

# Radiotherapy in Lung & Thoracic cancer



## Treatment Overview

Lung and thoracic malignancies, such as mediastinal tumors, thymomas, or esophageal cancer, can be treated using Volumetric Modulated Arc Therapy (VMAT) or Stereotactic Body Radiotherapy (SBRT). These advanced techniques precisely deliver high-energy radiation to the treatment area, while minimizing exposure to surrounding healthy tissues. Treatment may be combined with a Real-Time Position Management system with Breath-Hold (RPM-BH) to improve accuracy by minimizing thoracic respiratory motion, or with Four-Dimensional Computed Tomography (4DCT) to ensure dose coverage to the entire treatment area by incorporating tumor motion. Treatment plans are individualized according to tumor characteristics and patient-specific needs, typically consisting of 5 to 35 sessions.



St. Teresa's Hospital  
Oncology Centre

### Volumetric Modulated Arc Therapy (VMAT)

- Volumetric Modulated Arc Therapy (VMAT), also known as RapidArc, represents an advanced radiotherapy technique
- During VMAT treatment, the machine rotates 360 degrees while simultaneously adjusting the intensity, shape and dose rate. This allows for precise targeting of irregularly shaped tumors and sparing surrounding healthy tissues, reducing risk of side effects, such as coughing and esophagitis
- Compared with conventional radiotherapy, VMAT offers the distinct advantage of significantly reduced treatment time, often just a few minutes. Patients are spared from prolonged immobilization on the treatment couch, reducing discomfort during treatment

### Stereotactic Body Radiotherapy (SBRT)

- For smaller tumors, the treatment sessions of Stereotactic Body Radiotherapy (SBRT) are reduced, ranging from 1 to 5, effectively controlling tumor growth and relieving symptoms in a short time. SBRT is ideal for treating tumors in close proximity to critical structures, such as trachea or major blood vessels

### Real-Time Position Management - Breath-Hold (RPM-BH)

- By combining an infrared tracking system with trained voluntary breath-holding, we monitor thoracic motion during respiration. Radiation is only delivered when the patient maintains a stable breath-hold position, ensuring precise target irradiation while maximizing the sparing of critical organs such as the heart and liver

### Four-Dimensional Computed Tomography (4DCT)

- Four-Dimensional Computed Tomography (4DCT) captures the dynamic motion of organs and tumors throughout the entire respiratory cycle, enabling refined optimization of dose distribution in planning procedures. This ensures the radiation beam covers the entire tumor during treatment delivery while reducing irradiation to adjacent healthy tissues

### Image-Guided Radiotherapy (IGRT)

- Image-Guided Radiation Therapy (IGRT) is fully utilized in our centre. Image verification is conducted before each treatment, with a six-dimensional treatment couch to adjust patient positioning, ensuring precise tumor localization and minimizing displacement errors

## RT Techniques

## Features

### Artificial Intelligence

- By incorporating the latest medical technologies, artificial intelligence is integrated into dosimetry procedures to enhance both efficiency and safety

### Tattooless Skinmark

- Delivers precise treatment using the IGRT technique without permanent tattoos
- Eliminates pain and invasive piercing from tattoo marking procedure
- Eliminates cosmetic concerns

### Professional & Efficient

- Surface-guided and IGRT techniques reproduce simulation position accurately
- Employs computerized automatic tracking and verification technology, imaging localization can be completed quickly before each treatment
- With the VMAT technique, treatment duration is reduced (substantially from 30 minutes to less than 10 minutes), increasing treatment effectiveness and accuracy

## Research Development & International Awards

We are dedicated to advancing and refining treatment technologies. Actively participating in international radiation dosimetry competitions, we have been recognized with multiple awards in various cancer contests. For more details, please refer to the "Radiotherapy Planning Awards" brochure.



## RT Procedures & Notice

### 1) First Consultation

Our oncologists will listen and understand your situation carefully to tailor the most suitable radiation therapy scheme for you.

### 2) Simulation & Computed Tomography

A customized immobilization device will be created based on your body contour to ensure stable positioning, followed by a CT scan specifically for radiation dosimetry. This helps the oncologist to define treatment area and prescribe radiation dose accurately.

### 3) Treatment Plan Dosimetry

Our dosimetry team will compute a personalized treatment plan that precisely targets tumor cells while minimizing damage to surrounding healthy tissues.

### 4) Imaging Verification

Before each VMAT treatment, X-ray On-Board Images (OBI) or Cone-Beam CT scans (CBCT) will be used to verify target localization and positioning accuracy.

### 5) Treatment Position Verification & Adjustment

After image verification, we utilize a Six-Degree-of-Freedom (6 DoF) couch to adjust positioning effectively, enhancing treatment precision.

### 6) Treatment Delivery

Radiotherapy will be delivered according to your individualized treatment plan. Each session for thoracic or lung cancer treatment with RPM-BH typically lasts about 15 minutes, and normal breathing treatment typically lasts about 10 minutes.

### 7) Post-Treatment Care and Follow-Up

Throughout the treatment course and following completion, we closely monitor both therapeutic effectiveness and potential side effects.

## Possible Side Effects & Management

### Coughing or Shortness of Breath

- Consult your oncologist for medication to relieve symptoms

### Difficulty in Swallowing

#### (Pain while Swallowing, Chest Burning)

- Eat smaller, more frequent meals, drink plenty of water, and consume liquid food

### Fatigue

- Get plenty of rest, maintain a balanced diet, and ensure adequate nutritional intake

## Service Commitment

Our team has extensive experience in dosimetry and commits to completing your treatment planning and starting treatment within one week.

## RT Charges

We commit to providing professional and high-quality medical services to patients from all backgrounds at reasonable fees. For details on charges, please refer to the "Radiation Therapy Charges" or call 2200 3493 for inquiries.



Contact Us

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Opening Hours

**Monday - Friday**

09:00-18:00

**Saturday**

09:00-12:30

**Sunday & Public Holiday**

Closed



Radiotherapy  
in  
**Lung**  
Thoracic &  
cancer



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