

Neoadjuvant Therapy

Neoadjuvant therapy refers to any treatment that is given for cancer *before* the main treatment, with the goal of making the main treatment more likely to be successful.

What Is Neoadjuvant Therapy?

In most cancers, the primary, definitive treatment is either surgery to remove the tumor or radiation therapy to kill the tumor cells. Sometimes, extra treatment, such as chemotherapy or hormone therapy, is used either before or after the primary therapy. Extra treatment given *after* primary therapy is referred to as **adjuvant** (meaning "helper") **therapy**, whereas extra treatment given *before* primary therapy is referred to as **neoadjuvant therapy**.

This general concept of **multimodality treatment** (the use of more than 1 method to treat cancer) is often used in cancers such as breast, colon, or lung cancers. Using adjuvant or neoadjuvant therapy may improve the probability of cure.

Why Is Neoadjuvant Therapy Beneficial?

The basic concept of either neoadjuvant or adjuvant therapy is that a systemic therapy that affects the whole body, such as chemotherapy, hormone therapy, or a targeted agent, may reach cancer cells in the circulation or distant tissues that are not seen on scans or by a surgeon. These "micrometastases" have the potential to grow into visible, recurrent cancer if left untreated because they were impossible to detect earlier. In some cases, radiation therapy may also be used as neoadjuvant therapy to provide additional tumor shrinkage prior to surgery.

When Is Neoadjuvant Therapy Used?

There are several reasons to use systemic neoadjuvant therapy before local definitive therapy:

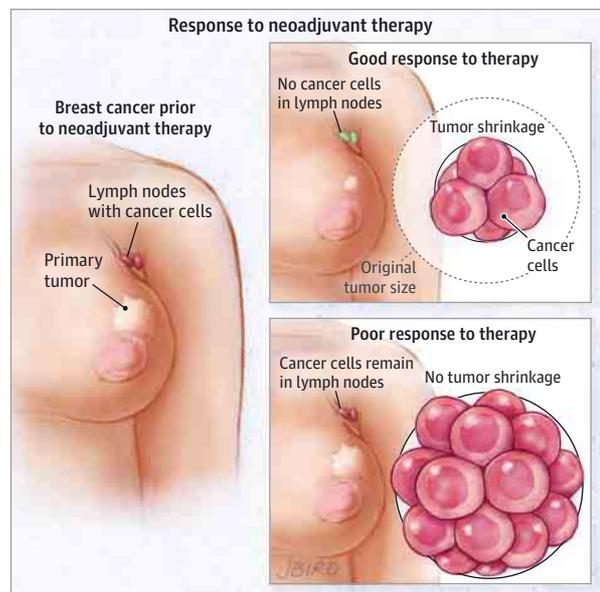
- It provides treatment at the earliest opportunity, before there is a chance for micrometastases to grow while a patient receives and recovers from the local therapy.
- It may be more reliable than adjuvant therapy, particularly if local therapy is challenging and recovery is difficult. Complications can occur during local therapy that can make it difficult to give additional therapies reliably later.
- In some settings, tumor shrinkage of visible disease may make it possible to pursue a curative approach that was not possible with a larger cancer. A smaller cancer also allows for a less extensive surgery than initially required.
- It allows for measurement of systemic therapy effect on visible disease, which is correlated with long-term outcomes.

Assessing Response to Neoadjuvant Therapy

The degree of response to neoadjuvant therapy can be assessed by tumor shrinkage seen on scans, or by the extent of cancer cell death

seen under the microscope from samples of the tumor and/or lymph nodes. In many cancers, a good neoadjuvant therapy is correlated with favorable survival. A **pathologic complete response**, in which there is no cancer seen in surgically removed tissue after neoadjuvant therapy, indicates a high probability of cure in many cancer settings.

Recommendations for adjuvant therapy may be based on response to neoadjuvant therapy. For example, if the first approach was less successful than hoped, a different systemic therapy may be used for adjuvant therapy.



FOR MORE INFORMATION

- Global Resource for Advancing Cancer Education (GRACE)
<http://cancergrace.org/cancer-101/2015/05/18/neoadjrx/>.

+ To find this and other JAMA Oncology Patient Pages, go to the Patient Page link on the *JAMA Oncology* website at <http://www.jamaoncology.com>.

The JAMA Oncology Patient Page is a public service of *JAMA Oncology*. The information and recommendations appearing on this page are appropriate in most instances, but they are not a substitute for medical diagnosis. For specific information concerning your personal medical condition, *JAMA Oncology* suggests that you consult your physician. This page may be photocopied noncommercially by physicians and other health care professionals to share with patients. To purchase bulk reprints, call (312) 464-0776.