PROCEDURE

Partial breast radiation therapy - external beam

External beam partial breast radiation directs radiation at the area around a removed breast tumour to lower the chance of cancer returning there.

PURPOSE
Reduce breast cancer recurrence after breast-conserving surgery

PROCEDURE TYPE
Therapeutic - noninvasive external-beam radiation

WHERE IT IS DONE
Outpatient radiation therapy clinic

ANAESTHESIA
None

HOW LONG IT TAKES
10 to 30 minutes per session

PREPARATION
Planning CT scan; no routine fasting or bowel preparation

RECOVERY
Same day; drive unless medicines or symptoms make it unsafe

MAIN RISKS
Skin reaction, fatigue, breast swelling, long-term firmness

RESULTS
Cancer control assessed over years with exams and mammograms

Overview

Partial breast radiation therapy uses high-energy X-rays to treat part of the breast. The radiation comes from a machine outside your body, usually a linear accelerator.

Treatment is directed at the area where a breast tumour was removed, called the lumpectomy cavity, and a small margin of surrounding tissue. This is where a cancer is most likely to return within the breast.

Partial breast radiation treats less breast tissue than whole-breast radiation. It is often delivered over fewer treatment sessions, which is why it may be called accelerated partial breast irradiation.

Radiation does not remove tissue or provide an immediate test result. Its purpose is to damage

cancer cells that may remain after surgery while limiting radiation exposure to nearby healthy tissue.

Why the procedure is performed

External beam partial breast radiation is usually offered after breast-conserving surgery, also called a lumpectomy. It lowers the chance that cancer will return in or near the treated area.

It may be used for selected people with early-stage invasive breast cancer or ductal carcinoma in situ, known as DCIS. DCIS means abnormal cells are contained within the breast ducts and have not invaded nearby breast tissue.

Partial breast treatment may offer:

Radiation is local treatment. Hormone therapy, chemotherapy and targeted medicines work differently and may still be recommended based on the cancer's features.

- A smaller treatment area than whole-breast radiation
- Fewer visits for some treatment schedules
- Less radiation to parts of the heart, lungs and untreated breast

Who should and should not have it

Partial breast radiation is not suitable for everyone. It is most often considered when the cancer was small, removed with clear surgical margins and has not spread to lymph nodes. Your age, tumour type, hormone receptor status, location and breast anatomy also affect the decision.

Whole-breast radiation may be more appropriate if there are several areas of cancer, cancer cells at the surgical edge, involved lymph nodes or features linked with a greater risk of cancer elsewhere in the breast. Radiation to regional lymph nodes cannot usually be replaced by partial breast treatment.

Treatment may be avoided or delayed if:

Tell the radiation team if you have a pacemaker or other implanted electronic device. It does not always prevent treatment, but the device may need special planning and monitoring.

Your team should explain why partial breast radiation is being recommended and how your pathology results affect that choice.

- Your surgical wound has not healed or there is an active infection

- You are pregnant
- The required area overlaps substantially with previous radiation
- You cannot safely maintain the treatment position
- Treatment planning cannot protect nearby organs adequately

How to prepare

The treating facility's own instructions take priority. Contact the facility if anything in its instructions is unclear.

Before treatment, you will attend a planning appointment called a simulation. You will usually lie on your back with one or both arms raised. A support device may help you remain in the same position each day.

A CT scan maps the breast, lumpectomy area, heart and lungs. Small skin marks or tiny permanent tattoo dots may be used for positioning. Some centres use surface-guided cameras instead.

For a left-sided breast cancer, you may practise holding a deep breath for short periods. This can move the heart farther from the treatment area.

You can usually eat normally and take your usual medicines. Fasting and bowel preparation are not normally required. Do not stop blood thinners or other prescribed medicines unless your treating team specifically tells you to.

Tell the team if you could be pregnant. Ask before applying deodorant, moisturiser or other skin products immediately before a session, because local instructions differ.

What happens during the procedure

At each session, a radiation therapist helps you into the planned position. The team may take X-ray or CT images to confirm that your body and the treatment area are aligned correctly.

The therapists then leave the room and operate the machine from nearby. They can see and hear you throughout the session. The machine may rotate around you and make clicking, humming or buzzing sounds. It does not usually touch you.

You must remain still, but you can breathe normally unless you are using a breath-hold technique. The radiation itself cannot be seen or felt.

Most appointments take about 10 to 30 minutes, although the radiation beam is on for only

part of that time. Your course may contain five or more sessions given on consecutive or alternating weekdays. Some schedules use twice-daily treatment. Your radiation oncologist will explain the schedule selected for you.

External beam treatment does not make you radioactive. It is safe to be around other people afterward.

Recovery and what to expect afterward

Pain: The session itself should not hurt. Over the course of treatment, the breast may become tender, warm, swollen or sensitive. Mild shooting pains can occur. Ask your team which pain relief and skin products are appropriate.

Eating: You can eat and drink normally unless another medical condition or treatment requires restrictions. Staying hydrated and eating regular meals may help if you feel tired.

Activity: You can usually continue normal daily activities. Gentle shoulder movement may reduce stiffness after surgery and radiation. Avoid rubbing irritated skin, and protect the treated area from sun exposure. Adjust exercise if breast discomfort or fatigue increases.

Driving: Because no anaesthetic or sedation is normally used, most people can drive after treatment. Do not drive if pain, fatigue, limited arm movement or a medicine affects your ability to control the vehicle safely.

Work: Many people continue working during treatment. Others need shorter hours or time off because of appointments, fatigue or skin discomfort. These effects may become more noticeable near the end of treatment and for a short time afterward.

Risks and possible complications

Short-term effects are usually limited to the treated breast and nearby skin. They can include redness or darkening, dryness, itching, tenderness, swelling and fatigue. Skin peeling or blistering is less common but requires advice from the treatment team.

Possible later effects include:

Modern planning is designed to limit radiation to the heart, lungs, ribs and healthy breast. The exact risks depend on the treatment area, dose, technique and your health.

- Persistent breast firmness, swelling or changes in size or shape
- Visible small blood vessels or changes in skin colour

- Fat damage that forms a firm lump, called fat necrosis
- Rib tenderness or, rarely, a rib fracture
- Lung inflammation causing cough or breathlessness
- Heart effects when the heart receives radiation exposure
- Arm swelling if lymph drainage is affected
- A very small risk of another cancer developing in treated tissue

Results and follow up

There is no immediate result showing whether radiation has worked. Its benefit is measured by whether cancer remains controlled over the following years.

You will have routine follow-up appointments to review skin healing, breast changes, medicines and any ongoing symptoms. The treated area can feel firm or look different as it heals, and these changes do not by themselves show whether cancer has returned.

Follow-up mammography is often arranged about 6 to 12 months after radiation, then at regular intervals based on your care plan. Early images can show treatment-related changes, so comparison with later mammograms is helpful.

Keep attending routine breast cancer follow-up even if you feel well. Report a new or enlarging breast or underarm lump rather than waiting for the next scheduled visit.

Alternatives

The main alternative is whole-breast radiation. It treats the entire breast and may also include nearby lymph node areas. It exposes more breast tissue and may require a different schedule, but it is more appropriate when the risk is not limited to the lumpectomy area.

Other options include:

Hormone therapy, chemotherapy and targeted therapy are generally not direct substitutes for radiation because they address different risks.

- No radiation: This avoids treatment visits and radiation effects but increases the chance of cancer returning in the breast. It may be considered for carefully selected people with a low-risk, hormone-sensitive cancer who will take hormone therapy.

- Mastectomy: Removing the breast provides wider local treatment but is a larger operation with a longer recovery. Radiation can still be needed if higher-risk features are found.
- Breast brachytherapy: A radioactive source is placed temporarily inside or close to the lumpectomy cavity. It treats a small area but requires an invasive applicator and is not offered everywhere.
- Radiation during surgery: Intraoperative radiation gives a concentrated treatment while the lumpectomy is performed. It is convenient, but some people need additional radiation afterward, and local recurrence can be higher with certain techniques.
- Whole-breast radiation with a shorter schedule: This treats more tissue than partial breast radiation but may still be completed in relatively few visits.

When to call your healthcare team

Mild tiredness, breast tenderness and gradual skin colour changes can usually be discussed at a treatment visit. Contact the team promptly if you develop:

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

- Blistering, open skin or drainage from the treated area
- Fever with increasing breast redness, warmth or swelling
- Pain that is severe or not controlled by recommended treatment
- New marked swelling of the breast, arm or hand
- A new cough or shortness of breath
- A new or enlarging breast or underarm lump

Common questions

Will I be asleep?

No. External beam partial breast radiation does not normally require anaesthesia or sedation. You will be awake and must remain still during treatment.

Can I drive myself home?

Usually, yes. Do not drive if fatigue, pain, restricted arm movement or medication makes driving unsafe.

How painful is it?

You should not feel the radiation beam. Breast tenderness and skin irritation can develop gradually during the treatment course and shortly afterward.

When will I know if it worked?

There is no immediate test result. Your team assesses long-term cancer control through breast examinations, mammograms and follow-up over time.

Will I be radioactive afterward?

No. The machine directs radiation at you only while it is switched on. No radioactive material remains in your body.

Why am I having only part of my breast treated?

Your team may consider the risk to be concentrated around the area where the tumour was removed. Partial treatment aims to protect that area while limiting radiation to healthy tissue.

Sources

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