

Appendix 1

Questions and answers on radiation therapy after lumpectomy

A guide for women and their physicians

What is a lumpectomy?

A *lumpectomy* is an operation that removes a breast cancer growth or *tumour* along with a “shell” of normal tissue to ensure that the whole tumour is taken. Because most of the breast remains in place, lumpectomy is often called *breast-conserving surgery (BCS)*. Until a few years ago, women with breast cancer almost always had a *mastectomy* — an operation to remove the whole breast. Lumpectomy is a less radical operation that removes only the diseased part of the breast and leaves healthy breast tissue in place. Studies have shown that women who have a lumpectomy followed by radiation treatment live just as long as women who have a mastectomy (see [patient guide to guideline 3](#)). Four out of 5 women with breast cancer have tumours that can be treated by lumpectomy.

What is radiation therapy?

Radiation therapy (also called *radiotherapy*) is the use of high-energy x-rays to kill cancer cells.

Will I need radiation therapy if I have a lumpectomy?

Yes, radiation therapy is almost always recommended after lumpectomy. Cancer can return in the same breast after surgery (*local recurrence*). Studies have shown that radiation therapy significantly reduces the risk of local recurrence. Although there are no guarantees, the benefits of radiation therapy are so great that you should definitely consider it as part of your treatment. Keep in mind that more than 90% of women are satisfied with the appearance of the breast after lumpectomy and radiation treatment.

My doctor says my cancer is not likely to return because I am over 50 years old and my tumour was very small. Should I still consider radiation therapy?

Although it is true that your risk of recurrence is relatively low, about 1 in 10 women over age 50 with small tumours will have a recurrence of cancer within 8 years if they have a lumpectomy *without* radiation therapy. Radiation therapy can reduce this risk to about 1 in 50 women and provide an extra margin of safety. Some women with early breast cancer will take tamoxifen after surgery (see [patient guides to guidelines 7 and 8](#)). Radiation therapy can help these women as well, and they should not avoid radiation therapy just because they are taking tamoxifen.

Does radiation therapy have unpleasant or dangerous side effects?

Radiation therapy can have side effects that occur both during and after the treatment. In the first weeks after radiation therapy starts, you may notice the skin in the breast area reddening or swelling and you may feel very tired. These problems usually disappear within 3 to 6 months. In the first 5 years after treatment, you may experience discomfort, pain, swelling, discolouration or other skin changes in the breast area. As well, some breast tissue may shrink or become hard when fat cells die, especially in areas that receive high-dose treatments. This hardening does not mean that the cancer has come back.

With current radiation therapy techniques, severe long-term side effects are rare. Even in the past, when radiation therapy involved different techniques and higher doses of radiation than would be recommended today, serious problems occurred in less than 1% of patients treated.

Can the radiation cause cancer?

Any danger from radiation depends on the type of radiation, the amount given and the way it is applied. There is no convincing evidence that the kind of radiation therapy given after lumpectomy can cause cancer, either in the breast or elsewhere in the body.

Tissue was removed from one small area of my breast, but my doctor wants to treat the whole breast with radiation. Is this a good idea?

There is clear evidence that radiation treatment of the whole breast prevents recurrence more effectively than radiation treatment of part of the breast.

What is a boost?

A *boost* is an extra dose of radiation given directly to the small area where the cancer was removed. Most often it is used when the tissue removed is examined under a microscope and cancer cells are found in the area surrounding the tumour. This indicates that all cancer cells were probably not taken out during the lumpectomy. Normally, a second operation to remove the remaining cancer is the best choice. However, if this is not possible for some reason, or if you decide against having more surgery, a boost of radiation to the area can be the “next-best” option. Recent research indicates that boost irradiation can reduce the risk of local recurrence of breast cancer, but it can also lead to poorer cosmetic results than would be achieved with no boost. Your doctor may ask you to consider a boost following breast radiation therapy when there is a high risk of local recurrence (for example, if you are less than 40 years of age or if cancer cells were found in the tissue bordering your tumour).

How is radiation therapy given?

Radiation therapy is not given all at once. It is divided into *fractions* — small doses — and is usually given 5 days a week for 3 to 6 weeks. If boosts are given, they are also divided into fractions.

Is there a “best” treatment schedule or a “right” dose of radiation?

A number of treatment schedules have been used, and study results suggest that they all produce similar benefits. Because all of these schedules are acceptable, it may be possible to choose the treatment program that best suits your timetable. However, it is important to stay within a standard range. Unusually high doses of radiation can cause more severe side effects without providing any extra benefit. Results of a recent Canadian study have shown that a schedule of treatments given over 22 days is as good as one given over 35 days.

When should radiation therapy begin?

- *If you are not having chemotherapy (treatment with anticancer drugs):* Radiation treatment should begin as soon as possible after your lumpectomy incision heals, usually within 8 weeks after surgery. It is generally believed that radiation therapy should not be delayed longer than 12 weeks after surgery, although there is no proof to support this.

- *If you are having chemotherapy:* Radiation treatment should be delayed until your chemotherapy is finished. Sometimes both kinds of treatment are given together. However, there is no evidence that this combination treatment improves the outcome, and it can increase the risk of unwanted side effects, especially if Adriamycin or other anthracycline-containing drugs are used as part of your chemotherapy.

Should some women *not* receive radiation therapy after lumpectomy?

Women who are pregnant or who have had previous high-dose radiation therapy to the chest (including radiation therapy for Hodgkin's disease) should definitely not receive radiation therapy.

Women with heart or lung disease, systemic lupus erythematosus or scleroderma should probably not have radiation therapy because of their increased risk of severe side effects from radiation treatments. Women with arthritis and other conditions that make it hard to lie flat or to stretch out the arm on the same side as the breast being treated may find it difficult or impossible to receive radiation treatments.