



BUSAMED

HILLCREST PRIVATE HOSPITAL

ONCOLOGY CENTRE

For more information visit:

www.busamed.co.za

031 492 447 9471

varian

A PATIENT'S GUIDE

RADIATION TREATMENT FOR CANCER



CONTENTS

Introduction

How is radiation used to fight cancer?

Treatment techniques

Your clinical team's treatment process

FAQs


Glossary

INTRODUCTION

When you have been diagnosed with cancer, it is important to review with your healthcare team all available treatment options. One possible option for solid tumors is radiation treatment. You should always discuss all options for treating your cancer with your healthcare team, and whether radiation treatment is right for you.

This booklet will provide a general overview of the various techniques used in radiation oncology for both radiotherapy and radiosurgery treatments. Be sure to discuss any questions you may have about the information you read in this booklet with your healthcare team.

Radiation oncology teams use sophisticated software and highly specialized equipment to deliver a variety of treatments, depending on what is best for each patient's unique case. Your radiation oncologist will review the radiation treatment options with you and determine which one is right for your particular cancer.



HOW IS RADIATION USED TO FIGHT CANCER?

Radiation treatment uses focused X-rays, which are a form of energy, to destroy cancerous cells while minimizing the exposure of healthy tissue. Radiation damages the DNA in cancer cells, interrupting their ability to reproduce and causing them to die and the tumor to shrink. Most normal cells, however, have the ability to repair themselves and can more easily recover from radiation. If normal cells near the tumor area are exposed to radiation, it could lead to some side effects.

Side effects vary from patient to patient. Many side effects can be cumulative, which is to say they develop over the course of treatment as the radiation accumulates in the tumor. They can be minor or severe, depending on the size and location of the tumor and your general medical condition. Two of the most common side effects of radiation treatments are irritation or damage to the skin near the treatment site and fatigue. Serious side effects are treatment-site specific and can include diarrhea, nausea, swelling at the treatment site and lymphedema. Your treatment team will help you manage any side effects you may experience.

TREATMENT TECHNIQUES

There are two basic types of radiation treatment: radiotherapy and radiosurgery. With both techniques, the treatment delivery is non-invasive, so there are no incisions. These techniques focus a beam of radiation directly at the tumor while minimizing the exposure of surrounding healthy tissue.

The main differences between the two techniques are the number of treatment sessions and the strength of each dose of radiation. Radiotherapy usually involves having treatment sessions five days a week for four to six weeks, with each treatment session lasting about 10 to 30 minutes. Radiosurgery is delivered in five or fewer sessions over one or two weeks, with most treatment delivery taking from 30 minutes to 45 minutes. Also, the strength of each dose is much higher in radiosurgery, which makes it more appropriate for treating deep-seated tumors, smaller tumors, and cancers that have spread (metastasized) to multiple locations in the body.

Each of these two types of treatment can be designed and delivered in a variety of ways, depending on what's most appropriate for the patient. Here are the most common techniques:

3DCRT

Three-dimensional conformal radiotherapy (3DCRT) involves taking detailed digital images of a tumor and the surrounding normal structures (bones, organs, etc.) to deliver highly “conformed” (focused) radiation to match the shape of a tumor.

IMRT

Intensity-modulated radiotherapy (IMRT) allows doctors to adjust the intensity of a radiation beam so that the tumor receives a very high dose of radiation, while minimizing the exposure of normal tissue. Your clinical team uses three-dimensional scans of the target site to visualize the treatment “field” from many different angles. At each of these angles, the intensity of the radiation beam is modulated, and the shape of the beam is changed to match the shape of the tumor.

VMAT

Volumetric arc therapy (VMAT) is an advanced form of radiation treatment introduced by Varian Medical Systems, also called RapidArc® radiotherapy technology. RapidArc is a special kind of software that can be used with an advanced linear accelerator to deliver VMAT treatments quickly. With conventional VMAT treatments, a typical treatment can take anywhere from 15 minutes to 30 minutes. With RapidArc, most treatments can be delivered in less than 5 minutes.



SRS and SBRT

SRS, or stereotactic radiosurgery, is a type of radiosurgery that refers specifically to treatment of tumors or other abnormalities in the brain and spine. When radiosurgery technology is used to treat parts of the body outside the central nervous system, it is called stereotactic body radiotherapy (SBRT). SBRT is most often used to treat the prostate, lungs, pancreas, or kidneys. Because the intensity of each dose is much higher with radiosurgery, it is not appropriate for all cancer types. Your clinical team will determine the most appropriate way to treat your cancer.



YOUR CLINICAL TEAM

If radiotherapy or radiosurgery is right, for you, your treatment will be planned and delivered by a team of specialists that may include a radiation oncologist, medical physicist, and radiation therapist.

For radiosurgery treatments a radiation oncologist, neurosurgeon or other specialty surgeons may be involved.

(See the Glossary for descriptions)

Your team may be supported by other healthcare professionals such as a radiologist and other individuals who specialize in the area of the body being treated (e.g. A urologist for prostate cancer)

THE TREATMENT PROCESS

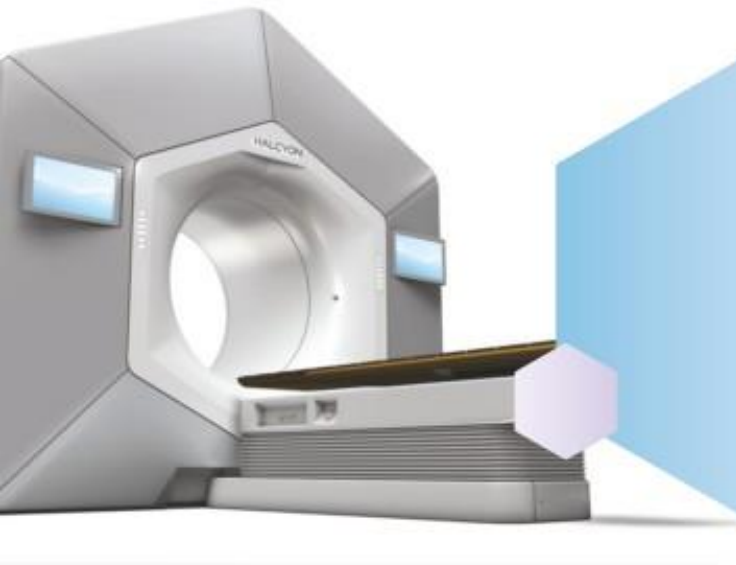
There are several steps to any radiotherapy or radiosurgery treatment. They consist of tumor visualization, treatment planning, treatment delivery, and follow-up. Again, your clinical team will determine which treatment technique is right for you, and will be able to answer any questions you may have before, during, or after treatment.

Tumor visualization

In order to design your treatment plan, your treatment team will take images to reveal the exact location of the tumor, including its size and position relative to the surrounding tissues and organs. This is typically done with a CT scan. Depending on the general location of the tumor and other factors, additional types of scans may be taken, such as an MRI, a PET scan, or an ultrasound scan. With the help of these scans or images, your clinical team can see details of the tumor from a variety of angles.

Depending on your treatment needs, a custom body mold (or a mask if your head is being treated) will be made, and tiny skin marks may be used to help ensure that you're in exactly the same position for each treatment session.





Planning

With the completed scans, your clinical team will use sophisticated treatment-planning software to develop a three-dimensional “picture” of the area where you will receive treatment. They’ll determine the amount of radiation to be delivered, the appropriate angles from which to deliver it, and the number of sessions needed to deliver the prescribed treatment. They’ll also take into account many other factors, including the type of cancer being treated, its location and size, your medical history, and your lab test results, to create a plan uniquely designed for you.

Treatment

Your cancer treatment will be delivered on a machine called a *linear accelerator*, or *linac* for short. This machine produces the X-rays used to treat cancer.

Before each treatment session, your radiation therapist (RT) will help position you

on the linac’s treatment table, or “couch.” Once you are positioned, the therapist may use the machine’s imaging system to take a new image of the tumor in that day’s treatment position to verify the correct target. Adjustments to your position may then be made so that it precisely matches the position that was planned for you.

The therapist will leave the room before your treatment begins. Your therapist will likely be in constant contact with you, using cameras and microphones set up in the treatment room. During the treatment, you will not see the radiation beam. As the machine delivers radiation beams from various angles, the multileaf collimator (MLC) continuously adjusts the beam to conform to the shape of the tumor, which helps deliver accurate treatment while minimizing radiation exposure to surrounding healthy tissue.

Follow-up care

After you complete your treatment, your radiation oncologist and healthcare team will monitor your progress with a series of follow-up visits. These visits can include a physical examination, a blood screening, additional imaging, and other tests that may be needed. Your follow-up appointments are also a good opportunity for you and your caregivers to ask any questions about your progress or inquire about the status of your overall health.

FAQs



Q: For which types of cancer is radiotherapy used? What can radiosurgery treat?

A: Radiotherapy is used to treat a variety of tumors, including cancers of the brain, breasts, cervix, larynx, lungs, pancreas, prostate, skin, spine, stomach, throat/neck, uterus, and soft-tissue sarcomas. Radiosurgery is generally used for tumors of the central nervous system, which include tumors of the brain and spine. Stereotactic body radiotherapy (SBRT) is most often used to treat other areas, including the prostate, lungs, liver, pancreas, or kidneys. Clinicians continue to research whether radiosurgery is appropriate for other types of cancer. Radiotherapy and radiosurgery are not right for all people or all tumors, and only your healthcare team can determine if it is right for you. It is important to discuss with your healthcare team all treatment options, including whether radiotherapy or radiosurgery is an appropriate option for you.

Q: Is radiation treatment used only to treat tumors?

A: No. In situations where it is not possible to completely eliminate the cancer, radiotherapy can be used to shrink the tumor, with the goal of reducing pain, pressure, and other symptoms in order to improve the patient's quality of life. When radiation is used in this way, it is called palliative radiation therapy.

Q: What are the side effects of radiation treatments?

A: Side effects vary from patient to patient. Many side effects can be cumulative, which is to say they develop over the course of treatment as the radiation accumulates in the tumor. They can be minor or severe, depending on the size and location of the tumor and your general medical condition. Two of the most common side effects of radiation treatments are irritation or damage to the skin near the treatment site,

and fatigue. Serious side effects are treatment-site specific and can include diarrhea, nausea, swelling at the treatment site, lymphedema, and secondary cancer. You can ask your team about which side effects you may expect during your specific treatment.

Q: Will I experience any pain during or after treatment?

A: You will not feel the radiation beam as it works, nor will you be able to see it. If you have trouble remaining still during treatment, you may, at times, feel discomfort. However, your clinical team will work with you to make you as comfortable as possible.

After treatment, side effects can be minor or severe, depending on the size and location of the tumor and your general medical condition. Two of the most common side effects of radiation treatments are irritation or damage to the skin near the treatment site, and fatigue. There may be pain in the mouth or pharynx with head and neck treatment. Serious side effects are treatment-site specific and can include diarrhea, nausea, swelling at the treatment site, lymphedema, and secondary cancer.

Q: How will radiotherapy or radiosurgery affect my daily routine?

A: Many patients are able to continue most of their usual activities during treatment, including work and mild exercise. However, your energy level may decrease toward the end of your treatment course. If so, you should allow yourself the extra rest you need. Fatigue typically subsides within weeks after treatment ends. Again, it is important that you consult with your doctor and healthcare team about the types of activities and exercise you may continue during your radiotherapy.

Q: Will I be able to drive after my radiation treatments?

A: Many patients are able to drive during their course of treatment and, in many cases, are able to continue normal daily activities, including work. You should, however, ask your doctor about your individual situation and the types of activities you can do during your treatment.

Q: Does radiation treatment cause hair loss?

A: Radiation treatment can cause temporary hair loss, but only in the area being treated. You should not lose your hair unless your treatment targets a part of the body that grows hair, such as your scalp. The amount of hair that grows back depends on the intensity of the radiation you receive.

Q: Will radiation treatment make me nauseous?

A: Generally, radiation treatment affects only those areas being treated, so if you are not receiving radiation to your abdomen, it is unlikely that you will experience nausea as a result of treatment. In some cases, a patient's nausea is caused by other aspects of his or her treatment, such as chemotherapy or pain medication.

Q: Will radiation treatments make me radioactive?

A: External-beam radiation treatment, where the source of the radiation is a machine outside your body, will not make you radioactive. After the radiation is delivered, there is no lingering radiation.

GLOSSARY

CT scan (Computed Tomography Scan)

A Series of detailed pictures of areas inside the body taken from different angles. The pictures are created by a computer linked to an X-ray machine.

Medical Physicist

An expert who works with the dosimetrist and the radiation oncologist to measure the precision of your treatment plan. The medical physicist also runs frequent safety checks and makes sure that the equipment is working properly.

MRI (Magnetic Resonance Imaging)

A procedure in which radio waves and a powerful magnet linked to a computer are used to create detailed pictures of areas inside the body. These pictures can show the difference between normal and diseased tissue. An MRI is especially useful for imaging the brain, the spine, the soft tissue of joints, and the insides of bones.

Neurosurgeon

A physician trained in surgery of the nervous system who specializes in surgery on the brain and other parts of the nervous system.

PET Scan (Positron Emission Tomography Scan)

A procedure in which a small amount of radioactive glucose (sugar) is injected into a vein, and a scanner is used to make detailed computerized pictures of areas inside the body where the glucose is used. Because cancer cells often use more glucose than normal cells, the pictures can be used to find cancer cells in the body.

Radiation Oncologist

A doctor who specializes in the treatment of cancer patients using radiation therapy as the main modality of treatment.

Radiation Therapist

A specially trained individual who operates the linear accelerator, which administers radiation treatments to patients.

