

## BMDA Radiation Treatment to the Spine

**Primary spine tumors** may arise from the spinal cord, tissue surrounding the spinal cord and brain, or other soft tissue and bony structures. Some of these are rare cancers of the spine, skull, bone and brain.

**Spinal metastases** occur when cancer spreads and grows in the bones of the spine or spinal cord. Cancer that spreads to the spine often comes from the lungs, breast, prostate, kidney, skin (melanoma), colon or thyroid.

### Symptoms Caused by Spine Tumors

Tumors in the spine can cause painful symptoms. If not treated, spinal tumors can cause:

- Ongoing back or neck pain
- Spinal cord compression leading to:
  - Loss of sensation: This can reduce the ability to feel cold, heat or pain.
  - Muscle weakness leading to problems walking or balancing
  - Bowel and bladder incontinence or problems urinating
  - Numbness and tingling of the hands, arms or legs
  - Paralysis: This is loss of movement in parts of the body especially on the extremities.

### Diagnosing Spinal Tumors

Your doctor may order several exams and tests to learn more about your cancer.

#### These may include:

- Exam – Your doctor will perform a detailed clinical exam.
- Imaging tests – These may include an MRI, CT scan, bone scan, PET scan or x-ray.
- Biopsy of the tumor – A small tissue sample is taken to check under a microscope.

### Treatment

Spinal tumor treatment depends on many factors such as the type of tumor, location of the tumor and general health of the patient. Treatments are discussed below.

- **Chemotherapy, immunotherapy and targeted therapy** – These treatments use cancer fighting medicines to destroy cancer cells in the spine and throughout the body. The medicines are given through a vein in your arm or hand, or you may take pills. Medicines such as dexamethasone (a steroid) can be used to reduce swelling if the tumor is pressing against the spinal cord.
- **Surgery** – Surgeons remove the tumor to relieve pain and other symptoms. Surgery may also help protect spine and body functions and stabilize the spine.
- **Radiation treatment** – Radiation uses high dose x-rays to destroy tumor cells or shrink the tumor. Shrinking the tumor can make it small enough to reduce or eliminate pain. Radiation can also help with or relieve other symptoms such as weakness, numbness and tingling. Your care team will talk with you in detail if radiation is right for you.

## Your Care Team

Many different specialists will help plan your treatment and care for you. These may include doctors, advanced practice providers, nurses, radiation therapists, dosimetrists, physicists and others. Talk with your care team about any concerns you may have.

## Consult Visit

Your doctor will meet with you during a consult visit. During this visit, the doctor will advise you about the benefits, risks and possible side effects of radiation. Your care team will ask you to sign a consent form if you agree to radiation.

## Tell your doctor if you have any of the following:

- Implanted electronic devices – These include a pacemaker, defibrillator, cardiac loop recorder, neuro stimulator, drug infusion pump and VP shunt.
- Previous radiation treatment
- Problems lying flat
- If you are pregnant or may be pregnant
- Fear of enclosed places
- You need sedation for certain diagnostic tests, such as an MRI

Your radiation team carefully creates a custom plan to ensure that you receive safe and accurate treatment. Treatment is carefully planned to target the cancer while avoiding nearby healthy organs. Special computers monitor and check the treatment machine to ensure that you receive the proper treatment.

## Simulation

The radiation process begins with a treatment planning session called a simulation. This procedure helps locate the exact area to be treated. During simulation, you will lie in the same position as you will be for treatment. Special devices may be used to reproduce the same position during treatment. A CT scan will be taken. This scan helps the doctor map the treatment areas on your body.

- The radiation therapist will make a mold of the part of your body that needs to remain still.
- They will shape the mold to fit around your body. Molds are used every day of treatment to ensure correct positioning.
- The therapist may place temporary marks on your body. They may place adhesive tape on the marks to help them stay in place.
- The simulation process can take 45 minutes to 1 hour.
- You will be asked to wear specific clothing and to bring your medicines for pain, anti-anxiety or others (if needed) with you.
- If needed, you will use the restroom before simulation.
- There are no diet restrictions. You may eat as you normally do unless your care team gives you other instructions.

## Treatment Schedules

You will receive radiation therapy every weekday, Monday through Friday, and have rest days on Saturday and Sunday. A staff person will contact you if the clinic plans to close for a scheduled holiday.

Due to the high number of patients we treat, we cannot guarantee schedule requests or changes. Spine radiation treatment is usually scheduled anywhere from 2 to 7 weeks depending on the type of the tumor being treated.

**Plan to check in at least 15 to 20 minutes before your appointment time.**

## Preparing for Treatment

- If you wear a device such as a continuous glucose monitor or insulin pump on your body, check with your treating doctor and the equipment manufacturer before starting your treatment.
- If you have a pacemaker or defibrillator implanted in your body, you will need an interrogation of the device prior to starting radiation, and after completing radiation therapy.

## During Treatment

A radiation therapist will position you on the treatment table. Although the actual treatment lasts only a few minutes, the entire process may take 15 to 30 minutes. The radiation therapist helps you remain completely still.

After the therapist leaves the treatment room, you are alone in the room. The therapist will talk with you through a two-way intercom and can see inside the room through a closed circuit television. The radiation beams are painless. You can speak or use a special signal if you need something. The therapist can turn off the machine and go into the treatment room if needed.

## Weekly Management Visits

Patients who receive three or more treatments will see their radiation doctor once a week while they are receiving radiation. Check your radiation schedule for these appointments. These are often referred to as “weekly on treatment” visits.

## Side Effects

Side effects depend on the part of the spine that is treated, the dose of radiation and your overall health.

## Early Side Effects

- **Nausea and Vomiting** – Some patients have nausea or vomiting during treatment. Your care team may prescribe an anti-nausea medicine for you. Take this 30 minutes before treatment to help ease nausea and vomiting.

- **Esophagitis** – Esophagitis happens when your esophagus (food pipe) is irritated or swollen. This may cause swallowing problems for you. Your doctor may prescribe lozenges, sprays or other medicines to help numb your throat. Taking these before meals and at bedtime may be very helpful when eating meals. Eat soft foods that are easy to chew and swallow. It may be easier to eat foods that are cool or at room temperature. Avoid eating citrus, spicy, salty, rough and dry foods. Your care team can give you more information about how to manage esophagitis.
- **Diarrhea** – During and after radiation treatment, your bowel movements may be softer or occur more often than usual. If this happens, you may try reducing the amount of fiber and fat in your diet. Avoid foods that can cause gas and cramps. Make sure to drink 64 to 80 ounces (about 2 quarts) of fluids each day. If you have diarrhea, eat foods high in potassium, such as bananas, potatoes and orange juice.
- **Fatigue** – It is normal to feel weak, tired or exhausted. During treatment, the body uses more energy to recover. Fatigue may worsen over the course of treatment and may last up to 3 to 4 weeks after treatment ends. It is best to continue your daily routine. Take naps as needed.
- **Skin changes** – You may notice minor dryness, flaking, redness and darkening or itching of the skin. Report any changes to your care team. You may use Aquaphor®, available over-the-counter, to help manage skin changes.
- **Rectal irritation** – This can happen if the pelvis is in the treatment field. Patients may have pain with bowel movements and have a sore rectum. These symptoms may be mild. If symptoms worsen, contact your care team. They may prescribe medicine to help ease symptoms.
- **Bladder irritation** – This symptom can be caused by swelling or soreness of the bladder lining. You may feel an urgent need to urinate and a frequent need to urinate. Tell your doctor if you have symptoms.
- **Hair loss** – Patients may lose some or all of their hair. This depends on the treated area and the radiation dose. Hair loss is usually temporary and regrows 6 to 9 months after treatment ends. You may wash your body and hair with soap that is free of perfume and preservatives.
- **Changes in blood count** – Bone marrow is soft tissue inside bones that make blood cells. Your blood counts may drop if a large area of bone marrow is in the treatment field. Your care team will watch for this and manage if needed.
- **Pain flare and swelling** – Pain flare is a short-term increase in pain. During treatment, the treated area may become swollen and painful. Your doctor may prescribe a steroid medicine to help with this.

## Long-Term Side Effects

- **Scarring of treated skin** may occur.
- **Spinal cord or nerve damage** may cause loss of strength, feeling, or coordination in any part of the body.
- In children, additional late reactions may occur. **These include:**
  - Problems with bone and tissue growth

- Bone damage to the spine. This may cause stunting of growth, curvature of the spine and reduction in height.
- Second cancers may develop in the treated area.
- **Bladder problems** – These may include scarring or hardening of the bladder wall and narrowing of the urethra. This may cause a frequent need to urinate, burning while urinating, blood-tinged urine or problems passing urine.
- **Bowel problems** – These can include weakening of the lining of the bowel and scarring inside the bowel. This may lead to problems with digesting food or absorbing nutrients. Scar tissue (adhesions) in the bowel may also cause bowel obstruction.
- **Sexual problems** – These can include inability to have children (infertility), problems with menstruation or other sexual problems.
- **Bone changes** – Radiation can weaken bones, leading to bone fractures.

## Follow-Up Care

Follow-up visits and imaging scans are usually scheduled 2 to 3 months after treatment. Your care team will let you know when to schedule follow up appointments

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