

How Cancer is Diagnosed

Patient Comments

I found a lump...

This freckle is growing and changing color...

I can't get rid of this cough...

Narrator

These symptoms, along with others, are on the American Cancer Society's list of Early Warning Signs for cancer. If you have these symptoms, does it mean you *have* cancer? Not necessarily. These signs can be, and often are, caused by other, more benign conditions. But if it *is* a cancer, the sooner it's diagnosed and treated, the better your chances are for a cure

Often, cancers are discovered because someone is alert to one of the 'warning signs' ... or notices a change... or feels that something might be wrong and asks a doctor about it. Sometimes doctors discover possible cancers during routine physical examinations. And for some... not all... cancers, there are screening tests such as the Pap smear, the PSA blood test for prostate cancer, and the mammogram. Many cancers are detected that way.

Michael Deavers, MD

"A physical exam, lab work and imaging studies can suggest that a cancer is present, but for a definitive diagnosis of cancer, a biopsy sample needs to be examined by a pathologist under a microscope."

Janet Bruner, MD

"Until we have a biopsy, we can't be absolutely sure that a patient has cancer. We can be very suspicious, but we can't be positive, until we see the cells under the microscope."

Narrator

So, a biopsy... taking a tissue sample from the suspicious area... will need to be done so it can be analyzed by a pathologist who is expert in differentiating cancer cells from other kinds of cells.

Different kinds of biopsy procedures are used, depending on the location of the possible cancer. If it's a skin lesion, for example, it may be removed or biopsied in a fairly simple procedure, often done in the doctor's office or clinic.

For some kinds of tumors, biopsy samples are removed with a needle. Examples are "Fine Needle Aspirations" and "Core Biopsies". These are done in an outpatient clinic.

Other tumors can be reached for biopsy using an endoscope. There are several types of endoscopic procedures, each designed to view particular areas of the body. For instance, colonoscopy is used to view and biopsy inside the colon; bronchoscopy examines the lungs, and

How Cancer is Diagnosed

laparoscopy examines the abdominal cavity. In each of these procedures, a flexible plastic tube with a tiny camera on the end is inserted into a body cavity, allowing the physician to view the suspicious area and take a sample for biopsy.

Tumors that are located deep in the body, or those that must be removed intact require an operation by a surgeon to remove them for study. This is often done in outpatient or day surgery. The tissue obtained for a biopsy, either liquid specimens or thin segments of tissue, are sliced, stained and mounted on slides to be viewed under a microscope by a pathologist who looks at the cells within the tissue.

Groups of normal cells typically have the same size, shape and color, and growth occurs in an orderly pattern. Cancer cells, on the other hand, look different. Some are large; some are small; some are more deeply or darkly colored by the stains used to highlight features of the cells.

Michael Deavers, MD

"Most cancers can be routinely diagnosed by a majority of pathologists. However, there are some cancers that are a little bit more complex and may need the expertise of a specialist. Some cancers can mimic benign tumors. Some cancers may be difficult to classify. Other cancers may not even have originated at the sites where they first appear."

Janet Bruner, MD

"For instance, a tumor that you see in the lung may not actually arise in the lung. It may be coming from another organ or body site such as the breast, and it's very important for your physician to know that before they plan the treatment. Lung cancer is treated very differently from breast cancer.

In a lot of cases, a biopsy may show that there is no cancer present, but it's very important to have that diagnosis made and have the tissue looked at, because if the patient does have cancer, it's important to make the right diagnosis and to treat it early."

Narrator

If the specimen turns out to be cancer, the pathologist will also use information gathered during the biopsy to determine its stage and grade.

Staging: is a system of classifying how far the tumor has invaded the tissue around it...whether it has spread...how advanced it is.

Grade: refers to the nature of the cells that make up the tumor, and can help predict how it might behave, or how likely it is to *metastasize* ... whether it will grow rapidly or spread, for example, and how it might respond to treatment. Stage and grade are extremely important. They help determine the best treatment options.

How Cancer is Diagnosed

In addition to a biopsy, other procedures and tests are necessary to study the problem area in detail... to determine exactly where it's located... how big it is ...whether it has spread... whether it has begun to affect your overall health.

Your physician will examine you carefully... will probably order blood and urine tests to assess your general physical condition and to detect additional signs and symptoms that may help complete the picture.

For many kinds of cancers, some combination of imaging studies may be necessary... pictures of the internal structures of the body. X-rays are the simplest imaging studies, and they can tell us some information... but for most cancer diagnoses, additional, more sophisticated imaging will be needed ... such as ultrasound, PET or CT scans, MRI's, or bone scans.

These kinds of studies provide much more detail about a suspicious area or a tumor... help us precisely locate it... determine how large it is... and determine whether it has spread to other tissues or organs.

Occasionally, tumors are very difficult to locate. For example, sometimes we can see evidence of metastases, but not the original tumor. In those situations, there are a number of highly specialized and advanced imaging techniques that can be used.

Marshall Hicks, MD

"There's really been an explosion of imaging technology over the last few years and a lot of the different imaging modalities have undergone an advancement.

One of the more exciting things that has happened in imaging lately is that we've started to identify which areas of tissue are metabolically more active. They consume more oxygen or consume more energy sources than other tissues, implying that that's abnormal, and it could be tumor..."

Homer Macapinlac, MD

"Imaging allows us to see deep within the body and to see the body in a three-dimensional mode. That means we can have slices of the body and go through them with very great accuracy and see the structures. All of this information plays an important part in the making an accurate diagnosis."

Janet Bruner, MD

"It's very important to have an exact diagnosis of the type of tumor, because cancer cases these days are treated with drugs that are specific for different genetic variance of cancer. Some times, we can make a diagnosis using our routine procedures, but sometimes we need to do a lot of special testing in order to work out the molecular genetics of the cancer in order to use the best drug for that particular cancer and to treat it most effectively."

How Cancer is Diagnosed

John Mendelsohn, MD, President, M.D. Anderson Cancer Center

"Today we have ever more sophisticated and exacting tools to use for cancer diagnosis... enabling us to make earlier and more accurate diagnoses than ever before. And that is one of the most powerful weapons we have against this disease.

If you're concerned that you, or someone you love might have cancer... perhaps you've noticed one of the warning signs, or a symptom that concerns you... or you've had an abnormal lab or screening test... this is not a cause for panic, but it does call for further investigation. Not all suspicions turn out to be cancer.

On the other hand, many cancers found early can be cured completely. So, we urge you to have the recommended screening tests, and to be alert to warning signs, and when indicated, to undergo the tests required to get a timely and accurate diagnosis."