

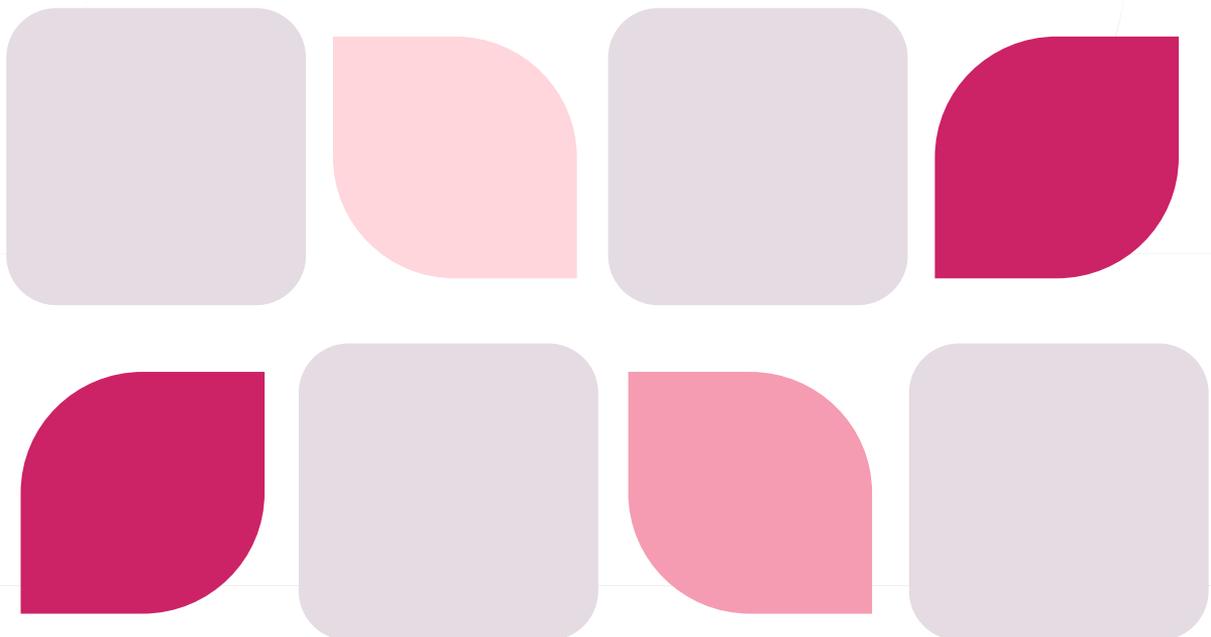
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National Cancer  
Centre Singapore  
SingHealth

# Understanding Radiotherapy for Breast Cancer

A Guide for Patients & Caregivers



An Educational Initiative by National Cancer Centre Singapore



# *Acknowledgements*

**Dr Wong Fuh Yong**

*Senior Consultant, Division of Radiation Oncology*

**Ms Lim Li Hoon**

*Principal Radiation Therapist (Allied Health),*

*Advanced Practitioner Radiation Therapist (Breast), Division of Radiation Oncology*

**Ms Evangeline Ho**

*Radiation Therapist (Allied Health), Division of Radiation Oncology*

**Ms Alice Kor**

*Radiation Therapist (Allied Health), Division of Radiation Oncology*

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# *About this guide*

This booklet serves as a guide for women and men diagnosed with breast cancer embarking on **External Beam Radiotherapy (EBRT) treatment**. It covers preparation for treatment, what to expect during and after treatment, as well as how to care for yourself through this journey.

If the treatment requires **Deep Inhalation Breath-Hold** or use of **Customised Bra**, please refer to page 15 for further resources.

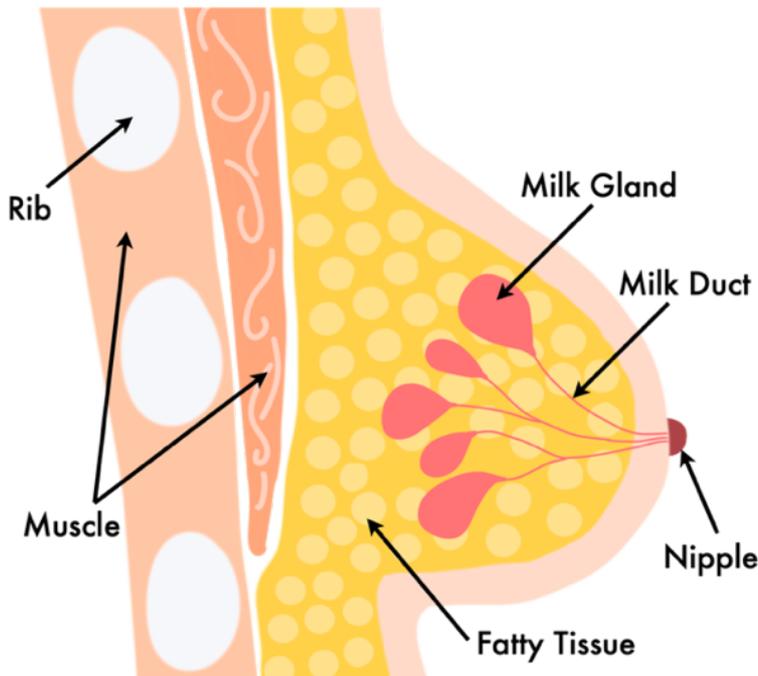
We hope you find this guide useful and we welcome your feedback for future improvement. Please share this guide with your family and friends, if you wish to keep them updated on your treatment journey.

# Contents

	Page
Introduction	1
Radiation Treatment Journey	4
Consultation CT simulation Treatment Planning Treatment Post-Treatment Follow-up	
Treatment Side Effects	10
Supportive Care	13
Common Questions	14
Useful Contacts & Resources	15
Breast Cancer Radiotherapy Summary	16

# Introduction

## The Normal Female Breast



The female breasts are mainly made up of fat and breast tissue. Each breast has many milk-producing glands arranged in 15 to 20 sections, called lobes. The lobes are linked to the milk ducts that carry milk to the nipple during breast feeding.

There are no muscles in the breast, however muscles lie under each breast and cover the ribs.

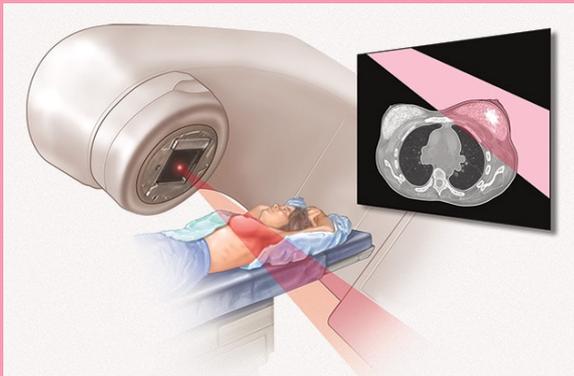
Each breast also contains blood vessels and lymph nodes. Clusters of lymph nodes are found under the arm, above the collarbone, and at the chest area. They carry colourless fluid called lymph. The main function of lymph nodes is to act as a drainage system by cleaning and filtering the lymph from bacteria and waste products before it is returned to the blood. They also produce white blood cells and antibodies to help the body in fighting infection.

## What is Breast Cancer?

Breast cancer is the uncontrolled (or malignant) growth of abnormal cells in the breast. In most cases, the exact cause is not known. The chances of getting breast cancer increase with age. Early breast cancer usually does not have any symptoms. There are many different kinds of breast cancer, which are usually divided into two types: **Ductal carcinoma in situ (DCIS)** and **Invasive breast cancer**.

# What is Radiotherapy?

Radiotherapy, also called radiation therapy, is a form of local treatment that uses high-energy X-rays to kill cancer cells in a part of the body. It aims to reduce the risk of cancer returning in the area where radiation was given. Radiation can be delivered through **External Beam Radiotherapy (EBRT)** or **Intra-Operative Radiotherapy (IORT)**.



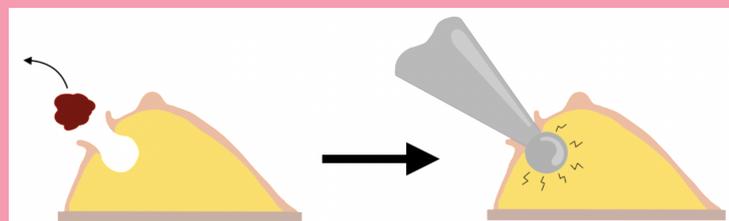
EBRT delivered from linear accelerator <sup>1</sup>

## EBRT

High-energy radiation is released from a machine (linear accelerator) outside the body and directed at the involved chest and underarm area.

## IORT

Direct radiation to the tumour bed at the time of breast-conserving surgery.



IORT delivered to the tumour bed after surgical removal of the tumour

Radiation affects both cancer and their surrounding normal cells. Cancer cells are typically more sensitive to radiation than normal cells, and are less able to repair themselves after being damaged by X-rays. Hence, they die off after radiation. Even though the surrounding normal cells can be affected by radiation, they often recover with time. This can manifest as side effects that originate from the site of treatment, many of which are short-term and temporary. In some cases, long-term complications may also occur.

<sup>1</sup> <https://www.mayoclinic.org/tests-procedures/radiation-therapy-for-breast-cancer/about/pac-20384940>

# Your Radiation Therapy Team



## **RADIATION ONCOLOGISTS**

They are doctors in charge of radiotherapy treatment. They have overall responsibility for the management of each treatment, including planning, follow up and clinical care.



## **RADIATION ONCOLOGY NURSES**

They are trained to provide radiotherapy-related care. They support and care for patients and their caregivers throughout the treatment.



## **RADIATION THERAPISTS**

They are professionals trained in actual delivery of radiotherapy. They also inform, orientate and educate the patients.



## **MEDICAL PHYSICISTS**

They ensure that complex treatments are properly tailored for each patient. They perform quality control programmes for each treatment plan.



## **DOSIMETRISTS**

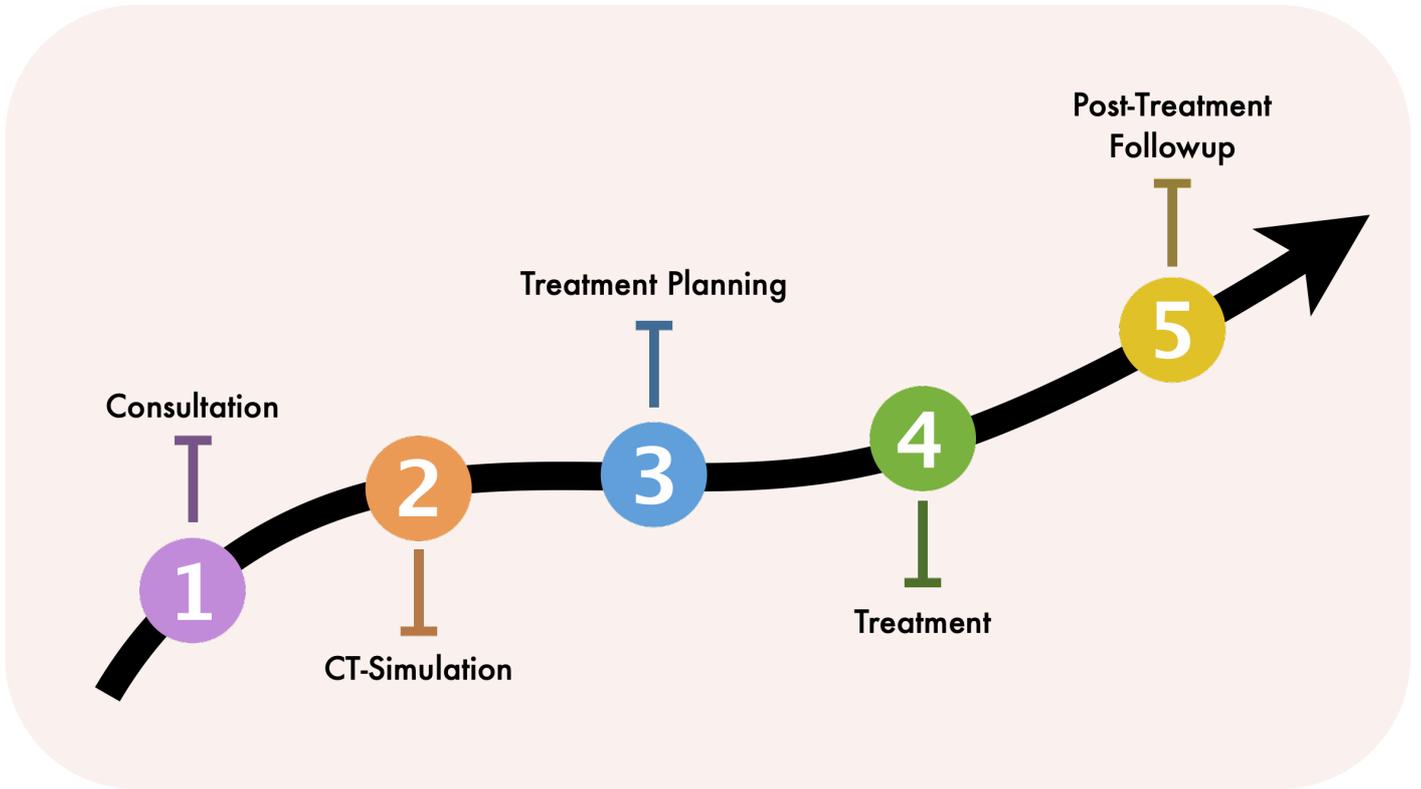
They carefully calculate the dose of radiation and ensure that the tumour is targeted accurately. They develop treatment plans that are customised for you.



## **ANCILLARY STAFF**

They assist in the coordination of patient care and general administration (i.e. appointment booking, financial counselling).

# Radiation Treatment Journey

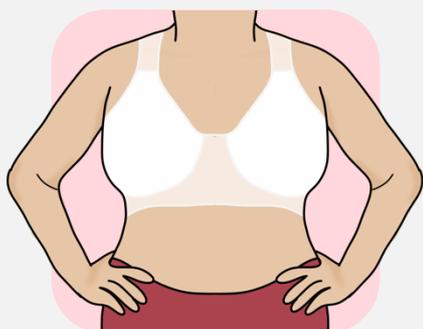


# 1. Consultation

During this session, you will meet your Radiation Oncologist. He or she will discuss the details of your treatment, risk and benefits of radiotherapy, and potential side effects. Your doctor will also answer any questions that you may have.

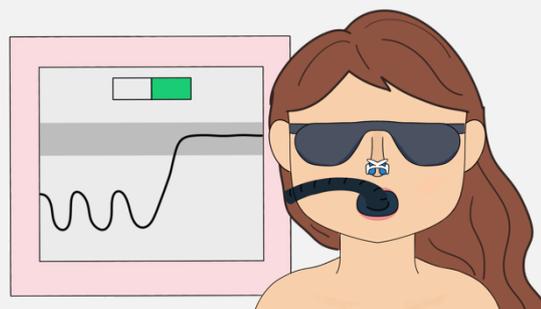
If you are agreeable, a radiotherapy appointment will be made after you have signed a consent form. This comprises a series of appointments, the first of which will be the CT Simulation.

**Your doctor may recommend these radiotherapy treatment approaches depending on your condition.**



**Customised Bra**

Customised bra that is worn during treatment helps to hold the breast tissue in position by preventing the breast from falling over laterally. This reduces dose to vital organs and skin reaction below the breast fold.



**Deep Inhalation Breath Hold (DIBH)**

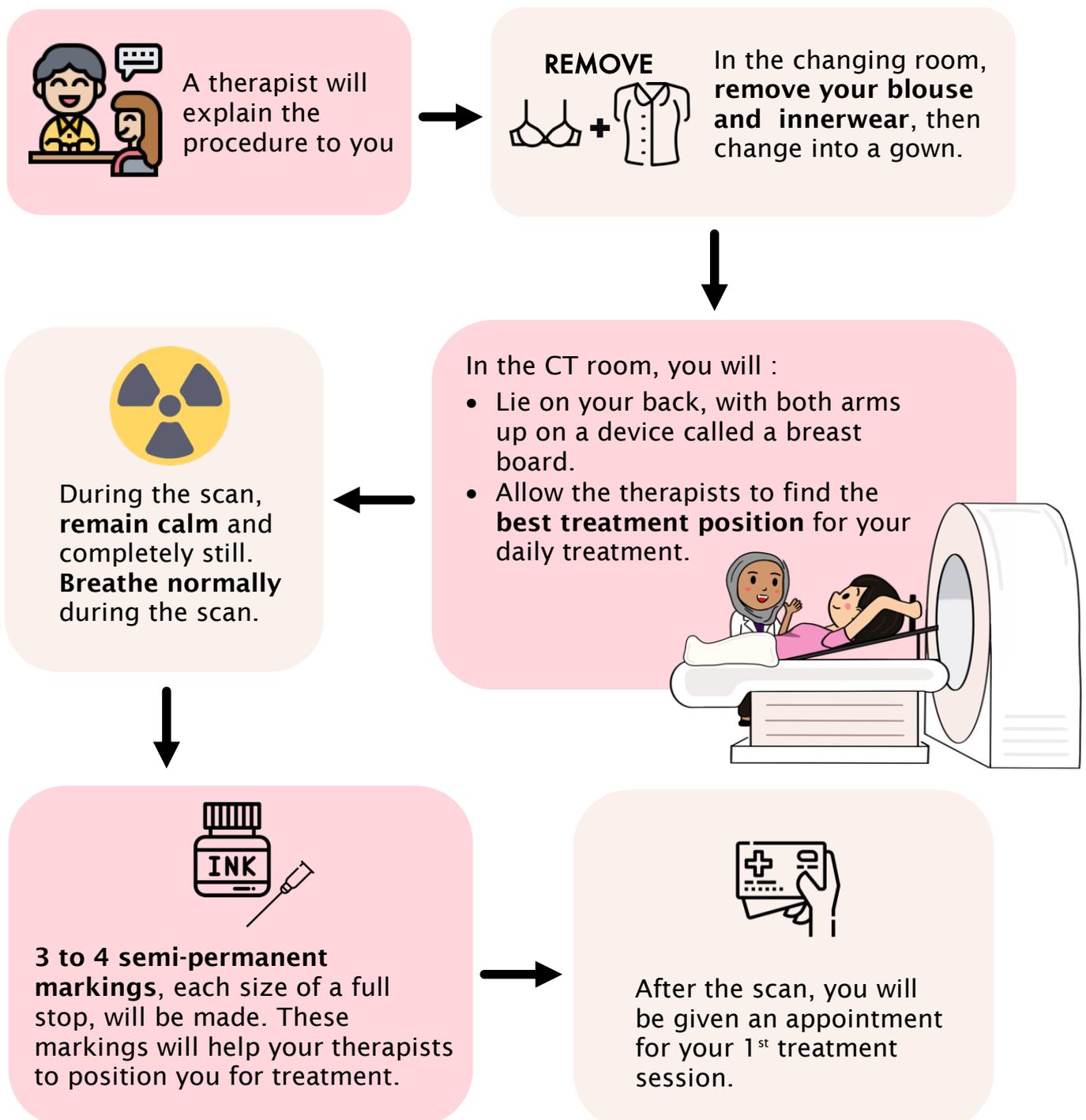
Radiation delivery with the breathing cycle to target the breast or chest wall, and avoid vital organs. It is typically recommended for left-sided breast cancer patients. DIBH can reduce the volume of heart muscle in the radiation field. Your doctor will tell you if you are a suitable candidate.

This booklet will focus on conventional treatment approach for breast cancer. Further information on these two approaches can be found on page 15.

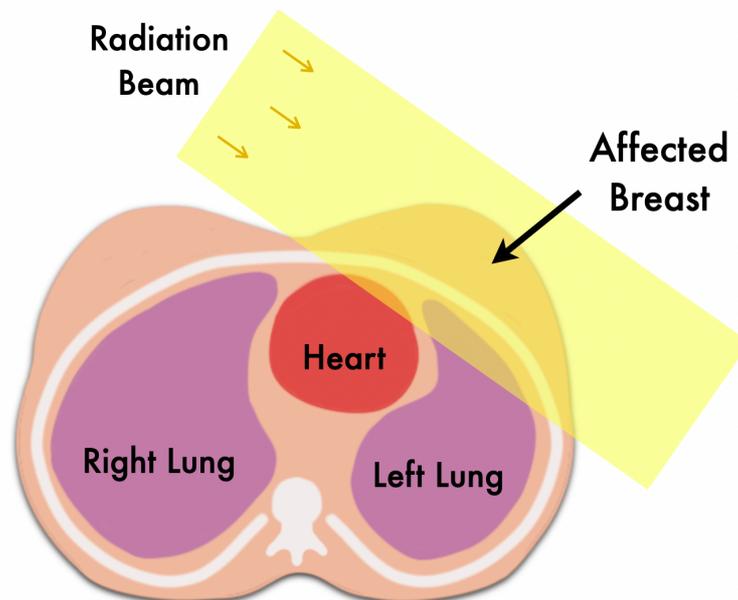
## 2. CT Simulation

During this session, you will meet with our team of Radiation Therapists who will determine the best treatment position for you and obtain a CT scan of the area to be treated.

Please note that this scan is done in a particular fashion specifically for planning and treatment purposes and may not be substituted with your prior CT scans.



### 3. Treatment Planning



Time is needed to generate a precise and optimal plan for your treatment. This is a complex process performed by our team of Radiation Oncologist, Medical Physicist and Dosimetrist.

Computerised treatment planning is used to optimise high radiation dose to the treatment area, while reducing as much radiation dose to the vital organs, like your heart and lungs. Quality assurance checks on the radiation treatment plan will also be performed.

## 4. Treatment

### POSITIONING

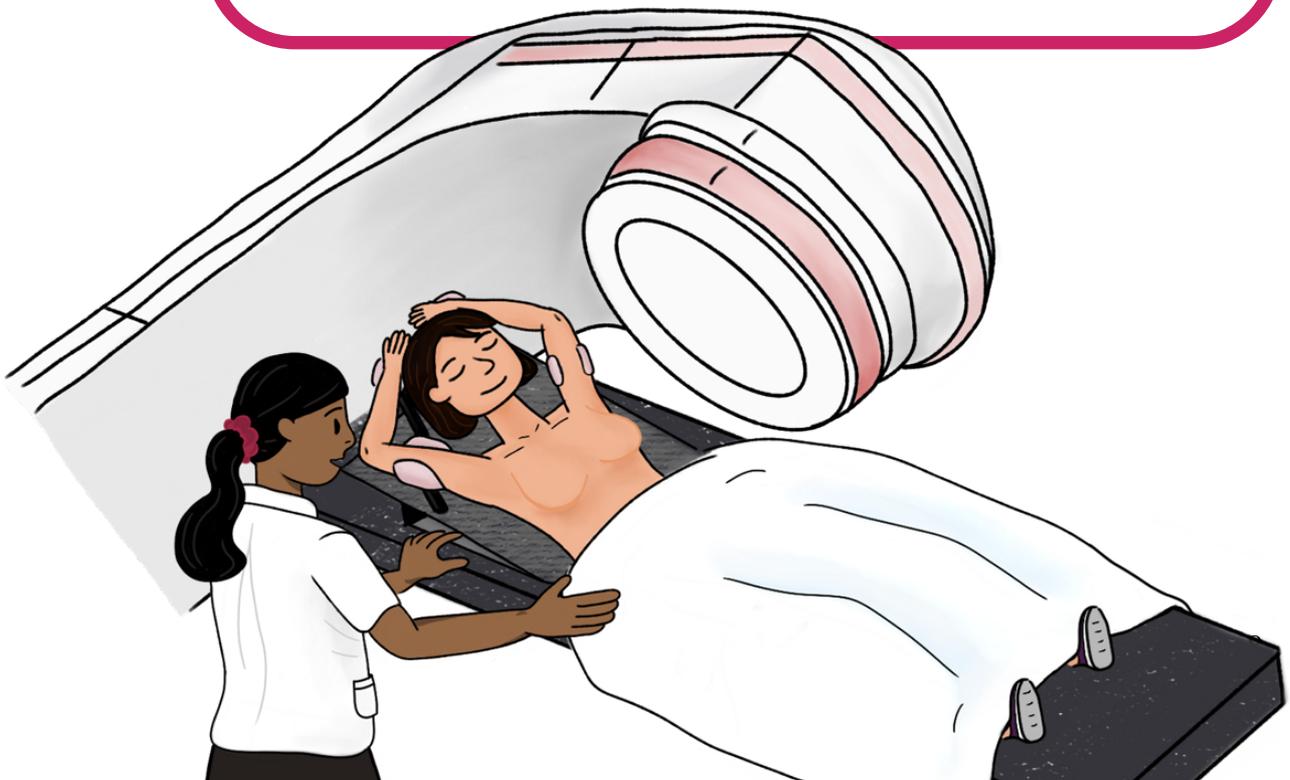
At the start of each session, the therapists will position you in the exact same position determined during your CT simulation. When your position is satisfactory, the therapists will leave the room.

### X-RAY IMAGING

X-rays will be taken regularly in the treatment room to monitor your position and treatment area.

### TREATMENT

- The machine will rotate around you a few times, giving off a beeping sound.
- You will not feel anything and the **whole process is painless**.
- You will be monitored by the therapists from the console area. If you require assistance, **wave your hand** to seek their attention.



## Treatment Schedule



**Monday to Friday** for **5 to 30 sessions** depending on your treatment regimen.



Allocate **30 - 60 minutes** for your radiotherapy appointments.



**Regular Routine Review** with your Radiation Oncologist to monitor your treatment progress and manage side effects effectively.

## 5. Post-Treatment Follow-up

You will receive a follow up appointment with your Radiation Oncologist after completing your course of radiation treatment. This appointment is usually scheduled around 2 - 6 weeks after your last day of treatment.

It is important to attend the follow up appointments for your doctor to review side effects that may not manifest until after the end of your treatment. You are also encouraged to continue with a yearly mammogram screening and perform regular self-examination of your breast to look out for signs of cancer return.

If you have any concerns or do not feel well in the interim, please make an earlier appointment with your Radiation Oncologist by calling the NCCS Call Centre at **6436 8088** or go to the Emergency Department if necessary.

# Treatment Side Effects

You may experience side effects that are generally limited to the area being treated. Side effects are described as 'early' or 'late'.

## Early Side Effects

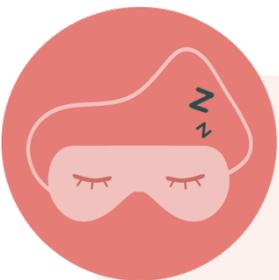
Early side effects can occur during radiotherapy, typically 2 weeks into the treatment. Such side effects are **usually temporary** and show gradual improvement in 8 weeks upon completion of treatment. However, some may take a longer time to resolve.



### SKIN CHANGES

#### TIPS:

- Wash treatment area gently with non-perfumed soap
- Use moisturiser approved by your doctor after daily treatment
- Avoid use of razor (i.e. underarms) to prevent cuts



### FATIGUE

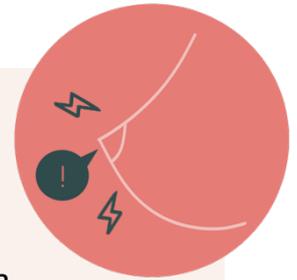
#### TIPS:

- Continue daily activities in moderation
- Get ample rest
- Engage in recommended exercises

## BREAST SWELLING & PRICKLY SENSATION

### TIPS:

Wear loose, comfortable clothing with unwired bra  
Tugging sensation is brief, allow rest



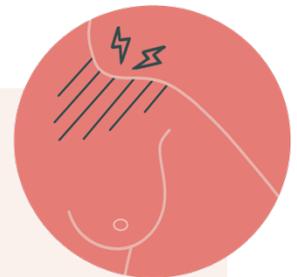
## STIFF SHOULDER

### TIPS:

Engage in arm exercises before and during your radiation treatment course

The exercises will help to :

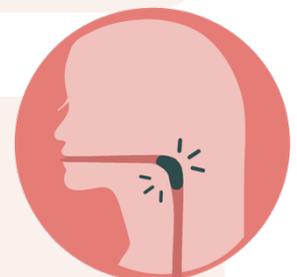
1. **Maintain your arm mobility** to achieve treatment position and to regain shoulder movements as you had before the surgery
2. **Relief tightness** under the arm pit
3. **Combat fatigue**



## SORE THROAT

### TIPS:

Drink more water  
Avoid spicy and fried food



## Late Side Effects

Late side effects are uncommon. They may occur only many months or years after treatment. Hence, it is important to follow up with your doctor after treatment.

Please seek immediate medical attention if you experience:

- Chest tightness or breathing difficulties
- Sharp pain or swelling over the treated side of the chest

If you are experiencing any of the symptoms above, it may indicate radiation pneumonitis or a rib fracture.

As each person's body and treatment is unique, the onset and severity of side effects can vary between patients.

Please approach your Radiation Oncologist or Radiation Therapist for more information and advice on treatment side effects.

# Supportive Care

The diagnosis of cancer is often unexpected, tough to accept, and difficult to cope with alone. This is why your team of doctors and healthcare professionals are here to support you through your whole cancer journey.

## Medical Social Service, Department of Psychosocial Oncology

Please speak to your doctor if you feel that you need additional support. Your doctor will be able to refer you to our team of Medical Social Workers at the Department of Psychosocial Oncology. Our team of qualified Clinical Psychologists and Counsellors are well placed to provide you with the emotional and/or practical support you need during this difficult time. You may also reach them at **6306 1777** or **[psychosocial@nccs.com.sg](mailto:psychosocial@nccs.com.sg)**.

## Cancer Helpline

If you prefer to speak to someone anonymously, you may contact our nurse counsellors via the NCCS Cancer Helpline. They can provide a listening ear and help to clarify any doubts and concerns. You may reach them at **6225 5655** or **[cancerhelpline@nccs.com.sg](mailto:cancerhelpline@nccs.com.sg)**.

Please be assured that your conversations will be kept private and confidential.



# Common questions

## **I am uncomfortable having male staff around. What should I do?**

We understand that undressing for treatment can be uncomfortable. The therapists will cover you as much as possible during treatment. A female staff will always be present in the presence of our male staff. Please speak to any of our staff if you find this arrangement uncomfortable.

## **Why does the treatment machine turn to the non-affected side during treatment?**

The treatment machine may turn to the non-affected side to deliver treatment at an angle that reduces dose to your vital organs (heart and lungs). The non-affected side will not receive any radiation as the area is shielded away.

## **Is it safe to be with children, pregnant women, or elderly?**

You will not be radioactive after treatment. Once the external beam therapy is stopped, there will not be any more radiation in your body. You can continue to have physical contact with your family and friends without any precautions.

## **I am a Muslim and my faith prohibits me from making any permanent markings on my body. Can I receive radiation treatment without these permanent markings?**

While we respect your religious views, permanent markings are necessary for treatment accuracy. Please speak to the radiation team who can refer you to the Letter of Guidance from MUIS regarding permanent markings for radiotherapy.

## **What is a seroma? How often do I need to go for fluid aspiration?**

Seroma is the collection of fluid where breast tissues had been surgically removed. If you are on regular follow-up with your Breast Care Nurse, you are encouraged to visit her to remove the fluid either on the day or one day before the CT simulation and the start of your radiation treatment.

# Useful Contact & Resources



**Appointment Scheduling :** 6436 8088

**General Enquiry:** 6436 8000

**Cancer Helpline:** 6225 5655

**Email:** [callcentre@nccs.com.sg](mailto:callcentre@nccs.com.sg)

## Internet Resources

**National Cancer Institute**  
[www.cancer.gov/cancertopics](http://www.cancer.gov/cancertopics)

**Macmillan Cancer Support**  
<https://www.macmillan.org.uk>

**American Cancer Society**  
[www.cancer.org](http://www.cancer.org)

**Singapore Cancer Society**  
[www.singaporecancersociety.org.sg](http://www.singaporecancersociety.org.sg)

**Breast Cancer Foundation Singapore**  
<https://www.bcf.org.sg>

## Scan for more information

Deep Inhalation  
Breath-hold



# BREAST CANCER RADIOTHERAPY SUMMARY

## 1. PREPARATION

### STRETCH IT OUT!

Engage in arm exercises recommended by  
SGH Occupational Therapy



## 2. CT SIMULATION



Your treatment position will be decided here!  
Feeling uncomfortable? Let your therapist know!

**STAY CALM & BREATHE NORMALLY**  
3 to 4 small semi-permanent markings  
will be made for treatment positioning.

## 3. TREATMENT

**Relax, Stay Calm & Breathe Normally**  
Let your therapist position you for treatment

Treatment is **PAINLESS & NO HEAT**  
**Wave your hand** if you need help



## 4. COMMON SIDE EFFECTS

You would expect some of these side effects **2 weeks** into treatment:  
Skin changes, Fatigue, Breast swelling,  
Stiff shoulder, Sore throat, Prickly Sensation

Something worrying you?

**ASK YOUR RADIATION THERAPY TEAM!**

For more information on cancer, please call the

Cancer Helpline at Tel: 6225 5655  
or email [cancerhelpline@nccs.com.sg](mailto:cancerhelpline@nccs.com.sg)

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Division of Radiation Oncology  
National Cancer Centre Singapore  
30 Hospital Boulevard  
Singapore 168583

Tel: 6436 8000 Fax: 6225 6283  
Website: [www.nccs.com.sg](http://www.nccs.com.sg)