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Patient Guide

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What is Radiation Therapy?

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What is Radiation Therapy?

Radiation therapy, sometimes called radiotherapy, involves the use of high-energy X-rays, to treat cancer and other diseases. Radiation has been used to effectively fight cancer for over 100 years. At Minneapolis Radiation Oncology (MRO), radiation oncologists use radiation to cure cancer, to shrink or stop a tumor from growing, or to relieve pain.

Radiation is a localized treatment, that only targets the cells in the part of the body being treated. It's often used along with other cancer treatments, such as surgery, chemotherapy, or immunotherapy.

How does radiation therapy work?

At MRO, the doctor and care team direct radiation beams to the tumor inside your body to destroy or damage cancer cells, so they can no longer reproduce; this slows or stops tumor growth. Radiation therapy can be administered externally or internally based on the recommended treatment plan created for you, dependent on your cancer type, location, and stage. Your doctor will discuss your treatment options and answer your questions in depth before you begin any treatment.

Most cancer patients have *external beam radiation therapy* delivered from a state-of-the-art machine called a linear accelerator (LINAC). With the continued introduction of advanced imaging and sculpting tools we can use the LINAC to precisely target a tumor with three-dimensional accuracy that shapes and directs the beams with precision. This results in the ability to treat with fewer potential side effects.

What are the benefits and risks of radiation therapy?

Benefits

Radiation is an effective way to treat many different types of cancer, in almost any part of the body. At least half of all people who are treated for cancer receive radiation therapy and the number of patients cured rises every day.

Even when a cure is not possible, radiation therapy may bring relief. Many patients can enjoy a better quality of life when radiation is used to shrink tumors and reduce pressure, bleeding, pain, or other symptoms.

Risks

Like many other treatments for disease, there are risks involved with radiation therapy. The brief doses of radiation that destroy cancer cells can also damage normal cells. When this happens, you may experience side effects, but generally, the risk of side effects is outweighed by the benefits of killing cancer cells. Your MRO care team will not recommend radiation treatment unless the potential benefits are greater than the known risks.

Every person reacts to radiation therapy differently. It's best to consider that side effects are possible, though you may not experience any of them. Your MRO care team can help you determine how to prevent or manage side effects.

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Treating your cancer with radiation therapy

A cancer diagnosis is life changing. As specialists in treating cancer with advanced radiation technology, we understand that the more you know about your treatment options, the better you can make informed decisions and get back to living your life.

The care teams at MRO provide the highest standards of care, using the most advanced radiation technology available. We provide multiple modalities of therapy: **external and internal treatments for cancer,** as well as therapies for other noncancerous conditions.

External beam radiation therapy (Conventional) is the most common method for delivering radiation therapy. Typically, external beam radiation uses small dosages of radiation, given 5 days a week over 1 to 8 weeks with breaks on the weekends. Patients who receive external radiation treatment are not radioactive during or after treatment.

External beam radiation therapy is delivered from a machine called a **linear accelerator (LINAC).** In the 1950's, the LINAC revolutionized the way radiation was delivered to treat cancer. Now, we can use the LINAC to precisely target, sculpt, and conform radiation beams with these state-of-the-art tools:

MLC

Multi-Leaf Collimators (MLC) use leaves to automatically sculpt radiation beams to conform to the shape of a tumor from several different angles, allowing us to deliver a prescribed dose across all the dimensions of the tumor.

IMRT

Intensity-modulated radiation therapy (IMRT) is an advanced form of three-dimensional radiation therapy. It allows our MRO care team to aim precisely shaped beams from the linear accelerator at the tumor from several directions and adjust the intensity of the beams.

IMRT radiation may also be delivered with a continuous arc of radiation that is constantly being shaped to conform to the target and your anatomy. This is often called RapidArc or VMAT (Volumetric Arc Therapy). Another advantage of arc-based technology is that your treatment time is much shorter.

IGRT

Image-guided radiation therapy (IGRT) involves daily imaging immediately before and/or during a treatment to verify the precise positioning of the target and radiation beams. Because tumors can move slightly from day to day, or even moment to moment during a treatment (such as a lung treatment when you breathe), we use IGRT to make precise adjustments. This enables us to optimize your daily treatment and minimize the dose to nearby normal tissues.

In addition to IGRT, MRO therapy centers are equipped with other techniques to ensure precise localization. For example, in certain cases, we can directly monitor the external contour of a patient's body, to ensure precise positioning and account for motion during breathing. These techniques are important during breast cancer treatment, helping to not expose the heart to radiation.

LINAC Machine

RapidArc

MLC

Stereotactic Radiotherapy is a specialized type of external beam radiation therapy that uses highly focused megavoltage x-ray beams to shrink or control the growth of a tumor or abnormal cells by either killing the cells directly, or by disrupting the ability of the cells to grow. Stereotactic radiation therapy is a highly conformal treatment that delivers a very high dose of radiation in only a few treatments. The treatment(s) are delivered in 1-5 fractions over the course of 1-2 weeks.

For stereotactic radiation therapy, it is extremely important to use an immobilizing system that will allow patients to be accurately repositioned to match their position on the day of CT-based planning.

Your MRO care team may use stereotactic radiotherapy because of a tumor's location, because of a high risk of side effects with other treatments, because a patient is not healthy enough for other treatments, or because a tumor continues to grow despite other treatment. Your MRO care team can tell you if this is an option for your specific condition.

There are two types of stereotactic radiation:

1. **Stereotactic body radiation therapy (SBRT),** sometimes called stereotactic ablative radiotherapy (SABR), delivers precisely focused - down to the millimeter - radiation in typically three to five treatments to tumors within the body.
2. **Stereotactic radiosurgery (SRS)** typically delivers one stereotactic radiation treatment to the brain. SRS is delivered by a team involving a radiation oncologist and neurosurgeon. This treatment does not involve surgery. An incision is not made, and tissue is not surgically removed. You'll be fitted with a mask system worn during preparation and treatments to keep your head in the same precise position.

Stereotactic Radiation (SRS/SBRT/SABR) is generally best for very small tumors. The doctors at MRO use specialized scans to pinpoint the exact tumor location and adjust for patient motion, such as breathing. A customized holder or mask may be used to keep the body perfectly still during treatment. Some patients with more than one target area could have treatments using a combination of SRS, SBRT/SABR, and conventional radiation therapy.

HyperArc™ Technology is an automated treatment delivery paradigm, which aims radiation at tumors from a variety of beam angles. HyperArc allows the specialists at MRO to irradiate multiple brain tumors at the same time without the need to reposition the patient. This new technology is designed to help treat patients with multiple brain metastases significantly faster and more efficiently.

Internal Radiation Therapy—Brachytherapy

Internal radiation, or *brachytherapy* may be recommended for certain types of cancer, such as prostate cancer or cervical cancer. In fact, MRO pioneered this type of treatment for prostate cancer in 1988.

With brachytherapy, a radioactive implant is put inside the body in or near the tumor. This way the radiation affects as few normal cells as possible. Getting the implant placed is usually done in a hospital. Depending on your type of cancer and treatment plan, you might get a temporary or a permanent implant.

1. Low-dose-rate brachytherapy (LDR) which is often administered for prostate cancer – uses an implant that gives off lower doses of radiation over a longer period. Implants may be left in place for a day or so, but some smaller implants are left in place and never taken out. They're about the size of a grain of rice and rarely cause problems and after several weeks, they stop giving off radiation. If your implants are to be left in, you may be able to go home the same day they're put in. Your body may give off a small amount of radiation for a short time, and your MRO care team may recommend you take some special precautions after treatment.

Prostate Brachytherapy

Minneapolis Radiation Oncology physicians pioneered the use of brachytherapy for prostate cancer in the upper Midwest. The first treatment in the region was performed by MRO radiation oncologist Dr. Doug Olson in 1988.

Prostate brachytherapy is performed in a specially equipped operating room by a radiation oncologist and a urologist while a patient is asleep or under anesthesia. Working closely together, the team uses ultrasound guidance to place long thin metal tubes into the prostate, through which 70 to 120 tiny radioactive seeds are implanted. The seeds are about the thickness of a pencil lead and just about an 1/8 inch long. The procedure typically takes one hour, and the patient is usually discharged later that day.

Although the internal seeds emit low-energy radiation with only trace amounts of radiation outside the patient's body, the specialists at MRO recommend patients avoid close contact with children and pregnant women for a short time following the seed placement. After approximately 6 months, the seed will be essentially inactive. They can be safely left in place indefinitely.

2. High-dose-rate brachytherapy (HDR) treats patients for several minutes at a time with a powerful radioactive source that's put in an applicator. The source is removed after 10 to 20 minutes. You may be treated twice a day over a few days, or once a day over the course of a few weeks. The radioactive material itself is not left in your body, but the applicator might be left in place between treatments, or it might be put in before each treatment. The radioactive source is removed from your body after HDR brachytherapy, and you are not radioactive after treatment.

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FAQ's for Radiation Therapy and You

We have compiled the following list of questions frequently asked by our patients and their families. If your question is not answered here, please feel free to contact us at any of our MRO locations.

What is radiation therapy?

Radiation therapy is MRO's clinical specialty which utilizes very high energy X-rays, gamma rays, electron beams, or other ionizing radiation to manage and treat many types of malignancies (and occasionally some non-malignant conditions). Radiation can be administered externally or internally. You and your radiation oncologist will discuss which type is the best choice for you.

Radiation works by "ionizing" or breaking apart atoms that make up parts of the cells in the treatment area. Cells exposed to radiation are injured and become unable to reproduce, but healthy cells recover more quickly than malignant cells. The goal of radiation therapy is to give enough radiation to compromise the cancer cells, while leaving adequate healthy cells to repopulate and heal the exposed area.

Does radiation therapy hurt?

Receiving external radiation treatments does not hurt. It is like having an X-ray. However, you will be required to lie very still and in the same position for each treatment. This is so your radiation therapist can accurately pinpoint your treatment area each time you come in.

If internal radiation therapy is recommended, there may be some discomfort when the radioactive sources are being placed. Patients are often sedated or anesthetized during this procedure. This will be determined by your radiation oncologist and by the type of procedure being performed.

During my external radiation treatment session, will I hear, see, or feel anything?

You will not feel anything during the radiation treatment. Radiation is not visible to the human eye.You will, however, hear the treatment machine make a buzzing sound while the treatment is being delivered. The machine sometimes moves during the treatment and you will hear that also.

Will I become radioactive?

External radiation therapy does not cause your body to become radioactive. You may safely be around other people, even pregnant women, babies, and young children.

Will I go bald?

Hair loss is restricted to the treated area. In other words, radiation to the pelvis or abdomen will not cause you to lose hair on your head. However, if you are receiving chemotherapy along with radiation, you may lose all body hair, including the hair on your head. Not all chemotherapy drugs cause hair loss. In most cases, hair will grow back within a few months after all therapy ends.

Will I feel tired?

Yes, you will likely feel tired, especially after approximately your third week of treatment, and tiredness generally lasts until about 3 to 6 weeks after you finish your radiation therapy.

What percentage of cancer patients receive radiation therapy?

Approximately 50% of cancer patients receive radiation therapy. Radiation therapy may be prescribed as the only treatment for the patient, or it may be prescribed in combination with surgery and/or chemotherapy.

Is radiation treatment expensive?

Treatment of cancer with radiation can be costly. It requires very complex equipment and the services of many health care professionals. The exact cost of your radiation therapy will depend on the type and number of treatments you need. Most health insurance policies, including Part B of Medicare, cover charges for radiation therapy. It is a good idea to talk with your doctor's office staff or the Minneapolis Radiation Oncology business office about your policy and how expected costs will be paid. In some states, the Medicaid program may help you pay for treatments. You can find out from the office that handles social services in your city or county whether you are eligible for Medicaid and whether your radiation therapy is a covered expense.

How long does a typical treatment take?

Each external beam radiation treatment session lasts about 5 to 30 minutes. Most of that time is spent in preparation. The actual treatment only lasts 1 to 20 minutes.

What are some of the cancers treated by radiation therapy?

Breast, prostate, lung, skin, brain, throat, rectal, stomach, esophageal, bladder, and bone, among others.

What can I expect regarding side effects?

Side effects of radiation therapy are often related to treatment dose and the area that is being treated. Most side effects, although sometimes unpleasant, are not serious and can be controlled with medications or diet. The most common side effects are fatigue, skin changes, and loss of appetite.

Can radiation cause cancer?

In some instances, overexposure to radiation can cause cancer. However, the therapeutic radiation you will be receiving uses very limited and targeted amounts of radiation, and the risk of the treatment causing a new cancer in the future is very rare.

Can I continue to work during radiation therapy?

Some people are able to work full-time during radiation therapy and others can only work part-time or not at all. How much you are able to work depends on how you feel. Ask your MRO care team about what you may expect from the treatment you will have.

Should I follow a special diet while I am getting radiation therapy?

Your body uses a lot of energy to heal during radiation therapy. It is important that you eat enough calories and protein to keep your weight the same during this time. Ask your MRO care team if they recommend a special diet while you are receiving radiation therapy. You may also find it helpful to speak with a dietician.

Learn more by reviewing the National Cancer Institute 'Radiation Therapy and You' brochure.

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Meet your MRO care team

At Minneapolis Radiation Oncology, you'll have a team of specialists from various disciplines who are focused on your unique needs, and will work together to plan and deliver custom-designed treatments. We also have many resources available to help you with any questions you may have on billing, transportation, nutrition and more.

Radiation Oncologists

Your MRO radiation oncologist will be a specialist in using radiation to treat cancer. He or she will work with your other physicians to determine the most effective way to treat your cancer, and will custom design a treatment plan to meet your needs.

Radiation Oncology Nurses

MRO's radiation oncology nurses are specifically trained to manage your care. They'll work closely with your radiation oncologist throughout your treatment, and can answer any questions and concerns you or your family may have. Your nurse will assist you with your medications, any necessary referrals, and side effects from treatment.

Medical Physicists

MRO radiation physicists monitor the advanced equipment in our treatment centers to ensure that the proper amount of radiation is being produced and delivered safely and accurately.

Medical Dosimetrists

MRO's medical dosimetrists will help plan your treatment. He or she will assist your physician in calculating radiation dosages based on your radiation oncologist's prescription and overall treatment goals.

Radiation Therapists

MRO's radiation therapists are specially trained to run our advanced equipment and ensure you receive the precise treatment prescribed by your radiation oncologist. When you enter the treatment area, your therapist will properly align the area of your treatment with the radiation beams, and will be in continuous communication with you during treatment.

Medical Secretaries

An MRO medical secretary will greet you at the reception desk and assist you in scheduling appointments, gathering information, and maintaining your records.

Other Personnel

MRO Radiation Therapy Centers actively participate in training students for careers in radiation oncology. Under the supervision of MRO staff, you may see individuals receiving clinical training in medical physics, dosimetry, and radiation therapy technology.

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Ask your doctor about Minneapolis Radiation Oncology

Not all patients experience side effects from radiation therapy. However, your radiation oncologist will carefully go over any side effects you could expect, how long they will last, how serious they might be, and how best to relieve symptoms.

Some side effects become apparent during the course of treatment. Others, because of the cumulative nature of radiation, may not appear until after treatments have finished.

Typical side effects during treatment include fatigue and skin changes in the treatment area. These can result from radiation to any treatment site. Other side effects are related to treatment of specific areas. For example, hair loss may be a side effect of radiation treatment to the head. Side effects tend to go away with time.

You should inform your MRO care team if you are experiencing side effects. They can help you treat the problems and reduce the chance of them reoccurring.

Are side effects the same for everyone?

Side effects vary person by person. You may have none, a few mild ones, or more serious side effects depending on your treatment dose and which part of the body is being treated. Your general health also can affect how your body reacts to radiation therapy. Side effects are typically greater if chemotherapy is used at the same time as radiotherapy.

There are two main types of side effects: acute and chronic. Acute, or short-term, side effects occur close to the time of the treatment and usually are gone within a few weeks of finishing therapy. Chronic, or long-term, side effects may take months or years to develop and are sometimes permanent. Treatment is planned so that the risk of these long-term side effects is minimal.

Most side effects go away with time. Your MRO care team can give you ideas for treating or reducing the discomfort of side effects. If you experience a particularly severe side effect, your doctor may prescribe a break in your treatments or change the kind of treatment you are receiving.

Will side effects limit my activity?

Not necessarily. Most patients are able to go to work, take care of their daily needs, and enjoy leisure activities while they are receiving radiation therapy. Others find they need more rest than usual. We encourage you to try to do things you enjoy as long as you do not become too tired.

If you work a full-time job, you may want to continue. You can ask your MRO care team to schedule your treatments around your workday. However, treatment visits can be time consuming. While receiving treatment, you may decide to take a few weeks off work, or work a reduced schedule. MRO will happily provide any necessary paperwork to facilitate this. We encourage you to speak frankly with your employer about your care and your needs. You may be able to do some work at home. If your job requires lifting or heavy physical activity, you may need to change your activities until you have regained your strength. Also, if you currently exercise regularly, continue to do so but respect your body's limitations. Most exercise routines may be continued with slight changes. Yoga is good for maintaining strength and flexibility while reducing stress.

Whether you are working or not, it is a good idea to ask family members or friends to help with daily chores, shopping, childcare, housework or driving. Neighbors can help by picking up groceries for you when they do their own shopping. To conserve your energy, you could ask someone to drive you to and from your treatment visits.

Your MRO care team may suggest you limit activities that might irritate the area being treated. In most cases, you can have sexual relations. But because radiation therapy may cause fatigue, your desire for physical intimacy may lessen. For most patients, these feelings are temporary.

What causes fatigue?

During radiation therapy, the body uses significant energy healing itself. Illness-related stress, daily trips to the clinic for treatment, and the effects of radiation on normal cells all contribute to fatigue. Most people begin to feel tired after two to three weeks of therapy. This should dissipate after your treatment is finished.

Help yourself during radiation therapy by not trying to do too much. If you feel tired, limit your activities. Use leisure time in a restful way. Do not feel that you have to do all the things you normally do. Try to get more sleep at night, and rest during the day if you can.

How are skin problems treated?

Over the course of your radiation treatments, your skin in the treatment area may become red, irritated, sunburned, tanned, or dry. Your MRO care team will have advice on how to relieve any itching or discomfort.

In some cases, particularly in areas where there are skin folds, you may experience a "moist reaction." This is when the skin becomes especially wet and sore. It is important to notify your radiation care team if you develop this condition, and they will give you suggestions on how to keep these areas dry.

Be very gentle with your skin and avoid irritating areas being treated. When you wash, use only lukewarm water and mild soap. Try to avoid tight clothing over the area. Try not to rub or scratch any sensitive spots. Also, avoid putting anything that is very hot or very cold, such as heating pads or ice packs, on your treated skin.

Avoid any powders, creams, perfumes, deodorants, body oils, ointments, lotions, or home remedies in the treatment area while you are being treated, and for several weeks afterwards, unless approved by your radiation care team. Many skin products leave a coating on the skin that may interfere with your therapy or healing.

Avoid long sun exposures to the area being treated even after your treatment is complete. If you expect to be in the sun for more than a few minutes, wear protective clothing, such as a hat with a broad brim and a shirt with a high neck, and use sunscreen. Ask your MRO care team about sunscreen lotions.

The majority of skin reactions to radiation therapy should go away a few weeks after treatment is finished. However, in some cases the treated skin will remain darker than it was before.

What can be done about hair loss?

Radiation therapy can cause hair loss, but only in the treated area. For example, if you receive radiation treatment to your hip, you will not lose hair from your head. Radiation treatment to your head, however, may cause you to lose some or all of the hair on your scalp.

Many patients find that their hair grows back once the treatments are finished. But accepting hair loss can be a hard adjustment. The amount of hair that grows back will depend on how much radiation you receive and the type of radiation treatment your radiation oncologist recommends. Chemotherapy can also affect hair loss.

You may want to cover your head with a hat, turban, or scarf, especially while out in the sun. If you prefer a wig or toupee, be sure the lining does not irritate your scalp.

A hairpiece is tax-deductible if it is used because of cancer treatment, and it may be covered in part by your health insurance. If you plan to buy a wig, it is a good idea to select it early in your treatment so you can match the color and style to your own hair.

How do I manage nausea?

Some patients report feeling queasy for a few hours after radiation therapy. This side effect may be related to your emotions and concerns about radiation treatment. Try to unwind before your treatment by reading a book, writing letters, working on a crossword puzzle, exercising, listening to music, or talking with friends or a counselor.

If you experience nausea, try not eating for several hours before your treatment, or limiting yourself to a bland snack of toast or crackers and apple juice. After radiation treatment, you may want to wait one to two hours before eating again. If the problem persists, ask your MRO care team to prescribe a medicine to prevent nausea.

Here are some tips to help an unsettled stomach:

- Stick to any special diet that your doctor or dietician gives you.
- Eat small meals.
- Eat often, and try to eat and drink slowly.
- Avoid foods that are fried or high in fat.
- Drink cool liquids between meals.
- Eat foods that have only a mild aroma and can be served cool or at room temperature.
- For a severe upset stomach, try a clear liquid diet (broth and juices) or bland foods that are easy to digest, such as dry toast and gelatin.

What if I experience eating problems during radiation treatment?

Some side effects from radiation therapy can cause problems with eating and digesting food. You may lose your appetite or have pain when you chew or swallow. Because proper nutrition can help your damaged tissue repair itself, you need to pay special attention to your diet.

Try to eat small meals often and enjoy a variety of foods. Your MRO radiation care team will tell you whether your treatment calls for a special diet. If you are losing weight, a dietician can offer ideas to help you build and maintain your weight.

There are a number of diet guides available to help with short-term eating problems. "Eating Hints," a booklet published by NCI, offers excellent advice on how to maximize calories and protein without eating larger quantities. It includes recipes for the whole family, and highlights meals for people with special concerns, such as lactose intolerance.

If you have pain when you chew and swallow, your MRO care team may recommend a powdered or liquid diet supplement. Many of these products are available over the counter at the drugstore and come in a variety of flavors. They can be consumed alone, or combined with other foods, such as pureed fruit, or added to milkshakes. Ask your dietician or pharmacist for more information.

Loss of appetite can result when changes occur in normal cells. Stress, and the radiation treatments themselves, may cause you to lose your appetite. Even if you are not very hungry, it is important to keep your protein and calorie intake high. Doctors have found that patients who eat well can better handle both their cancer and the side effects of radiation treatment.

Here are some suggestions to perk up your appetite and make the most of it when you feel like eating:

- Eat when you are hungry, even if it's not mealtime.
- Eat several small meals during the day rather than three large ones.
- Use soft lighting, upbeat music, or whatever helps you feel good while eating.
- Vary your diet and try new recipes. If you enjoy company, have meals with family or friends, or turn on the radio or television.
- Ask your MRO care team whether you can have a glass of wine or beer with your meal to increase your appetite. Keep in mind that in some cases, alcohol may not be allowed because it could worsen the side effects of treatment.
- When you feel up to it, make some simple meals in batches and freeze them for later.
- Keep healthy snacks close by for nibbling.
- If other people offer to cook for you, let them. And don't be shy about telling them what you'd like.
- If you live alone, you might want to arrange for "Meals on Wheels" to bring food to you. Ask your doctor, nurse, local American Cancer Society office, or Cancer Information Service about "Meals on Wheels." This service is active in most large communities.
- If you can only eat small amounts, increase your calories per serving by adding butter or oil to your meal.
- Add more calories by drinking milkshakes, eggnog, or prepared liquid supplements between meals.
- Add cream sauce or melted cheese to your favorite vegetables.
- Some people find they can handle large amounts of liquids even when they don't feel like eating solid foods. If that's the case for you, try to get the most from each glass by making drinks with powdered milk, yogurt, honey, or prepared liquid supplements.

Tips on food preparation and eating

If you are having radiation therapy to the throat or chest, you may find swallowing difficult or painful. Some patients say that it feels like something is stuck in their throat.

Here are several ways to ease your discomfort:

- Choose foods that taste good to you and are easy to eat.
- Try changing the consistency of foods by adding fluids and using sauces or gravies to soften them.
- Avoid highly spiced foods and textures that are dry and rough, such as crackers.
- Eat small meals, and eat more frequently than usual.
- Cut your food into small, bite-sized pieces.
- Ask your MRO care team for special liquid medicines that can help you eat and swallow more easily.
- Ask your MRO care team about liquid food supplements that can help you meet your energy needs.
- If you get your radiation oncologists approval, try to drink extra fluids. This will help keep you hydrated and keep mucus and other secretions thin and manageable.
- If your sense of taste changes during radiation therapy, try different methods of food preparation.

How do I handle mouth or throat problems?

Soreness in your mouth or throat is common with treatments to the head and neck region, and may appear in the second or third week of external radiation therapy. It will likely end a month or so after treatment ends.

During this time, you may have trouble swallowing because of a dry mouth. Your MRO care team or dentist can prescribe medicine for this discomfort and advise you on methods to relieve other mouth problems.

If you wear dentures you may notice they no longer fit. Irritation of gums may happen during radiation treatment and can change the shape of your gums after treatment. This can happen if radiation causes swelling in your gums. It is important to not let your dentures cause sores that may become infected. You may need to stop wearing your dentures until radiation therapy is over.

Your salivary glands may produce less saliva than usual, making your mouth feel dry. Here are some tips for dry mouth:

- Sip cool drinks throughout the day. Water may be your best choice.
- In the morning, fill a large cup with ice water and carry it with you so you have something to drink during the day.
- Keep a glass of cool water at your bedside at night.
- Sugar-free candy or gum may also help.
- Avoid tobacco and alcoholic drinks. They dry and irritate mouth tissues.
- Moisten food with gravies and sauces to make eating easier.

If these measures are not enough, ask your dentist about artificial saliva. Dry mouth may continue to be a problem even after treatment is over.

Dental care

Radiation treatment for head and neck cancer can increase your chances of getting cavities. Before starting your therapy, your MRO care team will assist you in arranging for a complete oral checkup to ensure treatments may safely begin. Your dentist will probably want to see you over the course of your radiation therapy to give you detailed instructions about caring for your mouth and teeth to reduce the risk of decay and help deal with possible soreness.

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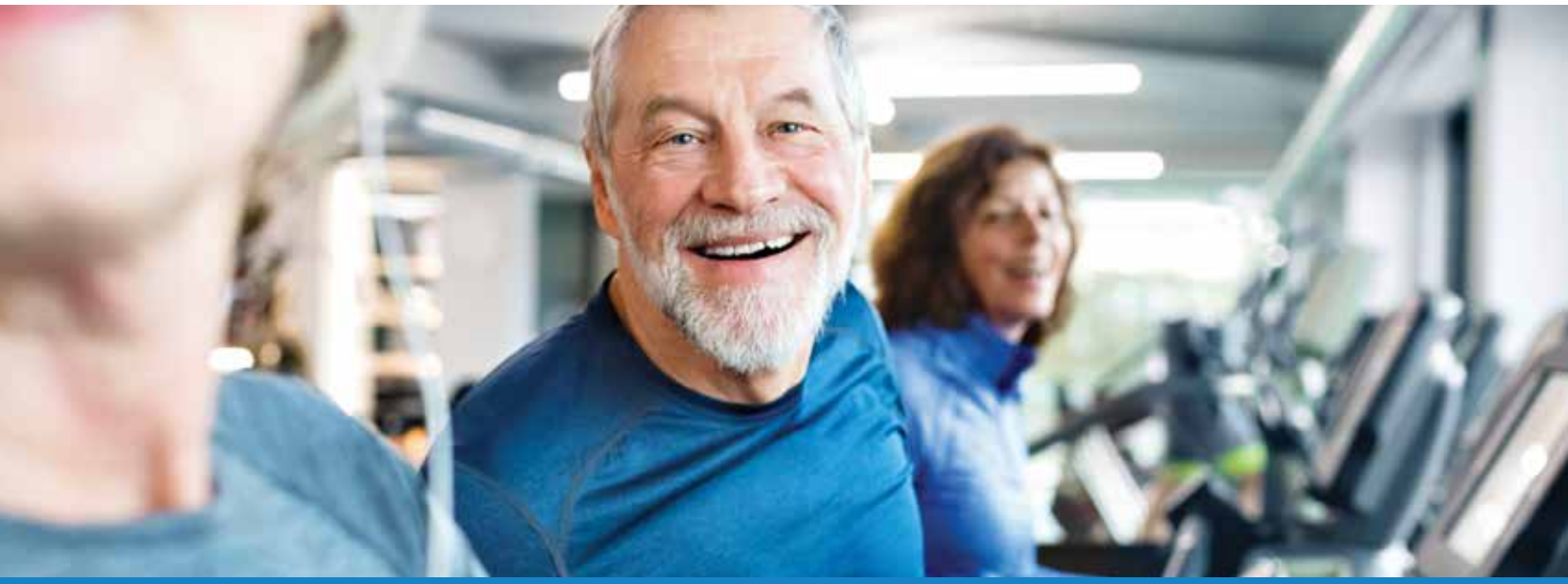

Life after cancer treatment

Taking good care of yourself is a critical part of life after cancer treatment. At Minneapolis Radiation Oncology, we'll give you the tools and support you need to do this.

After your treatments are over, your MRO radiation oncologist may want to re-examine you to check the results, and the doctor who referred you for radiation therapy will schedule follow-up visits as needed. Follow-up care may also include more cancer treatment, rehabilitation, and/or counseling.

Who provides my care after therapy?

After your radiation treatments end, you will receive ongoing follow-up care from your referring doctor, who may be a surgeon, a medical oncologist, or your primary physician. You may also return to your radiation oncologist for regular visits. Your follow-up care will depend on the kind of cancer you have and on other treatments you had or may need.

What other care might be needed after radiation therapy?

Just as every patient is different, follow-up care varies. Your oncologist will prescribe and schedule your next steps. Do not hesitate to ask about the tests or treatments your oncologist orders. MRO will help you learn everything you can to take good care of yourself.

Here are some questions you may want to ask your doctor after your radiation therapy ends:

- How often do I need to return for checkups?
- Why do I need more X-rays, scans, or blood tests?
- What will these tests tell us?
- Will I need chemotherapy, surgery, or other treatments?
- How will you know whether I am cured of cancer?
- What are the chances that the cancer will come back?

- How soon can I go back to my regular activities? Work? Sexual activity? Sports?
- Do I need to take any special precautions?
- Do I need a special diet?
- How soon can I have reconstructive surgery?

What if pain is a problem?

If pain persists after radiation therapy ends, try using mild pain medicines. Do not use a heating pad or warm compress to relieve pain in any area treated with radiation.

If you have severe pain, ask your MRO radiation care team about prescription medications or other methods of relief. Be specific when describing your pain, so you can get the best treatment for it.

If you still cannot find relief from your pain, you may be referred to a doctor who is a pain specialist.

What can I do to help myself after radiation therapy ends?

After radiation therapy ends, you will still need to take special care of yourself. It is normal to need extra rest–this means your healthy tissues are rebuilding. Take naps as needed and try to get more sleep at night. Work back into your pre-treatment schedule of activities by reintroducing them a little at a time.

Skin problems may persist for several weeks after treatment ends. Continue to be gentle with your skin in the treatment area until all signs of irritation are gone. Do not try to scrub off the marks in your treatment area.

What about returning to work?

Many people continue to work during their radiation therapy. However, if you have taken time off of your job, or have altered your work activities due to treatment, ask your radiation oncologist when you should be able to return to work.

When you are ready to go back to work, you'll want to learn about your rights concerning your job and health insurance. If you have any questions about employment issues, contact the Cancer Information Service or the American Cancer Society. They can help you find local agencies that respond to problems cancer survivors sometimes face regarding employment and insurance rights.

When should I call the doctor?

After cancer treatment, you are likely to be more aware of your body and notice even slight changes in how you feel from day to day. Tell your MRO care team if you exhibit any of these problems:

- A pain that does not go away, especially if it is always in the same place.
- Lumps, bumps, or swelling.
- Ongoing nausea, vomiting, diarrhea, or loss of appetite.
- Unexplained weight loss.
- A fever or cough that does not go away.
- Unusual rashes, bruises, or bleeding.
- Any other signs mentioned by your doctor or nurse.

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Educating patients and families

Finding out information about your cancer and treatment options can be overwhelming. To help you and your family learn more about your cancer diagnosis, treatment options, and possible side effects, here are some valuable online resources.

Cancer resources

A wealth of information on cancer is available on the web. We've collected this useful list of websites to help you and your family learn more about your cancer diagnosis, therapy treatment, and possible side effects.

American Brain Tumor Association [ABTA]

Provides services and programs for brain tumor patients. **www.abta.org/twincities**

American Cancer Society

The American Cancer Society website is an excellent online resource for anyone wanting to know more about cancer. Find cancer facts and figures, inspirational stories, and links to cancer support programs. Also, read the latest news. **www.cancer.org**

American Society for Radiation Oncology

To help you and your family better understand the treatment options available to you, the American Society for Radiation Oncology (ASTRO) has created this website to explain how radiation therapy is used to safely and effectively treat cancer. It has links to patient videos, brochures, and presentations. **www.astro.org**

Cancer Hope Network

Cancer Hope Network matches cancer patients and their caregivers with trained volunteer cancer survivors who have undergone similar experiences and recovered. **www.cancerhopenetwork.org**

CancerCare

CancerCare is a nonprofit that provides free, professional support services to anyone affected by cancer: people with cancer, caregivers, children, loved ones, and the bereaved. CancerCare programs include counseling, support groups, education, financial assistance, and publications. **www.cancercare.org**

Gilda's Club Twin Cities
Gilda's Club is a nonprofit organization where everyone dealing with cancer can come for social, emotional, and psychological support. **www.gildasclubmn.org**

Live Strong
Live Strong offers diet, nutrition and fitness tips for a healthier lifestyle. **www.livestrong.org**

National Cancer Institute
The National Cancer Institute coordinates the National Cancer Program, and provides accurate up-to-date comprehensive cancer information on cancer research. **www.cancer.gov**

National Comprehensive Cancer Network
The National Comprehensive Cancer Network (NCCN) is an alliance of the nation's 33 leading cancer centers. The NCCN site offers extensive information on many types of cancer. **www.nccn.org**

National Lymphedema Network
The NLN is a nonprofit organization that provides information about risk reduction and the management of lymphedema. **www.lymphnet.org**

RT Answers
RT Answers gives you answers to your radiation therapy questions. There is an excellent video that walks you through the process of radiation therapy and helps you understand what to expect when you undergo treatment. **www.rtanswers.org**

Stupid Cancer
Stupid Cancer is the largest nonprofit charity that comprehensively addresses young adult (ages 15-39) cancer through advocacy, research, support, outreach, awareness, mobile health, and social media. **www.stupidcancer.org**

Support for People with Oral and Head and Neck Cancer (SPOHNC)
SPOHNC is a nonprofit organization dedicated to raising awareness and meeting the needs of oral and head and neck cancer patients through its resources and publications. **www.spohnc.org**

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Billing and insurance

Charges

All of the charges for your radiation therapy will be billed by Minneapolis Radiation Oncology, P.A. at the end of your course of treatments. Your charges will be based on the complexity and duration of services.

Service dates

We provide a number of services that may occur when you are not present. For example, you may notice a bill for a service that occurred on a date when you were not in the department. Typically, computer planning, dose calculations, and physics checks do not require your presence. However, due to insurance regulations, we must bill these services the date they were rendered. Additional co-payments may be applied to these services.

Insurance

Minneapolis Radiation Oncology, P.A. accepts most major insurance policies, Medicare, Medicaid, and private payment. We also accept Visa and MasterCard. We will file all insurance claims (primary and secondary), and release protected health information, provided we have the complete and accurate information, including your signature, on file.

Co-pays

For your initial visit, you will be billed for a consultation or office visit. If you have a co-payment for office visits, a co-payment would apply. Please pay your co-payment at the time of this visit. For your radiation therapy, all additional charges will be billed under radiation therapy codes. Some patients have co-payments per date of treatment. Please contact your insurance company if you have any questions regarding co-payments. These additional co-payments will be billed to you after your insurance company processes the claim.

Networks

If your insurance plan requires you to see a physician who is participating in your specific plan, YOU MUST CONTACT YOUR INSURANCE CARRIER TO VERIFY THAT OUR PHYSICIAN IS IN YOUR NETWORK. Some examples of these plans may have the following listed on your insurance card: PCP, POS, PPO, Network, Specialty Network, and Primary Care. GOING OUTSIDE YOUR NETWORK MAY CAUSE YOU TO TAKE ON LARGE FINANCIAL RISKS.

Referrals

Many plans require referrals. If you are assigned a primary care clinic, you will need a referral for your treatments. Notify your primary care physician that you will be receiving radiation therapy treatments. Please talk to the receptionist to verify that she is obtaining a referral for your treatments.

Additional questions

Please contact our business office and/or your insurance company with any questions or concerns you may have. You can reach us at 952-920-4915, Ext. #108.

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My MRO Chart

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My MRO chart

The My MRO Chart offers you secure, online access to oncology healthcare information anytime and anywhere. Through the My MRO Chart, you can view your appointments and view educational materials all from the comfort of your own home.

Getting Started

Accessing the MY MRO Chart is easy and secure. Visit our website and click on the My MRO Chart link or visit http://myvisit.mropa.com/patientPortal/login. Your MRO care team will provide you with a unique, secure PIN and detailed login instructions.

To login for the first time:

1. Visit the website and click on 'Create Account'
2. Enter your name, date of birth, and PIN
3. Create a username and password and enter your email address
4. You're logged in and ready to go!

To get your PIN, or for more information about accessing the MY MRO Chart for the first time, please contact your MRO care team.

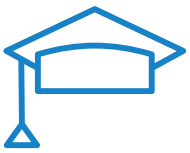
Your Privacy is Important to Us

We take great care to ensure that your health information is safe and private, and encourage you to keep your MY MRO Chart username and password safe. The Patient Portal, MY MRO Chart, is fully compliant with federal and state law related to the privacy of health care information. For more details on information security, please contact your MRO care team.

Working with My MRO Chart

Use the calendar to view all of your appointments in one place. To request a change in your appointments please contact your MRO care team directly.

See a summary of your most recent health information. Download a copy for yourself or send it to a care provider.



Learn more about your diagnosis, side and late effects of treatment, and find advice for getting and staying healthy through educational materials suggested by your care team. Use the resources tab to direct you to useful links recommended by your care provider.

Your fight | Our mission

The Patient Portal is powered by Equicare Health.
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What to ask your doctor

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Notes

Questions for your care team

What kind of radiation therapy is recommended for me?

How can radiation therapy help me?

How many weeks will my treatment plan last?

What side effects should I expect?

Will these side effects go away after my radiation therapy is over?

What late side effects should I expect after my therapy?

What can I do to manage the side effects?

How can the MRO care team help me manage side effects?

How can I learn more about radiation therapy?

MINNEAPOLIS RADIATION ONCOLOGY
mropa.com

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7401 METRO BLVD, SUITE 210
EDINA, MN 55439
PATIENT BILLING: 651-478-8768

MRO | BRAINERD
215 IVY ST
BRAINERD, MN 56401
218-828-7585

MRO | FAIRVIEW RIDGES
201 E. NICOLLET BLVD
BURNSVILLE, MN 55337
952-435-8668

MRO | MERCY
11850 BLACKFOOT ST. N.W., SUITE 150
COON RAPIDS, MN 55433
763-433-0221

MRO | FAIRVIEW SOUTHDALE
6401 FRANCE AVENUE SOUTH
EDINA, MN 55435
952-920-8477

MRO | UNITY
550 OSBORNE ROAD
FRIDLEY, MN 55432
763-784-1182

MRO | NEW RICHMOND
501 HOSPITAL ROAD
NEW RICHMOND, WI 54017
715-243-2950

MRO | NORTH MEMORIAL
3435 WEST BROADWAY
ROBBINSDALE, MN 55422
763-521-1426

MRO | ST. FRANCIS
1475 ST. FRANCIS AVENUE
SHAKOPEE, MN 55379
952-428-2663

MRO | METHODIST
6500 EXCELSIOR BLVD
ST. LOUIS PARK, MN 55426
952-993-6032

MRO | REGIONS
640 JACKSON STREET
ST. PAUL, MN 55101
651-254-2039

MRO | RIDGEVIEW
560 SOUTH MAPLE, SUITE 10
WACONIA, MN 55387
952-442-6000