for reference. In India the Atomic Energy Regulatory Body (AERB) takes care of the radiation protection aspects within the country. More details are available in the web-sites like www.aerb.gov.in, www.iaea.org, www.icrp.org, www.aapm.org & www.aapm.org.

		Annual Dose Limit	
		Occupational	Public
Effective dose		20 mSv per year averaged over a defined period of 5 years, with not more than 50 mSv in any single year [@]	1 mSv per year.
Annual Equivalent Dose Individual Organs	Eye lens	150 mSv	15 mSv.
	Skin	500 mSv*	50 mSv.
	Hands & feet	500 mSv**	----
Equivalent dose Pregnant women		1 mSv to the embryo / fetus.	
Dose constraints for comforters and visitors of the patients		----	Adult 5 mSv. Child 1 mSv.

[@]- The limit prescribed by Atomic Energy Regulatory Board is 30 mSv in a year

* - Averaged over areas of no more than any 1 cm² regardless of the area exposed. The nominal depth is 7.0mg cm².

** - Averaged over areas of the skin not exceeding about 100 cm².

Extravasation Reactions - Nursing Perspective

(Dr. Ankit Jain, Assistant Professor, Dept. of Medical Oncology, JIPMER)

Extravasation injury is a well-known adverse event associated with intravenous chemotherapy administration and occurs when drugs escape from the veins or intravenous catheters into subcutaneous tissues. Accidental extravasation occurs in approximately 0.1 to 6% of patients receiving intravenous chemotherapy. Cancer patients are inherently at high risk of extravasation for several reasons. These patients often require multiple venipuncture sites and have thin and fragile veins, concomitant peripheral vascular disease, and malnutrition. In addition, the number of optimal intravenous sites may be reduced due to previous chemotherapy, cutaneous radiation therapy changes, and lymphedema secondary to surgery. The cutaneous manifestations of extravasation may range from discomfort and mild erythema to severely painful skin necrosis, ulcerations, and invasion and damage of deep tissue structures. Further necrotic complications, which may lead to significant morbidity, include damage to nerves and tendons, resulting in neurologic deficits, contractures, and joint stiffness. The extent of tissue damage in extravasation largely depends on the concentration, volume, and vesicant nature of the extravasated agent.

Extravasated cytotoxic agents generally cause two types of local cutaneous reactions: irritant and vesicant reactions.

Irritants cause a short-lived and self-limited phlebitis and tender, warm, erythematous reaction along the vein or at the site of intravenous administration. The reaction caused by vesicants is often referred to as chemical cellulitis, which initially presents in a similar way to irritation but may worsen, depending on the amount of drug that has extravasated. In contrast to small-volume extravasations, in which the erythema usually resolves over a few weeks, large-volume extravasations may induce necrosis within a matter of days. Eschars generally follow with subsequent development of painful ulcerations with red, raised edges. Antibiotics, such as doxorubicin, dactinomycin, daunorubicin, mitomycin, and vinca alkaloids like vincristine, vinblastine are probably the most common, potent, and well-documented vesicants. While almost all vesicants exhibit some degree of irritation on a spectrum of injury, carboplatin, cyclophosphamide, docetaxel, ifosfamide are known to produce irritation, but have not been reported to cause chemical cellulitis. If these agents do have vesicant activity, it is likely to be very minimal and rare.

Chemical cellulitis displays poor healing activity and often continues to worsen and progress, necessitating surgical intervention. As it has been estimated that about one-third of all vesicant extravasations will develop into ulcerations, vigilance in the proper and timely recognition and management of extravasation plays a major role in limiting tissue injury. When extravasation is suspected, prompt discontinuation of the infusion is recommended, followed by aspiration of residual drug and

removal of the catheter. Local cold application and elevation of the affected extremity is commonly used and helpful. Intermittent local cooling alone has an 89.1% success rate in preventing ulceration. For the vinca alkaloids, heat application is recommended instead, as cold application may actually induce ulceration.

Sodium thiosulfate and **hyaluronidase** have been recommended for mechlorethamine and vinca alkaloids, respectively. The success of locally injected corticosteroids has also been variable. Locally injected saline alone has proven successful in resolving extravasation reactions and preventing ulceration. While conservative treatment is preferable for most vesicant extravasations, early excision is sometimes favored, especially when the most potent vesicants are involved. Surgical consultation for wide local excision and flap reconstruction is invariably necessary when ulcerations become evident, or if extravasation lesions prove unresponsive to therapy. For topical therapy, the free-radical scavenger (**DMSO**) has shown consistent therapeutic success. In 1995, an analysis of 96 cumulative patients from multiple studies showed that DMSO protected 98.3% of extravasation cases from ulceration. Recently FDA has approved i.v. Dexrazoxane for anthracycline extravasations.

Prevention is always the most effective measure in managing extravasation and includes use of a central line or a carefully chosen site of administration. The use of a central venous catheter (CVC) or port is recommended for continuous infusion therapies. However, the use of CVC administration does not prevent extravasation injury, since devices may be dislodged, or venous vessels may be perforated with potentially disastrous consequences, including mediastinitis. Thus, central extravasation should be considered in the differential in the presentation of fever, severe pleuritic pain, upper extremity and neck swelling, and a widened mediastinum. In the case of peripheral intravenous administration, the selection of sites should be in the order of forearm, dorsal hand, wrist, and antecubital fossae, on the basis of the presence of vital underlying structures. Optimally, vesicants should not be given in areas of recent administration, irradiation, or lymphedema. It is also wise to avoid sites, which are distal to a recent site of venipuncture, as leakage could occur at these sites.

Suggested readings:

1. Guidelines for prevention and management of chemotherapy extravasation. NHS network 2009. (These guidelines explain the appropriate antidotes and their dosing for chemotherapy extravasation)

A Review of Emergencies in Oncology Practice

(Dr. Ashutosh Mukherji, Assistant Professor, Dept. of Radiation Oncology, RCC, JIPMER)

An Oncologic emergency is defined as any acute potentially life threatening event which if not anticipated quickly and not treated effectively may rapidly result in permanent morbidity or death of the patient. Oncological emergencies, their pathogenesis and treatment are briefly discussed in this article.

Superior vena cava obstruction

This was first reported by William Hunter in 1757. This disease presents with a wide range of clinical symptomatology and treatment. Caval obstruction may be an incidental finding on CT scan or may be the fulminant, initial presentation of a malignancy. SVCO may also be due to benign conditions like mediastinal fibrosis or thrombosis related to indwelling central catheters. Malignant causes of SVCO account for more than 90% of cases. Bronchogenic carcinomas, both small cell (SCLC) and non-small cell (NSCLC) are responsible for 65-80% of cases; while mediastinal tumors, particularly thymoma and thyroid cancer, account for 20% of malignant cases.

Pathogenesis and Clinical features: In SVCO extraluminal compression is due to either direct extension of a malignancy, classically a non-small cell lung cancer arising from the right upper lobe, leading to circumferential involvement of the cava and obstruction of venous return to the heart; or even from mediastinal lymphadenopathy. A final mechanism of SVC occlusion is that of intraluminal thrombosis. Characteristic SVCO syndrome involves facial and upper extremity edema, along with the development of tortuous collateral veins on the anterior chest wall. Headache, dizziness, and nausea may also be present. Rare signs include loss of consciousness from cerebral edema and airway compromise from epiglottic edema. Patients rarely present with acute symptoms but describe the gradual onset of symptoms over several weeks. Obstruction of the SVC below the insertion of the azygos vein leads to retrograde flow through azygos vein, into the inferior vena cava, and into the right atrium; while if obstruction is above the azygos vein, collateral venous beds like cervical and paravertebral plexuses dilate. These collateral vessels then drain into the azygos vein. The most severe cases of SVC syndrome occur when obstruction is at the level of the azygos vein. In these cases, small vessels overlying the thoracic wall dilate and serve to return venous blood to the inferior vena cava. Obstruction at the azygo-caval junction that occurs acutely may lead to severe symptoms and hence an evaluation of the azygos vein is critical.

Treatment and survival: include mainly Radiotherapy and chemotherapy, as well as endovascular stenting and medical decompression. Although patients rarely die as a direct consequence of SVCO, overall prognosis is poor, especially for those with lung cancer. Radiotherapy doses range from 10 Gy in 2-3 fractions to 20 Gy in 4-5 fractions. Patients with lung cancer have an overall 5-year survival of only 2%, compared with a 10% survival for those with breast cancer and a 40% survival for patients with lymphoma. Median survival is typically only 6 to 9 months following treatment.

Malignant spinal cord compression

Malignant spinal cord compression (MSCC) is an oncological emergency, with incidence second only to brain metastases for cancer emergencies in the central nervous system. Spinal cord compression from epidural metastases occurs in 5-10% of cancer patients, and in up to 40% of patients with

preexisting non spinal bone metastases. Symptoms depend on location of the compression and can involve the spinal cord at any level. If not rapidly diagnosed and treated, paralysis, incontinence, and severe chronic pain are the inevitable result. Pathogenesis: Compression of the spinal cord and nerve roots leads to epidural venous plexus compression resulting in cord edema and the secondary increase in inflammatory mediators like IL-1 & 6. This cascade of events, if left unchecked, will finally cause ischemia, neuronal death, and permanent neurologic injury. Anterior tumors can cause compression by growing posteriorly from the vertebral body into the epidural space, or by vertebral body collapse, causing tumor/bone retropulsion into the spinal canal. Lateral and posterior elements are less common. Paravertebral tumors can cause compression by entering the spinal canal through the intervertebral foramina.

Clinical features: Both local and distal symptoms and signs are seen. Lesions at the conus medullaris can produce symptoms like saddle anesthesia, acute urinary retention, incontinence of bowel and bladder, and impotence. Flaccid weakness, atrophy, fasciculations, and reduced deep tendon reflexes are seen in corresponding myotomes, with involvement of the anterior horn cells and the ventral roots (lower motor neuron lesions). A tumor involving the lateral cortico-spinal tracts can cause weakness, spasticity, hyperreflexia, and an extensor plantar response (Babinski's sign). Motor weakness and spasticity are seen with tumors above the conus medullaris. A lesion involving the lateral spino-thalamic tract will cause numbness, paresthesias, and decreased temperature sensation over the contra-lateral limb or trunk below the lesion; producing the classic finding of absence of perspiration or of temperature (cold) sensation. A lesion in the posterior column can cause gait ataxia seen by Romberg's sign. Paresthesias can occur below the level of the lesion. Cauda equina lesions cause radicular pain in the thigh, weakness, and atrophy of muscles. Saddle anesthesia, absent ankle reflexes, impotence, urinary urgency, or acute retention and constipation are also seen.

As pain and temperature pathways cross over in the spinal cord but proprioceptive and motor pathways do not, a unilateral spinal cord lesion can result in ipsilateral paralysis and proprioceptive loss, as well as contralateral pain-temperature loss below the level of the lesion. Because light touch travels in two pathways, one that crosses in the spinal cord (spinothalamic tract) and one that does not (posterior columns), it is usually spared in unilateral lesions. This combination of findings is known as the Brown-Sequard syndrome.

Bladder symptoms include hesitancy, dribbling, incontinence, urgency with incontinence, or acute retention. Loss of bladder control is seen early in the presentation of tumors in or below the conus and later in tumors above the conus. Cord lesions above L1 can lead to impotence or reflex priapism. Lesions involving S2-S4 may produce loss of erection and ejaculation ability. Decreased genital sensation can occur from lesions affecting the S2 nerve roots.

Pain from spinal canal tumors can be radicular, midline, or central. Radicular pain is secondary to involvement of the posterior roots and is characteristically described as shooting pain in a dermatomal distribution. Midline spinal pain causes discomfort localized to the area of the tumor and characteristically, the pain is more severe in extradural lesions.

Treatment: The most important modality for imaging of suspected MSCC is MRI of the entire spinal axis with gadolinium enhancement. Management can be Medical, Surgical or Radiotherapy. Medical decompression means treating with dexamethasone given at an initial dosage of 16mg divided into four daily doses, with subsequent taper over next few weeks. Surgical decompression is by either laminectomy with or without kyphoplasty for posterior situated tumours or vertebral body resection for anterior tumours. Palliative radiotherapy by single direct posterior field, AP-PA fields or lateral opposed fields (cervical spine); most commonly to a dose of 30 Gy in 10 fractions is useful in cases not amenable to surgery after starting medical treatment. Shorter therapy courses are also used and provide similar pain relief but have decreased long term recurrence free rates.

Brain metastases

The most common primary site is the lung followed by breast. MRI is the standard of care for imaging of the central nervous system (CNS) in cancer patients and frequently discloses smaller lesions not seen on CT scans, which can have a significant effect on the patient's prognosis and treatment course. Sudden increase in cerebral edema or hemorrhage into a metastatic lesion can lead to the patient presenting with sudden loss of consciousness or motor power, seizures, vomiting and headache and in certain acute situations may even be life threatening.

Treatment: Immediate treatment started with use of anticonvulsants (in cases of seizures) and medical decompression with a corticosteroid regimen of 10mg intravenous (IV) or oral bolus, followed by a 4 to 6 mg every 6 to 8 hours of dexamethasone (with a concurrent proton-pump inhibitor) before tapering in a cautious manner. In asymptomatic patients with little peritumoral edema or mass effect, initial corticosteroids may be reserved until the first sign of neurologic symptoms. The American Academy of Neurology recommends that prophylactic anticonvulsants not be initiated in newly diagnosed brain tumor patients who have not experienced a seizure as anticonvulsants are clearly known to impact negatively on quality of life and neuro-cognition post radiotherapy. After controlling the intra-cranial raised pressure due to edema, palliative treatment may be started, which may include radiotherapy or surgery.

Whole brain RT (WBRT) is the standard of care in patients with brain metastasis and should be given soon after the diagnosis of brain metastasis. There is no evidence to suggest that delaying systemic chemotherapy for WBRT compromises overall survival, especially when progression in the brain frequently leads directly to the death of the patient. A total dose of 30 Gy in 10 fractions is the standard for most patients. Shorter courses may be given (eg- 20 Gy in 5 fractions) in certain chemotherapy refractory progressive disease cases, but avoided in chemo-naïve cases as these patients will experience radiotherapy late toxicities if they have longer survival. Surgical resection should be reserved for lesions causing life-threatening complications or those patients with good performance status (i.e., KPS =70). Radiosurgery (SRS) can provide a substitute or alternative to conventional

surgery. Unless the tumor causes significant edema and mass effect, with consequent hydrocephalus or herniation requiring urgent surgical intervention, SRS can serve as a noninvasive alternative. Frequently, a patient may not be a craniotomy candidate because of tumor location in eloquent areas or existing medical contraindications.

Bone metastases

Metastatic disease to the bone is a common cause of pain and other significant symptoms that are detrimental to quality of life. The axial skeleton is the most common site of bone metastasis, with metastasis most frequently occurring in the spine, pelvis, and ribs. The lumbar spine is the single most frequent site of bone metastasis. In the appendicular skeleton, the proximal femurs are the most common site of metastatic disease, and humeral lesions also occur frequently.

Pathogenesis and clinical features: The most common symptom of bone metastases is slowly progressive, insidious pain that is fairly well localized, and which may be worse at night. The pain may radiate to other areas. This is most frequently seen with pain in the lower back, pelvis or hips that may radiate down the legs. Pain that radiates does not necessarily indicate nerve impingement because radicular pain can also be caused by spasm of muscles that originate or insert near the area of disease. Mechanisms of bone pain include mechanical instability, irritation of periosteal stretch receptors, tumor-directed osteoclast-mediated osteolysis, tumor cells themselves, or tumor-induced nerve injury, production of nerve growth factor or stimulation of other cytokine receptors.

Treatment: Emergency treatment in these cases is started in conditions of acute bone pain, impending or pathological fractures, and spinal cord compression by adjacent bone disease and may involve surgery and or radiotherapy. Surgical management of bone metastases is performed primarily to prevent or treat pathologic fractures. The goals are to prevent or relieve pain, improve motor function, and to improve overall quality of life. Treatment techniques are more effective when the procedure is performed prophylactically for an impending fracture rather than following the occurrence of a pathologic fracture. Various procedures include vertebroplasty, laminectomy, arthroplasty and hemiarthroplasty, internal fixation by plating or nailing. The use of bisphosphonates has shown to both decrease local pain as well as cause apoptosis of cancer cells. Radiation therapy also has been reported to be effective in palliating painful bone metastases, with partial pain relief seen in 80% to 90% of patients, and complete pain relief in 50% of patients. Multiple dose regimes like 30 Gy in 10 fractions, 15 Gy in 5 fractions, 20 Gy in 5 fractions, 25 Gy in 5 fractions and 8 Gy single fraction have been used. Results show there is a significant difference in response favoring the longer treatment courses: 40.5 Gy in 15 fractions for the solitary metastases and 30 Gy in 10 fractions for multiple metastases.

For patients with a poor performance status, difficulty making multiple trips for treatment, extensive non osseous metastases, and/or a short life expectancy, the most appropriate treatment is a single fraction of 8 Gy. For patients with a longer life expectancy, bone-only metastases, and good performance status, a longer course of treatment (30 Gy in 10 fractions) may be required to minimize the risk of retreatment.

Intestinal Obstruction/Perforation

Intestinal obstruction of acute onset or perforation are seen in 10–50% of patients with abdominal tumors, in 4–28% of gastrointestinal tumors and in 5–50% of gynecological tumors (mainly ovarian cancer) and need to be treated on emergent basis. These patients present in condition of hypovolemic shock with electrolyte imbalance and even septicemia. Initial treatment is directed towards stabilizing the patient with correction of fluid and electrolyte imbalance, IV antibiotics and even emergency colostomy. Definitive treatment requires surgical intervention.

Vaginal Bleeding or Pelvic Pain due to Gynecologic Malignancies

Bleeding from a lesion on the vulva, vagina, or cervix is usually due to venous ooze from the tumor. Pressure dressings or vaginal packing, with hospitalization and bed rest and starting irradiation, are successful in most clinically emergent conditions. But many retrospective studies have shown that vaginal bleeding from cervical or uterine cancer can be effectively palliated with 10 Gy whole pelvic irradiation given either once or repeated 1 month later. Reduction of bleeding occurs often within 24 to 48 hours of the first treatment. The first or second radiation treatment is usually delivered to the whole pelvis using anterior and posterior fields. A field reduction is used for the third fraction. A dose of 10 Gy whole pelvic radiation therapy is an effective means of palliating vaginal bleeding due to advanced or recurrent gynecologic cancer.

Acute bleed from Head and neck cancer or fungating neck node

In oropharyngeal and hypopharyngeal cancers, neck node involvement is seen in more than 40% cases, with a high proportion of cases presenting in advanced stage. Acute bleeding from the tongue/tonsillar fossa or pharyngeal mass can lead to aspiration and death. Torrential bleed from a fungating neck node can lead to acute hypovolemia with resultant circulatory collapse and death of patient.

Treatment involves stabilizing the patient and controlling the acute bleeding episode by pressure packing. Later after patient is stabilized, definitive treatment will involve either or both external carotid artery ligation and hemostatic radiotherapy. Radiotherapy can be delivered by direct enface field or parallel opposed portals to doses ranging from 5-8 Gy single fraction or 20 Gy in 4-5 fractions.

Tumor Lysis Syndrome

Tumor lysis syndrome (TLS) refers to the series of electrolyte abnormalities that occur following the rapid and immediate release of intracellular contents into the blood. This syndrome is characterized by hyperuricemia, hyperkalemia, hyperphosphatemia, and hypocalcemia. Metabolic acidosis and acute renal failure may also occur. The release of intracellular potassium and organic plus inorganic phosphate into the blood from cells undergoing apoptosis, results in the development of hyperkalemia and hyperphosphatemia. Prolonged and severe hyperphosphatemia leads to a marked decrease of the serum calcium concentration, but symptomatic hypocalcemia rarely develops. A rapid breakdown of nucleic acids leads to hyperuricemia. TLS usually occurs after the administration of high doses of chemotherapy, which results in the rapid destruction of tumor cells. Patients with acute myelogenous and lymphoblastic leukemias, especially those with high circulating blast counts and having large tumor burdens are at an increased risk for TLS, especially if the malignancy is sensitive to chemotherapy.

Signs and symptoms of tumor lysis syndrome include the following:

Hyperuricemia: nausea, vomiting, diarrhea, joint pain, oliguria, anuria, azotemia, flank pain, hematuria, crystalluria

Hyperkalemia: Muscle cramps, nausea, weakness, paresthesias, paralysis, EKG changes, bradyarrhythmias, tachyarrhythmias, cardiac arrest

Hyperphosphatemia: Oliguria, anuria, azotemia, renal failure

Hypocalcemia: Muscle twitching, tetany, laryngospasm, paresthesias, hypotension, ventricular arrhythmias, heart block.

Treatment of Acute Tumor Lysis Syndrome involves treating the various electrolyte imbalances:

Hyperuricemia

1. Increase IVF
2. Increase Allopurinol to 300–400mg/m²/day (Max 800 PO or 600 IV)
3. Consider acetazolamide
4. Rasburicase 0.15–0.2 mg/kg IV for 1 to 5 days

Hyperkalemia

1. Polystyrene sulfate
2. Calcium Gluconate
3. Aggressive diuresis
4. Dextrose + insulin
5. Sodium bicarbonate

Hyperphosphatemia

1. Phosphate binders
2. Decrease dietary intake

Hypocalcemia

1. Treat if Symptoms present
2. Calcium Gluconate only for Signs and symptoms

In case of Renal Failure: Renal consult and consider dialysis.

Hypercalcemia of malignancy

This is the single most common metabolic disorder in patients with cancer. Hypercalcemia caused by an underlying malignancy must be differentiated from hypercalcemia as a result of primary hyperparathyroidism and patients who present with cancer-related hypercalcemia often have signs and symptoms of the underlying malignant tumor including the recent onset of weight loss and this condition is associated with a shortened median survival. The most common constitutional symptoms include weight loss, anorexia, polydipsia, which may progress into nausea, vomiting, polyuria, azotemia, renal failure, constipation, ileus, abdominal pain. With continued rise, patients may begin to experience neurologic symptoms, like fatigue, lethargy, muscle weakness, confusion, seizure, and even coma. Cardiac symptoms are rare, but may even lead to fatal arrhythmias.

Treatment: Is directed at the underlying malignancy. Hypercalcemia mostly affects older patients, as well as patients with an underlying renal insufficiency, and those patients with advanced disease. Several supportive issues that can exacerbate hypercalcemia, such as immobilization, should be reviewed as well as the patient's medication list to avoid drugs that inhibit the usual calcium excretion, such as thiazide diuretics, nonsteroidal antiinflammatory agents, and histamine receptor antagonists. Bisphosphonates form the basis of treatment of cancer-related hypercalcemia and commonly used agents are Pamidronate and Zoledronate.

Febrile neutropenia

It is defined as a patient receiving chemotherapy and presenting with fever = 38°C orally or 38.3°C over 1 hour in presence of absolute neutrophil count of <500/mcL or a count of <1000/mcL and decreasing to <500/mcL over next 48 hours. These patients are at an increased risk of developing nosocomial infections.

Treatment: Isolating the patient in special rooms with positive pressure, and starting empirical antibiotics including a

cephalosporin + aminoglycoside combination. Work up includes blood, urine and body fluid cultures for bacterial, viral and fungal organisms, chest X-ray, CBC, BUN, electrolytes, pulse oximetry, urinalysis and LFTs. If patient is stable and responds, with cultures negative, conservative therapy is continued and counts monitored till normalization. If patient is unstable, with fever not responding or cultures positive; appropriate antibiotics are started along with G-CSF and daily monitoring of vitals and counts for 7-10 days. Anti-virals and anti-fungals added if patient

Cancer Awareness Calendar

S.N.	Date	The Day
1	March 11 th	Cancer Awareness day for Gynecological Cancers
2	May 31 st	WHO Anti-Tobacco day (Brown Ribbon Day)
3	June 19 th	Cancer Survivors Day (Yellow Ribbon Day)
4	September 12 th	Cancer Awareness Day for Head and Neck Cancers
5	September 14 th	International Lymphoma Day
6	October 10 th	Interanational Hospice Day / Palliative Care Day
7	October 22 nd	Cancer Awareness Day for Breast Cancer Patients (Pink Ribbon Day)
8	November 7 th	International Cancer Awareness day
9	December 1 st	International AIDS awareness Day for Reminder of HIV related cancers
Proposed Activities on other dates		
10	November 14 th	Awareness of Pediatric Cancers on BAL DIWAS related activities and programmes
11	International Mothers Day	Awareness of Mothers Protection from various cancers that include Gynec and Non gynec cancers such as Gall Bladder Post Cricoids, Esophagus etc.
12	First October International Elders Day	Awareness of increasingly prevalent Geriatric Oncology Problem in India society due to betterment of average age.

American Cancer Society Recommendations for the Early Detection of Cancer in Average-risk, Asymptomatic Individuals

CANCER SITE	POPULATION	TEST OR PROCEDURE	FREQUENCY
Breast	Women, aged 20+y	Breast self-examination (BSE)	Beginning in their early 20s, women should be told about the benefits and limitations of BSE. The importance of the prompt reporting of any new breast symptoms to a healthcare professional should be emphasized. Women who choose to do BSE should receive instructions and have their technique reviewed on the occasion of a periodic health examination.
		Clinical breast examination (CBE)	For women in their 20s and 30s, it is recommended that CBE be part of a periodic health examination, preferably at least every 3 y. Asymptomatic women aged 40+y should continue to undergo a CBE as part of a periodic health examination, preferably annually.
		Mammography	Begin annual mammography at age 40 y.*
Colorectal	Men and women, aged 50+y	Guaiac-based fecal occult blood test (gFOBT) [†] with greater than 50% test sensitivity for cancer, fecal immunochemical test (FIT) with greater than 50% test sensitivity for cancer, or	Annual, starting at age 50 y.
		Stool DNA test	Interval uncertain, starting at age 50 y.
		Flexible sigmoidoscopy (FSIG) or	Every 5 y, starting at age 50 y.
		gFOBT or FIT [†] and FSIG [‡] or	Annual FOBT (or FIT) and FSIG every 5 y, starting at age 50 y.
		Double-contrast barium enema or	Every 5 y, starting at age 50 y.
		Colonoscopy	Every 10 y, starting at age 50 y.
Computed tomography colonography	Every 5 y, starting at age 50 y.		
Cervix	Women, aged 18+y	Papanicolaou (Pap) test	Cervical cancer screening should begin approximately 3 y after a woman begins having vaginal intercourse, but no later than age 21 y. Screening should be performed every y with conventional Pap tests or every 2 y using liquid-based Pap tests. At or after age 30 y, women who have had 3 normal test results in a row may get screened every 2 to 3 y with cervical cytology (either conventional or liquid-based Pap test) alone, or every 3 y with a human papillomavirus DNA test plus cervical cytology. Women aged 70+y who have had 3 or more normal Pap tests and no abnormal Pap tests within the last 10 y and women who have undergone a total hysterectomy may choose to stop cervical cancer screening.
Endometrial	Women at menopause		At the time of menopause, women at average risk should be informed about the risks and symptoms of endometrial cancer and strongly encouraged to report any unexpected bleeding or spotting to their physicians.
Prostate	Men, aged 50+y	Digital rectal examination (DRE) and prostate-specific antigen test (PSA)	Health care providers should discuss the potential benefits and limitations of prostate cancer early detection testing with men and offer the PSA blood test and the digital rectal examination annually, beginning at age 50, to men who are at average risk of prostate cancer, and who have a life expectancy of at least 10 y.§
Cancer related checkup	Men and women, aged 20+y	On the occasion of a periodic health examination, the cancer-related checkup should include examination for cancers of the thyroid, testicles, ovaries, lymph nodes, oral cavity, and skin, as well as health counseling regarding tobacco use, sun exposure, diet and nutrition, risk factors, sexual practices, and environmental and occupational exposures.	

*Beginning at age 40 y, annual CBE should be performed prior to mammography.

[†]FOBT as it is sometimes performed in physicians' offices, with the single stool sample collected on a fingertip during a DRE, is not an adequate substitute for the recommended at-home procedure of collecting two samples from three consecutive specimens. Toilet bowl FOBT tests also are not recommended. In comparison with guaiac-based tests for the detection of occult blood, immunochemical tests are more patient-friendly, and are likely to be equal or better in sensitivity and specificity. There is no justification for repeating FOBT in response to an initial positive finding.

[‡]FSIG together with FOBT is preferred compared with FOBT or FSIG alone.

§Information should be provided to men regarding the benefits and limitations of testing so that an informed decision concerning testing can be made with the clinician's assistance.



CLINAC 600C Linear Accelerator (6 MV x-rays)



Cancer Screening Camp



Acuity iX Varian Simulator



Linear Accelerator (Teletherapy Unit)



Theratron 780 C (Teletherapy Unit)



microSelectron HDR (Brachytherapy Unit)



Regional Cancer Centre - OPD



Regional Cancer Centre - Day Care Centre



RCC Female Ward



RCC Nursing staff

