PROCEDURE

Whole breast radiation therapy

Whole breast radiation therapy uses targeted high-energy beams to reduce breast cancer returning after surgery.

PURPOSE
Lower the chance of cancer returning in the treated breast

PROCEDURE TYPE
Therapeutic, non-invasive external beam treatment

WHERE IT IS DONE
Outpatient radiation therapy clinic

ANAESTHESIA
None

HOW LONG IT TAKES
10-30 minutes per session over one to several weeks

PREPARATION
Planning scan; usually no fasting or medicine changes

RECOVERY
Same day; driving usually allowed

MAIN RISKS
Skin reaction, fatigue, swelling, rare heart or lung injury

RESULTS
Treatment record immediate; follow-up assesses recurrence over time

Overview

Whole breast radiation therapy uses high-energy X-rays to treat the breast. It is most often given after breast-conserving surgery, also called a lumpectomy. That surgery removes the cancer while leaving most of the breast in place.

Radiation damages the DNA of cancer cells that may remain but are too small to see on scans. Healthy cells can also be affected, but they are usually better able to repair themselves.

Treatment is delivered by a machine called a linear accelerator. Nothing enters your body, and you do not become radioactive. You can safely be around other people after each session.

Whole breast radiation usually treats the remaining breast tissue. Treatment of nearby lymph nodes may be recommended separately based on the cancer and surgery findings.

Why the procedure is performed

The main goal is to lower the chance that breast cancer will return in the treated breast. Radiation can also reduce the chance of recurrence after surgery for ductal carcinoma in situ, or DCIS. DCIS means abnormal cells are contained inside the breast's milk ducts.

Whole breast radiation is usually considered after a lumpectomy for:

A focused extra dose, called a boost, may be given to the area where the tumour was removed. A boost can improve local control for some people, but it may add treatment sessions and increase breast firmness or skin changes.

- Invasive breast cancer
- DCIS
- More than one area of cancer within the removed breast tissue
- Cancer features suggesting that treating only part of the breast is unsuitable

Who should and should not have it

Whole breast radiation is suitable for many people who have had breast-conserving surgery. Whether it is right for you depends on the type and size of the cancer, surgical margins, lymph node findings, age, general health and your preferences.

It may be avoided, delayed or changed when:

Previous radiation or a connective tissue condition does not always rule treatment out. A radiation oncologist can assess your earlier treatment records and individual risks.

Some people with a low risk of recurrence may reasonably consider partial breast radiation or no radiation. This decision requires a careful discussion of the higher local recurrence risk traded for avoiding or shortening treatment.

- You are pregnant, because radiation can harm a developing baby
- The surgical wound has not healed or there is an active infection
- You previously received radiation to an overlapping breast or chest area
- You cannot safely lie in the required position
- The treatment area cannot be planned within safe limits for the heart, lungs or other organs

- You have certain connective tissue conditions, especially scleroderma, which can increase tissue reactions

How to prepare

Your treating facility's own instructions take priority because equipment and treatment plans differ.

You will first attend a planning appointment called simulation. A CT scan maps the breast and nearby organs while you lie in the treatment position. This is for planning rather than diagnosing cancer.

You may receive tiny permanent tattoo dots or longer-lasting skin marks to help staff position you accurately each day. Some centres use surface-guided cameras instead.

Before treatment:

Fasting is not normally needed. Blood thinners like warfarin or apixaban usually do not need to be stopped because radiation does not involve an incision.

For left-sided treatment, you may practise taking and holding a deep breath. This moves the heart farther from the breast and may reduce the amount of radiation reaching it.

- Tell the team if you are pregnant or could be pregnant
- Provide details of previous radiation treatment
- Ask whether to avoid deodorant, creams or powders before sessions
- Wear clothing that is easy to remove from the upper body
- Continue medicines unless your facility tells you otherwise

What happens during the procedure

A radiation therapist helps you lie on a firm treatment table, usually with both arms raised. Supports help you keep the same position used during planning.

The team checks your position using skin marks, cameras or imaging. They then leave the room but can see, hear and speak with you throughout treatment.

The machine moves around you without touching you. It delivers radiation from planned angles. You will not see or feel the radiation, although you may hear the machine.

You must remain still and may be asked to hold your breath for short periods. The radiation itself usually lasts only a few minutes, but positioning and safety checks make the appointment

longer.

Treatment is commonly given on weekdays. The number of sessions can range from several treatments to several weeks, depending on the prescribed schedule and whether you need a boost or lymph node treatment.

Recovery and what to expect afterward

Radiation does not usually cause pain during a session. Over the course of treatment, the breast may become tender, warm, itchy or swollen. Mild aching or brief shooting pains can occur.

You can usually eat and drink normally. Staying hydrated and eating enough protein and calories may help you manage fatigue and support skin healing.

Most people can continue ordinary light activity. Gentle movement may help with tiredness and shoulder stiffness. Avoid rubbing the treated skin, and follow your team's advice about swimming, sun exposure and high-impact exercise.

You can normally drive yourself to and from treatment because no anaesthetic or sedative is used. Do not drive if fatigue, pain, limited arm movement or another medicine makes driving unsafe.

Many people continue working, sometimes with reduced hours. Fatigue often builds gradually and may be strongest near the end of treatment or during the following weeks. Skin reactions can also worsen briefly after the last session before improving.

Risks and possible complications

Short-term effects are usually limited to the treated area. They may include:

Later changes can include a breast that is smaller, firmer or shaped differently. Small visible blood vessels or lasting colour changes may develop. Some people have ongoing tenderness.

Less common complications include arm or breast lymphoedema, which is swelling caused by fluid buildup, especially when lymph nodes are also treated. Rib weakness, lung inflammation and heart injury are uncommon but possible. Modern planning aims to limit radiation reaching the heart and lungs.

Radiation can very rarely cause a new cancer in the treated area years later. Your team should balance this long-term risk against the expected benefit of reducing breast cancer recurrence.

- Redness, darkening, dryness, itching or peeling of the skin
- Breast tenderness or swelling
- Fatigue
- Temporary loss of underarm or breast hair within the treatment field
- Throat discomfort if nearby lymph node areas are treated

Results and follow up

There is no immediate test result showing whether radiation worked. The full course is recorded as it is delivered, but its benefit is measured by lowering the chance of future recurrence.

Your skin and other side effects may be reviewed during treatment. A follow-up appointment is usually arranged after treatment to check healing and discuss ongoing symptoms.

You will continue breast cancer follow-up with physical examinations and mammograms. The first mammogram after breast-conserving treatment is often scheduled several months after radiation, commonly within 6 to 12 months. Your team will set the timing based on your surgery, treatment and local follow-up programme.

Contact the team between routine visits if you notice a new breast or underarm lump, persistent skin change, increasing swelling or another new concern.

Alternatives

The realistic alternatives depend on your cancer and whether surgery has already taken place.

Partial breast radiation treats only the area around the surgical cavity. It may require fewer sessions and exposes less normal tissue, but it is appropriate only for selected cancers. It does not treat possible cancer cells elsewhere in the breast.

Mastectomy removes the breast and may avoid whole breast radiation for some early cancers. It is a larger operation with a longer recovery, and radiation may still be needed if higher-risk features are found.

Omitting radiation avoids treatment visits and radiation side effects, but increases the chance of cancer returning in the same breast. It may be considered for selected people with a low-risk, hormone-sensitive cancer who will take endocrine therapy.

Endocrine therapy lowers the effect of hormones on hormone-sensitive cancer. It can reduce

recurrence risk but has its own side effects and is not generally a direct replacement for radiation.

Chemotherapy and targeted medicines treat cancer cells throughout the body. They may be recommended alongside radiation but do not usually provide the same local control within the breast.

When to call your healthcare team

Contact your radiation team promptly if you develop:

Seek emergency care for severe difficulty breathing, crushing or persistent chest pain, fainting, or signs of a serious allergic reaction. These are not expected routine effects and need immediate assessment.

Mild tiredness, gradual skin darkening and manageable tenderness can usually be discussed at your next scheduled treatment review. Contact the team sooner if you are unsure or symptoms are interfering with sleep, eating or daily activity.

- Blistering, moist peeling or an open area of treated skin
- Rapidly increasing redness, warmth, swelling or pain
- Fever or drainage that could suggest infection
- New or increasing arm, hand or breast swelling
- A persistent new cough or shortness of breath after treatment
- Pain that is not controlled by the plan your team provided

Common questions

Will I be asleep?

No. Whole breast radiation does not require anaesthesia or sedation. You are awake and can communicate with the radiation therapists throughout the session.

Can I drive myself home?

Usually, yes. Radiation does not make you radioactive or immediately impair alertness. Arrange help if fatigue, pain, restricted arm movement or other medicines affect safe driving.

How painful is it?

The radiation beam cannot be felt. Holding your arms up may be uncomfortable, and the breast

can become tender as treatment continues. Tell the team if positioning hurts because supports or adjustments may help.

When will I know if it worked?

There is no immediate result. Radiation is intended to reduce the chance of cancer returning over the years ahead. Follow-up examinations and mammograms monitor the treated breast.

Will I lose my hair?

You will not usually lose scalp hair from breast radiation. Hair may stop growing in the underarm or another area directly within the radiation field.

Am I radioactive afterward?

No. External beam radiation passes through your body and does not remain there. You can have normal contact with children, pregnant people and pets.

Sources

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