

## Understanding Cancer Types and Staging

In order to even begin to start researching your cancer, you need to gather some basic information about your situation. You need:

- The **Medical Name** of Your Cancer
- The **Stage** of Your Cancer
- *Possibly* the **Grade** of Your Cancer
- *Possibly* **Other Prognostic Factors**

You needn't understand every bit of the detailed explanation below to get this information. All you need to do to is to ask your doctor for the medical name of your cancer, the stage of your tumor, which will be a Roman numeral I-IV or "recurrent", and maybe the grade, and also for the results of any special tests that were done on your tumor. (When you ask, it's also helpful to get copies of any operative reports, and any pathology or biopsy reports.)

If you do choose to do serious research into the technical literature for your cancer, it will be *extremely* useful to understand how cancer is classified and staged in general, as well as to understand the staging system for your particular cancer.

### Getting the Medical Name of Your Cancer

Appropriate treatment for cancer depends on what kind of cancer you have. The type of cancer is determined by the organ the cancer starts in, the kind of cell from which it is derived, as well the appearance of the cancer cells.

Cancer begins when a cell begins dividing uncontrollably. Eventually these cells form a visible mass or tumor. This initial tumor is called the "primary" tumor. Cells from the primary tumor can break off and lodge elsewhere in the body where they then grow into secondary tumors. This process is called "metastasis" and a cancer which has spread to other organs is called "metastatic." When cancer spreads to another organ, the type of cancer remains the type of the primary tumor. Thus cancer that

### If You're In the Process of Diagnosis

Being diagnosed with cancer is a *process*. It doesn't happen all at once. If you have just gotten word you may have cancer, probably have cancer, or even do have cancer, the type and stage of your cancer may still be unknown. In many cases, the doctors can be pretty sure of the type and stage just from the initial studies, but sometimes even the type of cancer is in question for quite some time.

A few pointers:

- **Until a pathologist has examined a sample of your tumor from surgery or a biopsy, the exact type of cancer may not be known.**

For cancer in a number of organs, the vast majority of cancers are of the same type. For example almost all prostate cancers are adenocarcinomas and a large majority of cervical cancers are squamous cell carcinoma. The grade and other cellular prognostic factors will also not be known until a

started in the colon and spread to the liver is still colon cancer. It is not "liver cancer". Similarly breast cancer that has spread to the bone is not "bone cancer", it is metastatic breast cancer.

Often, several different kinds of cancer can start in the same organ. For instance, kidney cancers include renal cell cancer, the most common kidney cancer, Wilm's tumor, which usually affects children, and transitional cell cancer, which is similar to bladder cancer. The treatment of these three kinds of kidney cancer is completely different. So you can see that it would be difficult to research the options for kidney cancer unless you know what kind you have. To find out what kind of cancer you have, the easiest thing is to ask your doctor, but the diagnosis will also be on most medical reports pertaining to your case.

Some people who write me request help with such cancers as "carcinoma", "adenocarcinoma" or, "sarcoma". These are actually very broad classes of cancer cell types, rather than particular cancers, and are not nearly specific enough to allow one to research treatment. Sarcomas are cancers of the connective tissue, cartilage, bone, muscle, and so on. Carcinomas are cancers of epithelial (lining) cells. Adenocarcinoma refers to carcinoma derived from cells of glandular origin. One can, for instance, have an adenocarcinoma of the pancreas, or an adenocarcinoma of the lung. These are very different cancers.

sample of your tumor is examined. In a quite a few cases this may not happen until after surgery to remove the primary tumor.

- **Before surgery to remove the primary tumor, the staging is only presumptive.** The exact degree of spread is often impossible to determine until the pathologist examines the surgical specimen. The actual degree of lymph node involvement is often not known until after surgery. For some cancers, such as breast cancer, surgical procedures are done just to determine whether the nodes are involved.

Despite these uncertainties, you can start researching the staging and treatment of the type of cancer you are suspected of having well before the final diagnosis is in. If you do, you will get far more out of your doctor visits, and you will be primed to make the important decisions ahead. Be prepared for surprises as new information comes in. Cancer is a real roller coaster, and you may have to change your direction many times before you are done.

## Cancer Staging

Cancer staging systems describe how far cancer has spread anatomically and attempt to put patients with similar prognosis and treatment in the same staging group. Since prognosis and treatment depend quite a bit on the stage, you can see how important it is to know what stage you have! At the same time other factors, including your general health, your own preference, and the results of biochemical tests on your cancer cells will contribute to determining the prognosis and treatment. So while the stage is important it is not everything.

The concept of stage is applicable to almost all cancers except for most forms of leukemia. Since leukemias involve all of the blood, they are not anatomically localized like other cancers, so the concept of staging doesn't make as much sense for them. A few forms of leukemia do have staging systems which reflect various measures of how advanced the disease is. For most solid tumors, there are two related cancer staging systems, the Overall Stage Grouping, and the TNM system.

### Overall Stage Groupings (Roman Numeral Staging)

In this system, cases are grouped into four stages denoted by Roman numerals I through IV, or are classified as "recurrent." In general, stage I cancers are small localized cancers that are usually curable, while stage IV usually represents inoperable or metastatic cancer. Stage II and III cancers are usually locally advanced and/or with involvement of local lymph nodes. Actually, these stages are defined precisely, but the definition is different for each kind of cancer. In addition, it is important to realize that the prognosis for a given stage also depends on what kind of cancer it is, so that a stage II non small cell lung cancer has a different prognosis from a stage II cervical cancer.

Unfortunately, it is common for cancer to return months or years after the primary tumor has been removed because cancer cells had already broken away and lodged in distant locations by the time the primary tumor was discovered, but had not formed tumors which were large enough to detect at that time. Sometimes a tiny bit of the primary tumor was left behind in the initial surgery and this later grows into a macroscopic tumor. Cancer that recurs after all visible tumor has been eradicated, is called **recurrent disease**. Disease that recurs in the area of the primary tumor is **locally recurrent**, and disease that recurs as metastases is referred to as a **distant recurrence**. Distant recurrence is usually treated similarly to stage IV disease (sometimes the terms are used interchangeably) and anyone in this situation should investigate options for both stage IV and recurrent disease. The significance of a Local recurrence may be quite different than distant recurrence, depending on the type of cancer.

For solid tumors, stages I-IV are actually defined in terms of a more detailed staging system called the "TNM" system.

## TNM Staging

In the TNM system, TNM stands for Tumor, Nodes, and Metastases. Each of these is categorized separately and classified with a number to give the total stage. Thus a T1N1M0 cancer means the patient has a T1 tumor, N1 lymph node involvement, and no distant metastases. Of course the definitions of T, N and M are specific to each cancer, but it is possible to give a general idea of what they mean.

### T: Tumor

**T** Classifies the extent of the primary tumor, and is normally given as T0 through T4. T0 represents a tumor that has not even started to invade the local tissues. This is called "In Situ". T4 on the other hand represents a large primary tumor that has probably invaded other organs by direct extension, and which is usually inoperable.

### N: Lymph Nodes

**N** classifies the amount of regional lymph node involvement. It is important to understand that only the lymph nodes draining the area of the primary tumor are considered in this classification. Involvement of distant lymph nodes is considered to be metastatic disease. The definition of just which lymph nodes are regional depends on the type of cancer. N0 means no lymph node involvement while N4 means extensive involvement. In general more extensive involvement means some combination of more nodes involved, greater enlargement of the involved nodes, and more distant (But still regional) node involvement.

### M: Metastasis

**M** is either M0 if there are no metastases or M1 if there are metastases.

As with the other system, the exact definitions for T and N are different for each different kind of cancer.

As you can see, the TNM system is more precise than the I through IV system and certainly has a lot more categories. The two systems are actually related. The I through IV groupings are actually defined using the TNM system. For example, stage II non-small cell lung cancer means a T1 or T2 primary tumor with N1 lymph node involvement, and no metastases (M0).

## Staging System Variations and Changes

There is no law of nature that all cancers are best classified into just four prognostic groups. For many cancers four prognostic groups is not enough, so the overall staging is further divided with classifications like IIa, and IIIb. (A few cancers have fewer than four stage groupings.) You may find it natural to assume that the differences in prognosis between sub-groups, like IIIa and IIIb, is smaller than between major divisions like II and III, but this is not necessarily the case. For instance in non-small cell lung cancer, the difference between stage IIIa and stage IIIb is very important. People with stage IIIa cancer have a chance of being cured with treatment which

includes surgery, whereas surgery generally does not help people with stage IIIb who have a substantially worse prognosis. Again, you must find the specific staging and prognostic information for your cancer to know what the staging means in terms of prognosis.

For leukemias and other cancers which don't form solid tumors, the staging is again different. Because there is not a localized primary tumor with distinct metastasis to lymph nodes and other organs, the TNM system simply doesn't apply. Often there are defined stages I through IV but if so it will depend on various factors such as the blood count, extent of bone marrow involvement or the presence or absence of symptoms.

Although the trend is towards standard terminology, some types of cancers use staging systems with different nomenclatures. For example, prostate and colon cancer are sometimes staged as A through D rather than I through IV. In these cases, unfortunately there is more than one staging system in use at the same time! Obviously you need to be aware of which staging system is being used in a particular paper or reference, and which was used in your case. Usually, the staging used will be referenced according to the originator of the paper - e.g. the *Duke* staging system for colon cancer. Often you can figure out what your stage was in the "other" system with specific information about the extent of your cancer from your pathology and operative reports.

As if this weren't enough, new information and improvements in treatment changes the prognosis or treatment of various subgroups, and as a result, the staging system for individual cancers must be revised from time to time. If you are relying on recent information, as you should be, then you will usually be looking at research data based on the latest staging, but be alert for the possibility that the staging just recently changed for your cancer so that some relatively recent papers use the older system.

## **How To Find The Staging System For Your Cancer**

In order to understand the entire staging system for your kind of cancer, you can consult a book [\[See Book Recommendations\]](#), but you can get also basic staging information on the web from [The National Cancer Institute](#). To find it, go to their [Cancer information by Type](#) section, find the page for your type of cancer, and then click on the treatment statement for your type of cancer. There is both a patient and professional statement - the patient statement will have a simplified version and it's good to look at this before tackling the more detailed and technical professional version.

## **Perspective is Important!**

It is important to know that while stages are an important guide to treatment and prognosis, they are certainly not the whole story. There can be many individual situations within these stage groupings. For instance, if a patient with kidney cancer has only one metastasis and it can be removed surgically, and it's been several years since he had his kidney out, the prognosis is much better than if he had many metastases which appeared just after surgery to remove the kidney. Sometimes the treatment depends on just where metastases are located. There are, for instance,

specialized methods for treating bone metastases and brain metastases. If a new treatment becomes available, some sub-group of patients within a certain stage may suddenly have a much better prognosis. If you find such a treatment, then you have a much better prognosis! Finally, it's important to keep in mind that there is considerable variation in outcome for every type and stage of cancer. A prognosis associated with a cancer stage is only a general guide, not an infallible prediction, a sentence, or a guarantee. I highly recommend Stephen Jay Gould's [The Median Isn't the Message](#) to get a healthy perspective on prognostic statistics.

## Tumor Grading

Tumor grade refers to a measure of how abnormal cells from your tumor appear under the microscope. This can refer to the appearance of the cells or to the percentage that appear to be dividing. The higher the grade, the more aggressive and fast growing the cancer. Tumors are typically classified from least to most aggressive as grade I through IV.

The grade is much more important for some kinds of cancers than for others. For most kinds, it is a somewhat secondary factor, but for a few kinds of cancers, notably certain brain tumors, prostate cancer, and lymphomas, it is extremely important. Again your doctor will know how your tumor was graded and how important it is to your type of cancer. The grading will also be found on the pathology report from your biopsy or surgery. For information on understanding pathology reports, see [Dr. Ed Uthman's "The Biopsy Report"](#)

## Other Prognostic Factors

The results of specific molecular tests on your cancer cells may play a significant role in determining treatment and prognosis. For example, breast cancer is often treated differently depending on whether the cancer cells are found to be Estrogen Receptor Positive (ER+) or Negative (ER-). ER+ cells have receptors for estrogen on their surface, and their growth often requires the presence of estrogen. ER+ tumors are more affected by hormonal treatment and tend to be less aggressive.

As usual, which tests are done depends on your type of cancer, and to some extent which tests the doctor decided to order. You can find out what additional tests were done by talking to your doctor, and by consulting your pathology report.

I expect that over time, the use of specific molecular diagnostics will become both more common, and more important. Eventually, therapies may be tailored more according to the individual biochemical characteristics of the tumor and patient, and less based on the crude measures of how far the cancer has spread which we call staging.

Taken from <http://www.cancerguide.org>