

Breast Cancer: Neoadjuvant Chemotherapy¹

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This is the third in a 12-part series on breast cancer. To view the rest of the titles in this series, [click here](#).

Neoadjuvant, or preoperative, chemotherapy is the use of chemotherapy to treat breast cancer before surgery. If your doctors have suggested that you consider this treatment, you probably have questions about it. This document was written to provide answers to some of your questions. Breast cancer recurrence and survival are the same whether the chemotherapy is given before or after surgery.

Overview of Chemotherapy Treatment

Chemotherapy is treatment that infuses drugs into your body to kill rapidly growing cells such as cancer cells. Chemotherapy can be given in several ways, but for most breast cancers it is given intravenously. The type of medicine given depends on your cancer and your health; the frequency of administration will depend on the type of drug. In chemotherapy used to treat breast cancer neoadjuvantly, common programs involve two to three drugs given every one, two, or three weeks for a total of three to four months. Depending on the chemotherapy regimen chosen for you, your doctor may recommend placement of a chemotherapy port in your upper chest before your treatment starts. The *port* is a small device implanted under your skin, which makes infusing chemotherapy drugs easier. Also, you can have blood drawn from the port, without the need to insert

a needle into a vein in your arm or hand. The port will be removed after you complete chemotherapy.

Each cycle begins with your chemotherapy infusion, which takes about two to six hours. Medicines to prevent nausea (*antiemetics*), allergic reactions, or other problems are given at this time. This is an outpatient procedure and does not require admission to a hospital. Getting the chemotherapy drugs does not hurt.

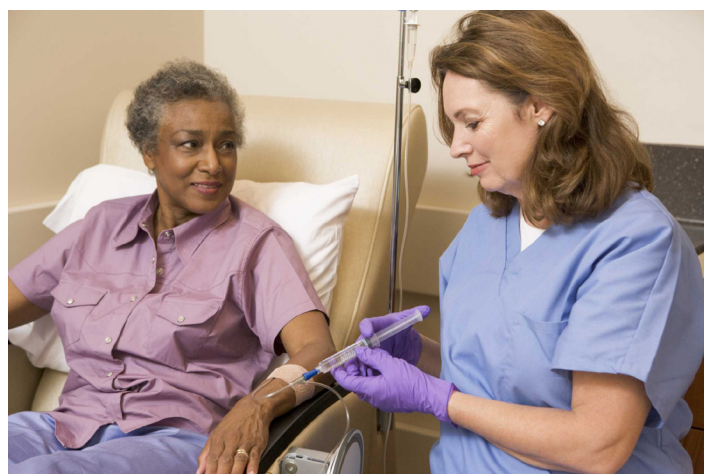


Figure 1. Chemotherapy for breast cancer is an outpatient procedure and may take two to six hours.
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Everyone reacts differently to treatment, so be sure to keep your physician informed about any adverse reactions that you may have. There are several American Cancer Society and National Cancer Institute publications about

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chemotherapy that are quite helpful. Your treatment center may provide copies of some of these before you start your treatment, or you can obtain them from your local American Cancer Society (<http://www.cancer.org/>) office.

Potential Side Effects of Chemotherapy

The side effects of chemotherapy vary by regimen and by individual patient experience. This document will discuss some of the most common side effects to help you prepare.

One common side effect is nausea. You will be sent home with a prescription for medication to help reduce nausea following treatment. You should not experience vomiting, but may lose your appetite or notice changes in how foods taste. It is important to remain well hydrated by drinking fluids, even if you do not feel like eating as you normally would.

Alopecia, or hair loss, occurs with most chemotherapy regimens used for the treatment of breast cancer. Many health insurers will cover the cost of a wig. Some women have used “cold caps” to reduce hair loss. Others wear beautiful head scarves. Hair does regrow after chemotherapy, but may be a different color or texture.



Figure 2. Hair loss is a side effect of certain chemotherapy drugs used to treat breast cancer. After treatment, hair will grow back, sometimes with a new texture or look.

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You may experience tingling sensations or numbness in your fingers and/or toes. This is called *neuropathy* and occurs because your nerves are affected by chemotherapy. This is one of the common side effects of many

chemotherapy agents. Neuropathy commonly improves when the chemotherapy is stopped.

Blood cell production is reduced during chemotherapy because the bone marrow’s activity is suppressed. This makes you more susceptible to serious infection when your white blood cell count is decreased. It is important to be careful to wash your hands. If you feel sick, check your temperature and notify your physician immediately if you have a fever. Some women receive injections that stimulate the bone marrow to make more blood cells. Most women do not require a blood transfusion.

Many people report slight changes in their ability to think and remember during chemotherapy. They may refer to this as “chemo brain,” and the cause is not well understood. Family members and friends may not notice differences, but those receiving chemotherapy often recognize that their thinking power is diminished. It may be difficult to do several things at once, perform higher-order thinking skills, or remember recent information. It is not known if these problems result from the effects of chemotherapy, the stress of having breast cancer, or a combination of factors. Generally, these changes resolve within six months to a year after completing chemotherapy. Research shows that taking the time to engage in the things you enjoy that do not require much attention—such as gardening, taking a walk in the woods, watching birds outside your window, or doing handicrafts—can help restore mental capacities.

Since everyone responds differently to chemotherapy, it is not possible to predict exactly how you will feel and what you will experience. Most patients feel ill for a few days (as if they had the flu) and then slowly recover over the next few days. By the week before the next cycle of chemotherapy, most women feel close to normal. You may want to reduce your workload by taking a leave or partial leave from work if possible. We recommend that you plan to get help from your family, friends, your place of worship, or someone hired to help you with household chores, child care, and other tasks. Making contact with a social worker associated with your cancer care team can be very helpful if difficulties arise, such as paying for your medications or transportation issues.

There is a great deal of evidence that indicates that women with breast cancer benefit from exercise. Gentle exercise, such as walking, for thirty minutes most days has been shown to help patients better tolerate chemotherapy treatments. Exercise is also associated with reduced recurrence of breast cancer.

Any of the symptoms mentioned above can be mild or severe. They could require additional medication and may even necessitate a hospital stay if severe enough. It is important to monitor your progress and keep in touch with the physician or other health care provider associated with your treatment.

Major Benefits of Neoadjuvant Chemotherapy

Having chemotherapy before surgery offers two main benefits. It is up to you to decide how much you value these benefits and what they would mean in your particular situation.

1. Neoadjuvant chemotherapy is most often done to reduce the size of the cancer. A smaller tumor may make the surgery easier. Having chemotherapy first in order to shrink the tumor enables more women to have the surgical option of breast preservation/conservation surgery. This is called *partial mastectomy* or *lumpectomy* and means that only the tumor will be removed. In contrast, removing the whole breast is called *mastectomy*. Keeping more of your breast means retaining much of your shape and the sensation of touch; reconstructive plastic surgery generally is not necessary, but radiation therapy usually is. This option is not available to every patient; it depends on the location and size of the tumor. Many women choose neoadjuvant chemotherapy prior to surgery to make the option of a lumpectomy possible.
2. Neoadjuvant chemotherapy can also tell you and your doctors whether your cancer is sensitive to the particular combination of drugs that you receive. If the tumor shrinks, it is responding to the drugs. If you do not choose neoadjuvant chemotherapy, there is no good way to know which chemotherapy drugs will work after the tumor is removed. Any possible remaining cells are usually microscopic, and there is no test that can tell if these cancer cells are sensitive to the chemotherapy used after surgery. Pursuing chemotherapy with the tumor present means the tumor can be measured by physical exams, mammography, or MRI (magnetic resonance imagery) to compare its size before and after treatment. The response to chemotherapy in the neoadjuvant setting is most important in ER-negative cancers, which are usually more sensitive to chemotherapy; if complete disappearance of the primary tumor is observed, it usually indicates good prognosis. Women who are interested in

obtaining the most information about their disease may find this benefit important as they make sense out of their treatment. The psychological benefit of knowing that the drugs are working and the tumor is shrinking is incredibly powerful and may make future treatments more tolerable. If the finding is that the drugs did not work, the doctors have the option of changing the chemotherapy drugs or proceeding directly to surgery. Women who do not opt for neoadjuvant chemotherapy receive similar chemotherapy treatments, but they will not know how sensitive their cancer is to the treatments used.

More Information to Consider

Starting your treatment with chemotherapy gives you time to learn about your disease and the treatments to come. If you like to research options before making a decision, choosing neoadjuvant chemotherapy allows you time to investigate presurgery genetic testing along with surgical and reconstruction options.

Neoadjuvant chemotherapy does not increase the length of time for your treatment; it only changes the order of treatments you might have expected if you thought surgery would be first. It also means you are living with the tumor for a few months before surgery. Some women are not pleased with this idea, while others benefit from having a focal point for their imagery and meditation techniques.

Summary

You are embarking on an extended medical odyssey. Some women find it helpful to gather information, research options, read the literature, ask questions, and play an active role in the decision making. The more proactive they are with their treatment, the better they feel about their care. There are many books and articles available to assist you, such as *Dr. Susan Love's Breast Book*. Other women find the whole process so overwhelming that they just want to have someone tell them what to do. These women especially need to have caring people with them as they make decisions about their treatment.

Both reactions are normal and acceptable. You need to follow your instincts and do what makes you most comfortable.

Choosing whether to use neoadjuvant chemotherapy is one of the first of many decisions you will make. Your doctors will give you medical advice, and that may help you decide. In some cases, however, the medical advice may not

clearly favor one treatment over another if survival rates are similar. In such cases, you will need to determine what is important to you—having surgery right away to remove the tumor, or starting chemotherapy first (allowing you to gather information about the sensitivity of the tumor to the drugs and to use the time to prepare for surgery). In both cases you are taking steps to regain your health and remove cancer. There usually isn't a wrong answer, but you may need to make your decision within a short timeframe. So, ask yourself, "Which feels best for me?"