

## **Stereotactic Radiosurgery / Radiotherapy (Intracranial)**

### **I. Introduction**

Stereotactic body radiotherapy is an external radiotherapy that delivers extremely precise and highly intense radiation dose to the tumour or lesion. It involves complex planning and precise image guidance to pinpoint the lesion for a highly precise radiation delivery 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.

### **II. Procedure**

- You will not experience any pain during the treatment procedure.
- You might need a head frame fixed to your skull under anaesthesia for the treatment depending on the clinical condition.
- Our staff will prepare for you an immobilization cast, if necessary, to ensure reproducibility of the treatment position.
- Image confirmation will be carried out by e.g. X ray, CT scan to ascertain the correct treatment position and target site throughout the radiotherapy process. This is to assure accurate radiation delivery and to reduce potential harmful effect to surrounding tissues and organs. Treatment position verification procedure will be conducted on every treatment day.
- 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 or darkening, colour change or thickening in the area treated.
3. Temporary hair loss in the area treated.
4. Wound swelling, pain, bleeding, inflammation or infection from the fixation frame (if applicable).
5. Pain in the irradiated area due to inflammation. For example, headache & tiredness due to brain swelling and inflammation.
  - In some situations, symptoms caused by the tumour may worsen during the first few days of radiotherapy. This may be caused by transient swelling of the tumour and surrounding tissue with radiotherapy and will usually improve with appropriate treatment. Some patients continue to deteriorate despite radiotherapy. This is mainly due to tumour progression and lack of response to radiation, rather than radiotherapy itself.

### **B. Long-term/ 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.

1. Brain damage / radionecrosis: symptoms include headache, fatigue, epilepsy, limb weakness and numbness. The severity may vary according to the disease and radiation dose received. In serious cases (usually less than 10%), there may be permanent loss of brain function in the affected area. Neurosurgical operation is needed, as clinically indicated, to remove the damaged part of the brain.
2. Problems with the thought processing, mental focusing and / or memory.
3. Postoperative irradiation: impaired wound healing.
4. Skin blistering or peeling which may lead to chronic inflammation, ulceration; skin and soft tissue fibrosis or discoloration; permanent hair loss, scarring and stiffness of muscle and soft tissue in the area treated.

5. Impairment of pituitary gland function - may need long term drug treatment.
6. Damage to blood vessels in the brain - causing a mild increase in the risk of stroke.
7. If the ear is included in the radiation field: irritation or inflammation, tinnitus, hearing loss, discharge or infection of the middle ear may occur.
8. If the eyes are in the radiation field: irritation or inflammation of the eyes.
9. If a high radiation dose is received by the lens: cataract
10. If a high radiation dose is received by the eyes or optic nerve: visual impairment or blindness.
11. If part of the mouth or throat is in the radiation field: sore throat or discomfort on swallowing, dry cough.

**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 or lesion, 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 computer tomography (CT) scan, magnetic resonance imaging (MRI) or angiography for tumour/ target localization and planning procedures.
3. Sometimes skin tattooing or a special mould will be made for you to improve treatment accuracy. You will be referred to a neurosurgeon if a head frame is needed.
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.