

Stereotactic Body Radiotherapy

I. Introduction

Stereotactic body radiotherapy is an external radiotherapy that delivers extremely precise and highly intense radiation dose to the tumour. It involves complex planning and precise image guidance to pinpoint the tumor for a highly precise radiation delivery to prevent the tumour from growing while preserving the surrounding normal tissues. As each radiation fraction can deliver a highly intense radiation dosage, the duration of treatment can be as short as one to a few radiation fractions.

Common sites for radiotherapy include head & neck, thorax, abdomen (e.g. liver, pancreas, kidney), pelvis, bone, lymph node, etc. Doctors will determine the appropriate treatment plan according to the location of the tumor and the disease condition.

II. Procedure

- You will not experience any pain during the treatment procedure.
- Before each session, our staff will make sure that you are in the correct position for treatment. You will then stay in the treatment room alone for minutes while radiotherapy is being delivered.
- You will be closely monitored through a closed-circuit television system. You can speak to us using the intercom if necessary.

III. Risks and Complications / Side Effects

- Although radiotherapy is an effective treatment for your disease, it can cause short-term and long-term side effects. Our medical and nursing staff will offer appropriate treatment to help you complete the course of radiotherapy and recover from your illness.
- Side effects may include, but are not necessarily limited to the ones listed below. Each patient reacts differently and may experience none, some, or all of the complications to a varying degree of intensity. If other types of treatment such as chemotherapy are given in conjunction with radiotherapy, some of the side effects may be exacerbated. Complications are also more common in patients who had previous surgery or radiotherapy to the area treated.
- Most of the common side effects go away several weeks after the radiation therapy

is completed; but in some rare cases, side effects can be serious and / or long-lasting.

A. Common Side Effects (Usually Short-Term)

1. Tiredness, nausea and decreased appetite.
2. Skin dryness, reddening, irritation, darkening. In severe cases: non-healing wound, chronic inflammation, contracture, hardening, or ulceration in the area treated.
3. Temporary hair loss in the area treated.
4. Poor surgical wound healing.
5. Tissue swelling and pain at the treatment sites (such as throat, esophagus, bones, etc.); they are usually short-term and manageable by supportive medication.
6. If part of the mouth or throat is in the radiation field: sore throat or discomfort on swallowing, dry cough.

B. Uncommon / Rare Side Effects

The following side effects are rare, but may be long-term and / or severe. The manifestation of these side effects depends on the location and dose of treatment.

- Bone:
 1. Decrease in bone strength leading to fracture.
 2. Nerve injury, leading to numbness, tingling sensation, weakness of limbs and incontinence.
 3. Displacement of surgical material.
 4. For other side effects resulting from the radiation to the near-by structures in relation to the treatment location, please refer to the side effects of the corresponding region below.
- Head and Neck:
 1. Dry mouth. This may predispose to dental caries and gum inflammation.
 2. Permanent change or loss of taste.
 3. Muscle or nerve damage causing difficulty in speech or swallowing.
 4. Narrowing or in-coordination of food passage causing swallowing problem which may cause chest infection in severe cases. Tube or gastrostomy feeding may be required.

○ Thorax:

1. Lung inflammation, scarring or collapse; which may cause dry cough, shortness of breath and/ or low-grade fever.
2. Rib fracture, which does not usually cause any symptoms.
3. Airway narrowing causing decline in lung function.
4. Damage to airway with massive bleeding.
5. Ulceration or narrowing of the esophagus causing problems with swallowing; fistula between the esophagus and airway resulting in choking, chest infection and/ or bleeding.
6. If high radiation dose given to heart: heart problems such as irregular heartbeats, ischemic heart disease, inflammation and impairment of heart function.
7. Great vessel damage including injury to vessel wall and abnormal dilatation, severe bleeding.
8. Injury to nearby nerve structure (e.g. brachial plexus, spinal cord), which may result in numbness, tingling sensation, weakness of limbs and incontinence.

○ Abdomen:

1. Upper abdomen discomfort; stomach or duodenum ulceration and bleeding.
2. If there is severe damage to stomach or intestine causing fistula formation, further surgery may be required.
3. If high radiation dose is given to the liver: liver damage causing prolonged impairment in liver function.
4. If high radiation dose is given to the kidney: kidney damage causing impaired kidney function and/or high blood pressure.
5. If high radiation dose is given to the pancreas: increased chance of developing diabetes mellitus.
6. Great vessel damage including injury to vessel wall and abnormal dilatation, severe bleeding.

○ Lower Abdomen / Pelvis:

1. Chronic diarrhea, irregular bowel habit or chronic abdominal pain.
2. Bowel injury resulting in obstruction, ulceration, perforation, bleeding.
3. Bladder damage causing pain, blood in urine or recurrent infection.
4. Contraction of the urinary bladder and frequent urination.

5. Stricture in the ureters, urethra or bladder neck leading to renal failure. The risk is increased in patients who had previous surgery to the area treated.
6. Male patients: erectile dysfunction, infertility.
7. Female patients: premature menopause, dryness or narrowing of the vagina, infertility.
8. Severe radiation injury to bone or soft tissue in the treated area causing chronic pain, infection, ulceration and bone fractures. Surgery may be required.
9. Femoral head bone necrosis.
10. Nearby nerve injury, resulting in numbness, tingling sensation, weakness of limbs and incontinence.

Note:

- Radiation-induced tumours may occur, but this is rare.
- Growth of irradiated area may be affected in children.
- On rare occasions, patients may develop severe life-threatening complications due to radiotherapy and die.
- It is possible that the intended treatment outcome cannot be achieved, the disease may not be alleviated and it may recur or progress in the future.
- Despite all precautions, unpredictable and unpreventable adverse outcomes may occur after treatment. Please kindly read and fully understand the content above before deciding on undergoing the treatment mentioned.

IV. Before the Treatment / Preparation

1. The treatment plan and radiotherapy schedule depends on the type & location of the tumour, as well as your health condition. Your doctor will discuss the details with you and explain how you can cope with the treatment side effects.
2. Before the treatment, the patient needs to perform body imaging, such as magnetic resonance imaging (MRI) scan, or computed tomography (CT) scan, for tumour localization and planning procedures.
3. Sometimes skin tattooing or a special mould will be made for you to improve treatment accuracy.
4. Our staff will take written, photographic and radiographic records of your treatment details for radiotherapy planning and future reference. These records may be used for research or scientific publication but your confidentiality will be maintained at all times.

5. Avoid applying ointments or creams on the area treated before you attend your radiotherapy session. No other preparation is required unless specific instructions are given by our staff.

Note:

- **Radiotherapy can cause teratogenicity. During radiotherapy, both male and female patients (if applicable) should take contraceptive measures.**
- **Radiotherapy may affect the function of your pacemaker. Please let us know if you have a cardiac pacemaker.**

V. After the Treatment

1. You may feel tired or experience other side effects with radiotherapy. Please consider having a friend or relative accompany you to the hospital if possible.
2. Our doctors will assess you on a regular basis and take appropriate measures to minimize your treatment reactions.
3. If you feel unwell anytime during the treatment period, please inform our staff.

VI. Follow up

1. Recovery varies from person to person; some people can go back to work shortly after completion of treatment.
2. After completing the whole course of radiotherapy, a follow-up appointment will be arranged to assess your response to treatment and look out for complications. Please attend your appointment as scheduled.
3. You must follow instructions strictly on taking medication as directed.

VII. Remarks

This is general information only and the list of complications is not exhaustive. Other unforeseen complications may occasionally occur. In special patient groups, the actual risk may be different. For further information, please contact your doctor.