

It's MY lifetime



**Get to know and understand
intraoperative radiotherapy
for breast cancer**

zeiss.com



Seeing beyond



Individualized breast cancer care

The importance of personalized breast cancer treatment

Breast cancer (mammary carcinoma) is the most common form of cancer in women and also affects men in 0.5 to 1% of cases.

Today, if breast cancer is diagnosed at an early stage, the outlook for the treatment is usually very good. The availability of a range of treatments provides doctors with a broad spectrum of treatment options that can be optimally tailored to the individual patients and the tumor.

Modern radiotherapy for breast cancer in particular offers a variety of technologies – from radioactive solutions (e.g. rice-sized radioactive metal beads called seeds that are injected directly into the tumor tissue or liquids) to non-radioactive solutions (e.g. electron- and photon-based radiation therapy) – that allow doctors and patients to determine the best course of

treatment for each individual, taking the patient's needs into account.

Whether a certain form of radiation therapy is suitable for you depends on a range of factors.

Talk to your doctor to learn about your therapy options.



Steps in the treatment of breast cancer

From diagnosis to follow-up care



Diagnosis

A diagnosis of breast cancer is always unsettling and raises a host of questions that you should talk to your doctor about: What are the next steps, what are my treatment options, and how will this diagnosis affect my life and the lives of my loved ones?



Treatment plan

Depending on your personal situation, the particulars of the tumor, and the time at which the tumor was discovered, a team of breast care experts will develop a personalized treatment plan for you.

There may be a number of options that are clinically appropriate for you. In this case, you can choose your preferred course of treatment in consultation with your doctor.



Choosing a treatment

The treatment options and combinations of treatments that are possible and appropriate in your case depend on a variety of criteria that you should discuss in detail with your doctor. However, all breast cancer patients need to have the tumor surgically removed. There are two kinds of surgery:

- **mastectomy:** removal of the whole breast
- **partial mastectomy/lumpectomy:** removal of the tumor along with a small amount of healthy breast tissue.

Before and/or after surgery medical treatment (also called systemic therapy) is often added to the treatment plan. This can include:

- **chemotherapy:** intravenous or oral anti-cancer drugs
- **hormone therapy:** drugs to reduce estrogen-levels
- **immunotherapy:** medication to activate the immune system to detect and kill cancer cells.

Before, during or after surgery radiotherapy as external or internal beam radiation is often used to kill remaining cancer cells.



Treatment

The length of the overall treatment depends on the therapy you have chosen.

Radiotherapy treatment generally takes anywhere from a few weeks to several months. In the best case, the length of treatment can be shortened from about six weeks (conventional external beam radiation therapy) to a single day (intraoperative radiation therapy).

Regardless of the type of treatment you receive, make sure you take enough time to rest. Breast cancer treatment can be an emotionally and physically demanding process for you and your loved ones.



Follow-up care

For many patients, treatment does not end with the completion of chemotherapy and/or radiation. Especially in the case of metastatic breast cancer, additional treatments may follow.

After treatment, you should visit your doctor for regular check-ups to closely monitor the results of your treatment and progress of recovery.

In addition to physical check-ups by your doctor, other measures such as annual mammography screenings and breast ultrasound examinations are performed according to your doctor's recommendation.

In many cases, concerns about medium- and long-term side effects such as skin irritation or cardiovascular disease are unfounded. If you are still uncertain or have already detected changes to your body, talk to your doctor.

Some patients also find it very helpful to talk about their illness and treatment experiences with family members, friends, or self-help groups.



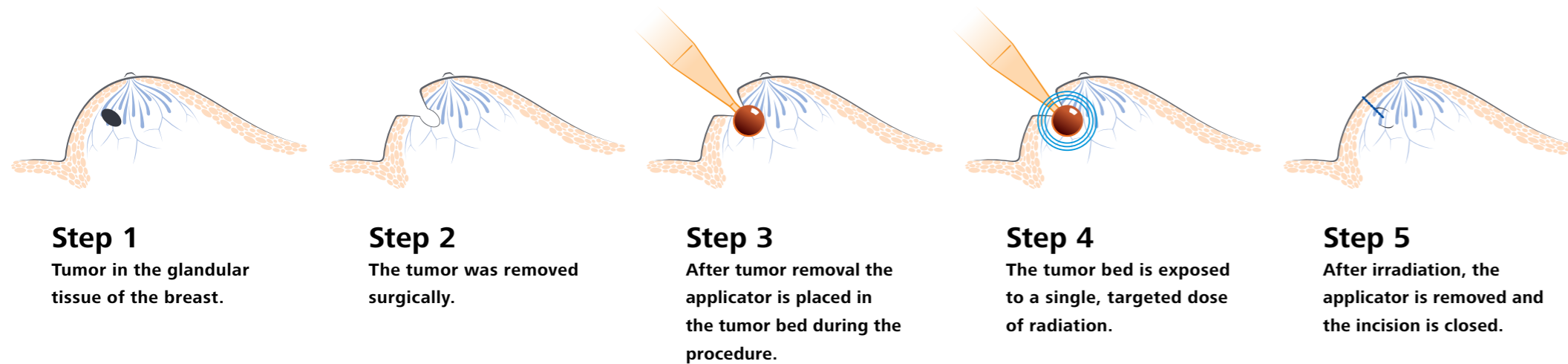
What is intraoperative radiation therapy?

Understanding radiation treatment options for breast cancer

When it comes to intraoperative radiation therapy (IORT), there are a variety of radioactive and non-radioactive methods. One of the latest methods is photon-based IORT, which has been in use worldwide for 25 years. This method achieves excellent results, especially for breast cancer. It is used instead of or in addition to external beam radiation therapy (EBRT), i.e. radiation of the entire chest from the outside.

At a glance

- precise, targeted single dose which is injected directly into the tumor bed after tumor removal in low risk patients
- local, high-dose radiation of the target tissue with photons whose radiation decays rapidly
- can be used as a standalone treatment (IORT only; in low risk patients only) or in combination (IORT + EBRT) to reduce journeys for treatment of external beam radiation therapy



Intraoperative radiation therapy (IORT) vs. external beam radiation therapy (EBRT)

A comparison of different radiation treatments

	Surgery	Intraoperative radiation	Postoperative recovery	External radiation
Only IORT	Tumor removal	Single dose	Healing of incision	
IORT + EBRT	Tumor removal	Single dose	Healing of incision	Postoperative radiation
Only EBRT	Tumor removal		Healing of incision	Postoperative radiation
Treatment time	1-2 hours	~30 minutes	4 weeks	3-6 weeks
Steps	Phase 1		Phase 2	Phase 3



Depending on the type of tumor and treatment plan, IORT can be used as a standalone treatment (low risk patients) or in combination with EBRT.



Advantages of intraoperative radiation therapy

Effects compared to conventional therapy



Can reduce radiation necrosis on risk areas, aiming to preserve healthy tissue and organs close to the breast.



Helps to reduce total treatment costs.



Can cause less radiation-induced side effects, less pain and better cosmetic outcomes. However, surgery is still likely to leave a scar.



Shorter treatment courses reduce the number of trips for the patient to the radiotherapy center leading to less CO2 emission.



Offers shorter treatment courses.

Frequently asked questions

How does intraoperative radiation therapy affect the healthy tissue and organs around my breast?

Due to the steep radiation dose fall-off, local IORT is minimizing the risk of damaging surrounding organs or healthy tissue.

Will I be radioactive during or after intraoperative radiation therapy or pose a risk to others?

No. Photon- and electron-based IORT does not use any radioactive material; instead, this treatment relies on electromagnetic waves, i.e. quickly moving electrons or photons. The moment the treatment devices are turned off, no more radiation is released around the device or in the patient's body.

Will I experience any pain or discomfort during intraoperative radiation therapy?

Since intraoperative radiation therapy is performed under anesthesia, the patient does not feel the radiation itself. However, since radiation does affect the tissue, patients may feel something like sunburn following therapy. Compared to EBRT, IORT can cause less radiation-induced side effects, less pain and better cosmetic outcomes for breast cancer patients.

Will I need additional radiation therapy treatments after IORT?

This depends on the IORT treatment your doctor prescribes. In the case of single-dose IORT, no additional radiation therapy is required. In the case of boost IORT, additional EBRT radiation therapy sessions are required, but still fewer than in the case for EBRT treatment alone.

What is boost radiation?

Boost radiation means that the tumor bed is exposed to a local, precise single higher dose of radiation in addition to external beam radiation therapy (EBRT). Intraoperative radiation therapy (IORT) can be performed as a single treatment (low risk patients) or as a boost. This is decided in consultation with the treating doctor.



Clinics in your area that offer intraoperative radiotherapy

Scan the QR code to learn more!



www.zeiss.ly/clinic-finder

This brochure was developed with the support of breast cancer patients and experts.

This brochure is intended to provide basic information only. It is not intended to provide medical advice and is not a substitute for medical consultation, where you will be informed of the potential risks, side effects, and limitations of intraoperative radiation therapy.

Carl Zeiss Meditec AG
Goeschwitzer Strasse 51–52
07745 Jena
Germany



Seeing beyond