

P. D. HINDUJA HOSPITAL
& MEDICAL RESEARCH CENTRE

DEPARTMENT OF RADIATION ONCOLOGY



PATIENT INFORMATION BOOKLET



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WHAT IS RADIATION THERAPY?

Radiation therapy works by damaging the genetic material within cancer cells by delivering the radiation to the tumour area, shielding as much surrounding normal tissue as possible. When these damaged cancer cells die, the body naturally removes them. Normal cells are also affected by radiation, but they are able to repair themselves in a way that cancer cells cannot.

HOW DOES RADIATION THERAPY WORK?

- Eliminate tumours that have not spread to other parts of your body.
- Reduce the risk that cancer will return after you undergo surgery or chemotherapy by killing cancer cells that might remain.
- Shrink the tumour before surgery.
- Shrink tumours that are harming your quality of life, such as a lung tumour that is causing problems with breathing.
- Relieve pain by reducing the size of a tumour.

WHAT ARE THE DIFFERENT KINDS OF RADIATION?

Depending on the location, size and type of cancer, you may receive one or a combination of techniques. Your treatment team will help you decide which treatments are best for you. Radiation therapy can generally be delivered in three ways:

1. **External beam radiation therapy:** The treatment team uses a machine outside the body to direct radiation beams such as high-energy X-rays at the cancer.
2. **Brachytherapy:** This involves placing radioactive sources (for example, radioactive seeds) in or near the tumour.
3. **Systemic radiation therapy:** Radioactive drugs are given to the patient and travel through the bloodstream to treat cancer throughout the body.

1. EXTERNAL BEAM RADIATION THERAPY

During external beam radiation therapy, a beam (or multiple beams) of radiation generated by a machine called a linear accelerator, or linac is directed through the skin to the cancer and the immediate surrounding area to destroy the tumour and any nearby cancer cells. To minimize side effects, the treatments are typically given five days a week, Monday through Friday, for a number of weeks. This allows enough radiation to get into your body to kill the cancer while giving healthy cells time to recover.

A. 3 Dimensional Conformal Radiation Therapy (3-D CRT)

Three-dimensional conformal radiation therapy uses computers and special imaging techniques such as CT, MR or PET scans to show the size, shape and location of the tumour as well as surrounding organs.

B. Intensity Modulated Radiation Therapy (IMRT)

Intensity modulated radiation therapy is a specialized form of 3-D CRT that allows radiation to be broken up into many "beamlets," and the intensity of each beamlet can be adjusted individually. Using IMRT, it may be possible to further limit the amount of radiation received by healthy tissue and allow a higher dose of radiation to be delivered to the tumour.

C. Image Guided Radiation Therapy (IGRT)

Tumours can move between treatments, due to differences in organ filling or movements while breathing. IGRT allows for better targeting of cancer cells by use of CT, ultrasound, or X rays. You will first undergo a CT scan as part of the planning process.

The team compares these images with the images taken just before treatment to see if the treatment needs to be adjusted. In some cases, doctors will implant a tiny marker in or near the tumour to help localize the treatment area.

D. Stereotactic Radiation Therapy

Treatment outside the brain is called stereotactic body radiation therapy (SBRT). It is typically given in a few treatments. Often used for the lung, spine or liver, this involves using very secure immobilization of the head or body as well as using techniques that allow the radiation beam to account for organ motion during treatment.

2. BRACHYTHERAPY

Brachytherapy is the placement of radioactive sources in or just next to a tumour. During brachytherapy, the radioactive sources may be left in place permanently or only temporarily, depending upon your cancer.

There are two main forms of brachytherapy – intracavitary treatment and interstitial treatment.

With intracavitary treatment, the radioactive sources are put into a space near where the tumour is located, such as the cervix, the vagina or the windpipe.

With interstitial treatment, the radioactive sources are put directly into the tissues, such as the prostate.

WHO ARE THE MEMBERS OF THE RADIATION THERAPY TEAM?

A team of highly trained medical professionals will be involved in your care during radiation therapy.

Radiation oncologists are the doctors who oversee every step of the entire process, focusing on safe and effective treatment for every patient. Your radiation oncologist will also monitor your progress and adjust the treatment as necessary to make sure the radiation is hitting its target while minimizing side effects.

Medical Physicists will work with the team to develop an extensive safety and quality assurance plan to ensure that every patient receives the correct treatment in the safest possible way, each and every time.

Radiation Technologists work under the supervision of the radiation oncologist to expertly deliver treatments through the radiation therapy machines (linacs) using specialized protocols designed to enhance safety.

Radiation Oncology Nurses work with every member of the treatment team to care for you and your family before, during and after treatment. They assess how you are doing throughout treatment and help you cope with the changes you are experiencing.

WHAT ARE THE SIDE EFFECTS OF THIS THERAPY?

They are usually temporary, mild and treatable. These symptoms typically begin by the second or third week of treatment. They may last for a few weeks after the final radiation treatment and typically go away one month after completing radiation therapy.

The short-term side effect most often reported by patients receiving radiation therapy is fatigue. Fatigue may also be related to the area being treated and other therapies, such as chemotherapy, that the patient may be receiving. Patients may be able to continue all or a portion of their normal daily activities.

Long-term side effects of radiation therapy are uncommon and depend on the area receiving radiation as well as the dose being given. It is best to discuss the specific risks of long-term side effects with your radiation oncologist.

IS RADIATION THERAPY SAFE?

Radiation has been used successfully to treat patients for several years. With each advance, new quality checks have been developed to ensure safe treatment.

The benefits of radiation therapy outweigh any small risk that the treatment could cause a later cancer or other serious health conditions. The risk of developing a second tumour because of radiation therapy is extremely low.

Throughout your treatment, members of your team check and recheck your plan through repeat imaging and assess your progress and monitor any unexpected side effects that are occurring.

Your radiation oncologist will explain any special precautions that you or your family may need to take for a short time following treatment to ensure the safety of those around you.

HOW CAN PATIENTS BEST CARE FOR THEMSELVES DURING RADIATION THERAPY?

- You should get plenty of rest. Many patients experience fatigue during radiation therapy, so it is important to make sure you are well rested.
- Some physical activity during treatment like daily walks can help decrease fatigue.
- Eat a balanced, nutritious diet and stay hydrated.
- Treat skin exposed to radiation with extra care. The skin in the area receiving treatment may become red and sensitive, similar to sunburn. Some guidelines include:
 - *Clean the skin daily with warm water and a mild soap recommended by the team.*
 - *Avoid using any lotions, perfumes, deodorants or powders in the treatment area unless approved by the team. Avoid products containing alcohol, which may cause dryness.*
 - *Avoid putting anything hot or cold on the treated skin. This includes heating pads and ice packs.*
 - *Stay out of the sun. If you must be outdoors, you should wear a hat or clothing to protect the skin. After treatment, use sun screen with an SPF of at least 15.*
- Seek out support: There are many emotional demands on you and your care givers during the cancer diagnosis and treatment. It is common to feel anxious, depressed, afraid or hopeless. There are many groups that meet in person, over the phone or on the Internet. Some support organizations can even help manage financial issues, such as insurance and co-pays.
- Depending on the type of brachytherapy you receive, you may need to take some precautions after you leave your treatment, particularly if you plan to be around young children or pregnant women.

INSTRUCTIONS FOR PATIENTS WITH RADIATION TO PELVIC REGION (CARCINOMA CERVIX/ RECTUM/PROSTATE)

1. For treatment, we require you to have a nicely empty rectum (empty of gas and stool). Rectum should not be excessively filled or gassy during treatment.
2. Have light dinner and a good stool passage in morning prior to treatment.
3. Please inform the doctor, if you have constipation/ bloating/excessive gas; appropriate medicines will be given.
4. Avoid alcohol/smoking. Minimize following foodstuffs to decrease gas in bowel:
 - Cabbage, cauliflower, broccoli
 - Onions, peas, sweet potatoes
 - Chana dal, Besan
 - Beans
 - Dairy products
 - Soda/soft drinks/aerated drinks
 - Processed foods
5. Steps that can minimize swallowing air--
 - Eat slowly and chew food well.
 - Avoid talking a lot while you are eating.
 - Chew with your mouth closed.
 - Sip drinks rather than gulping.
 - Drink from a glass. Don't use a straw
 - Avoid chewing gum
 - Avoid fizzy drinks (e.g.. soft drinks)
 - Try not to drink large amounts of fluids with your meals.
 - Avoid very hot drinks, have them lukewarm instead. Air is swallowed when you sip on hot drinks.

Please note- Some of these above food stuffs are recommended to be minimized to avoid intestinal gas to ensure good treatment. You can continue to eat them after you finish radiation therapy.

PHYSIOTHERAPY CONSULTATION FOR PREVENTION

The following guidelines will help you to restore to normalcy earlier by improving flexibility, strength of concern joints and muscles after radiation or surgery:

1. Exercises after buccal mucosa surgery e.g. mandible, tongue, cheek -

- Lion mouth opening
- Move jaw to right and left side.
- Use jaw stretcher as taught by Therapist



2. Neck exercises -

- Turn head to right and left.
- Look up and down.
- Turn head to one side and then look up.
- Make circular movement with shoulder



3. Exercises following Breast surgery -

- Take both hands up towards ceiling
- Touch opposite shoulder from front
- Hold normal elbow from behind
- Clasp both hands, keep on your neck, now stretch elbows out.



4. Exercises to be done after any surgery -

- Upper chest deep breathing
- Keep hands on abdomen, take deep breaths
- Stretch hands sideways from front
- Pull your shoulders behind with elbows bent at 90 degrees.



5. Once the Lymphedema develops, the goal of therapy is to improve the flow of lymph from the arm. The treatment is a combination of following steps -

- Positioning of limb
- Active exercises
- Massage
- Compression sleeve
- Bandaging
(if moderate to severe Lymphedema)
- Pneumatic mechanical compression device



Tips to follow:

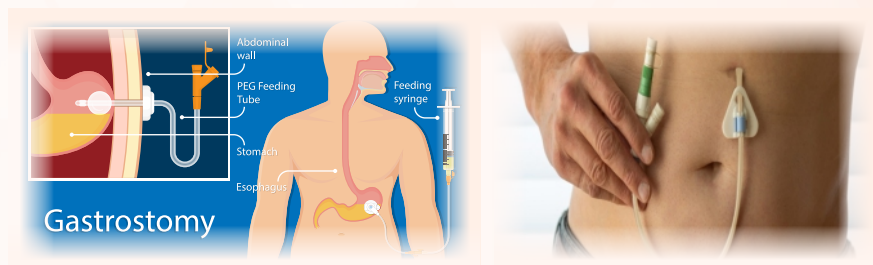
- Each exercises has to be done gently without fatigue
- Exercises within pain limit
- While exercising do not hold breath
- Exercises to be done twice a day
- Exercises to be learnt from trained therapist

Contact physiotherapy department for further details on 022-24447255.

PERCUTANEOUS ENDOSCOPIC GASTROSTOMY (PEG)

Percutaneous Endoscopic Gastrostomy (PEG) is a procedure in which a flexible feeding tube is placed through the abdominal wall into the stomach by endoscopy. PEG tube allows nutrition, fluids and/or medications to be put directly into the stomach, bypassing the mouth and oesophagus.

PEG administration of enteral feeds is one of the commonly used method of nutritional support for patients, who cannot eat or drink for various reasons.



Who needs a PEG tube?

Individuals with:

- Difficulty swallowing (dysphagia)
- Head and neck cancer with extensive mucositis limiting intake
- Stroke with inability to swallow

How long do PEG tubes last?

PEG tube can be removed once you commence oral intake. Generally, we advise the removal about one-two months post radiation. It may vary based on your recovery.

Can one eat and drink through the mouth with a PEG tube?

One can eat and drink through mouth after PEG placement. Often the mucositis precludes food intake and hence maximum intake is maintained through the tube.

Pre procedure investigation

- CBC
- PT/INR

Mouth Gargle 4 to 5 days before procedure with Chlorhexidine mouth wash or Betadine mouthwash.

This procedure is done by Gastroenterologist so, you will be required to meet gastroenterologist to discuss the procedure.

Provide medical history as well as medication allergies, depending on your health and underlying conditions, you may need to make medication adjustments.

Don't eat or drink at least eight hours before the procedure.

How is the PEG performed?

This is done as in inpatient (admission for 1-2 days). After overnight fasting, patient is given intravenous antibiotic and sedation pre-procedure. During the procedure, an endoscope (a flexible tube with camera lens at tip) is guided through mouth or nose into stomach. The light of endoscope is seen on abdominal wall; local anaesthetic is injected on abdominal wall. The PEG tube placed at a point which is close to abdominal wall. Procedure takes approximately 20 mins.

After the procedure, patient is shifted to ward and observed for a day.

Post peg

Day 1:

- After procedure Nil by tube and mouth for 6hrs
- All essential oral medicines can be given through PEG tube with little water starting 4 hours after procedure

Day 2:

- PEG feeds (as per dietician) from 7am, in propped up position. 8 feed 200ml each in a day. Explain to and encourage the care-taking relatives to learn PEG feeding.
- Flush tube with boiled (cooled) water (50ml) after every feed
- Stop feeds if patient vomits, and consult doctor immediately.
- Oral intake may be continued simultaneously if permitted by the physician.

Dressing:

- Daily dressing for 3 days after procedure with povidone iodine ointment
- After 3 days, alternate-day dressing for one week with povidone iodine Ointment
- After 1 week, daily cleaning with clean water; place fresh sterile gauze after drying wound
- Dressing to be taught to the relatives before discharge

ORAL HYGIENE

Before radiation, check with the doctor if you require dental treatment, especially patient receiving treatment to head and neck patient

If the sores are painful and unable to have food you can follow the following precaution:

- Eat foods cold or at room temperature. Hot and warm foods can irritate a tender mouth and throat.
- Choose soft, smoothing foods, such as ice cream, milkshakes, and baby food, soft boiled or scramble eggs, cottage cheese, custards, macaroni and cheese, pudding and jelly. Puree cooked foods, to make them smoother and easier to eat.
- Avoid irritating, acidic foods, such as tomatoes, citrus fruit and fruit juice (orange, grapefruit and lemon); spicy or salty foods; and rough, coarse, or dry foods such as raw vegetables, granola, and toast.
- Use a soft toothbrush
- Do not apply any after-shave lotion. Men who are allowed to
- Shave should use an electric shaver.
- Avoid exposure to strong sun. Wear a hat or a scarf if the head is treated.
- Rinse mouth after every meal (1 teaspoon soda bi-carb in a 500ml boiled, cold water.)

If mouth dryness bothers you or if there is problem for having food, try these tips:

- Drink plenty of liquids.
- Suck on ice chips or sugarless hard candy. Can also chew sugarless gum.
- Moisten dry foods with butter, margarine, gravy, sauces, curd or broth.
- Dip crisp, dry foods in mild liquids.
- Eat soft and pureed foods.
- Use white butter (Loni/Makkhan) if lips become dry.

DIETARY INSTRUCTIONS DURING RADIOTHERAPY

You need to have as healthy diet as possible during radiotherapy. Your body needs protein to heal itself and also plenty of energy (calories). Fluids and proteins should be incorporated in daily diet as they play important role during radiotherapy.

Fluids: It is important to drink plenty of fluids, about 2-2.5 litre per day. Keeping well hydrated helps the body to heal. Fluid include plain drinking water along with fluids/liquids e.g. Milk, buttermilk, lassi, lemon water, fresh fruit juices, sherbets, dal water, rice kanji, vegetable soups etc.

Protein: High protein food is important for body's requirement during therapy & for faster recovery, sources are as follows -

- Milk and milk products (Milk, curd, buttermilk, lassi, paneer etc.)
- Dal, Pulses, sprouts, soybean
- Nuts and Oilseeds
- Egg, chicken, fish etc.

If you don't have much appetite you can add extra energy and protein to your diet such as dry-fruits, nuts, milkshakes, kheer, pudding, ice creams or soups with cream etc. And you can add high protein powders (advised by your dietician) to your normal food to increase protein.

If you are having problems eating:

- Have small meal through the day rather than large meals ; eat little and often.
- Have soft/mashed/liquid diet if swallowing is difficult
- Avoid spicy foods if your mouth or throat are sore
- Tell the radiotherapy staff about any problems you have with eating or drinking – they can arrange for you to consult a dietician.

Kindly consult our dietitian on 022 2444 7231 / 9757330633 for further details.

Monday to Saturday

Teleconsultation: 9am-10am

Physical consultation: 1pm-3:45pm

EATING RELATED SIDE EFFECTS

Patient recovering from surgery, side effects of chemotherapy or fatigue and malaise following radiation therapy may experience loss of energy and weight. It may be worse for head and neck and oral cancers. There may be loss of taste and dryness of mouth and difficulty to have solid foods.

NOTE:

- Diabetic patients receiving radiation therapy to abdomen and pelvis to contact the doctor for further advice.

When you Feel Loss of Appetite:

- Eat small and frequent meals throughout the day. Keep snacks like raisins, dates, figs handy.
- Drink fluids like lime water, fruit juices, coconut water, vegetable juice, kanji, buttermilk, soup etc.
- You can add extra calories/energy to your diet by having calorie dense food such as dry-fruits, nuts, milkshakes, kheer, pudding, ice creams or soups with cream etc.
- Foods can be taken as soft food or can be a mashed food if swallowing is difficult.

A Changed Sense of Taste or Smell:

- To enhance the taste of the food you may add flavor enhancers such as lime, jeera powder, black pepper powder, tamarind, garlic, coriander, basil, mint etc.

Nausea and Vomiting:

- Prefer taking dry food items such as toasted bread, crackers, kurmura, biscuits, khakra etc. along with cold food such as custard, jelly, ice-cream, yogurt, lassi, chaas, lime water, fruit juices, coconut water etc.
- Avoid spicy food and eat a soft diet.

Diarrhoea:

- Drink plenty of fluid that retains body electrolytes (eg. potassium and sodium) such as sabudana (Sago) kanji, rice kanji, arrowroot kanji, ORS, coconut water etc.
- Easy to digest food such as khichadi, dal rice, curd rice, buttermilk, curd, boiled/mashed potatoes, apple, banana etc.
- Avoid food containing high fibre.

Constipation:

- Include more fibre in the diet like whole wheat or whole cereals, whole pulses, nuts, dried fruits, salads etc.
- Exercise as per your comfort level and drink hot water along with plenty of oral fluids.

PEG TUBE CARE AT HOME

Feeding:

- PEG feeds as per dietician
- Flush the tube with drinking water after every feed
- Keep in propped-up position during and after each feed. Stop feeds if patient vomits, and consult doctor immediately
- Oral intake may be continued simultaneously if permitted by the physician



- Pour liquid feed into syringe
- Hold the syringe higher than where the feeding tube goes in. Let the liquid feed run in slowly by gravity.
- Try not to let the syringe get empty before refilling it, as air will enter the stomach.
- Take at least 15 minutes to give a feed.

Report to hospital if severe pain at PEG site, or fever, or pus oozing from site.

LYMPHEDEMA PREVENTION AND TREATMENT

What is Lymphedema?

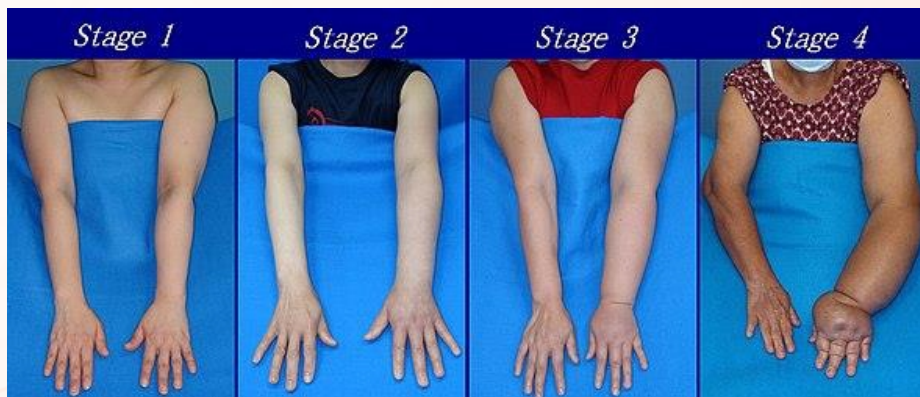
Swelling that generally occurs in one of your arms or legs. Sometimes both arms or both legs swell.

Lymphedema is most commonly caused by the removal of or damage to your lymph nodes as a part of cancer treatment. It results from a blockage in lymphatic system, which is part of immune system. The blockage prevents lymph fluid from draining well, and the fluid build up leads to swelling.

It is most troublesome long term side effect of mastectomy (removal of breast) when axillary dissection is done. It is associated with an increase in the girth or swelling of arm. Lymphedema can appear months or even years after successful treatment of cancer.

Classification of Lymphedema:

- Mild Lymphedema : When the increase in the girth of arm by 2cm to 4cm.
- Moderate Lymphedema : When the increase in the girth of arm by 4cm to 6cm.
- Severe Lymphedema : When the increase in the girth of arm by more than 6cm.



Prevention of Lymphedema:

- **Protect your arm or leg:** Avoid injury to your affected limb. Cuts, scrapes and burns can invite infection. Protect yourself from sharp objects. For example, shaving with an electric razor, wear gloves when you gardening or cooking, and use a thimble when you sewing. If possible, avoid medical procedures, such as blood drawing and vaccinations, in your affected limb. Avoid using glass bangles, tight ring on affected arm.
- **Rest your arm or leg while recovering:** After cancer treatment, exercise and stretching are encouraged. But avoid strenuous activity until you've recovered from surgery or radiation. Avoid lifting weight, sleeping on affected side. Do not over exert your affected hand.
- **Avoid heat on your arm or leg:** Don't apply ice or heat, such as with a heating pad, to your affected limb. Also, protect your affected limb from extreme cold. Use moisturizer (not coconut oil). To keep skin supple.
- **Elevate your arm or leg:** Whenever possible, elevate your affected limb above the level of your heart.
- **Avoid tight clothing:** Avoid anything that could constrict your arm or leg, such as tight fitting clothing and, in the case of your arm, blood pressure cuffs. Ask that your blood pressure to be taken in your other arm.
- **Keep your arm or leg clean:** Make skin and nail care high priorities. Inspect the skin on your arm or leg daily, watching for changes or breaks in your skin that could lead to infection. Don't go barefoot.

CANCER PREVENTION

1. Do not smoke. Do not use any form of tobacco
2. Make your home smoke free. Support smoke-free policies in your workplace
3. Take action to be a healthy body weight
4. Be physically active in everyday life. Limit the time you spend sitting
5. Have a healthy diet
6. Not drinking alcohol is better for cancer prevention
7. In The workplace, protect yourself against cancer- causing substances by following health and safety instructions
8. For women:
 - Breast feeding reduces the mother's cancer risk. If you can, breast-feed your baby
 - Hormone Replacement Therapy (HRT) increases the risk of certain cancers. Limit use of HRT
9. Take part in organized cancer screening programs for:
 - Bowel cancer (men and women)
 - Breast cancer (women)
 - Cervical cancer (women)

EMERGENCY CONTACT DETAILS

Radiation Oncology Department

Reception	022-2444 7025
Nursing Station	022-2444 7027 /8522
LA Console Room	022-2444 7029

Scheduling of Appointments

Jyothy Nambiar (Secretary)	022-2444 7018
For Appointments	022-6766 8181/4510 8181 (07:00am to 11:00pm)

Doctors

Dr. V. Kannan	022-2444 7003
Dr. Vivek Anand	022-2444 7020
Dr. Vinay Babu	022-2444 7009
Dr. Ritika Hinduja	72597 49641

Consultation

Physiotherapy	022-2444 7255
Oncology Dietitian	022-2444 7231
Dental	022-2444 7261

NOTES



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