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## How Does Cancer Spread? A Look at Metastatic Cancer

by Sarah Carpenter

Cancer is a disease in which some of the body's cells grow uncontrollably and spread to other parts of the body. But how and why does this happen? We will explore how cancer spreads, what causes cancer cell growth, the science behind it and the risks associated with metastasis. We'll also touch on what can be done to slow the spread of cancer including treatment options like chemotherapy, radiation and surgery.

### What Is Metastatic Cancer?

The process by which cancer cells spread to other parts of the body is called metastasis. [Cancer that spreads](#) is called metastatic cancer. For many types of cancer, it is also called Stage IV. When observed under a microscope and tested in other ways, metastatic cancer cells have features like that of the primary cancer and not the cells in the place where the metastatic cancer is found. This is how doctors can tell that it is cancer that has spread from another part of the body. Metastatic cancer has the same name as the primary cancer. For example, breast cancer that spreads to the lung is called metastatic breast cancer, not lung cancer. It is treated as Stage IV breast cancer, not as lung cancer.

### How Does Cancer Spread?

Cancer cells spread through the body in a series of steps. These steps include:

1. Growing into or invading nearby normal tissue.
2. Moving through the walls of nearby lymph nodes or blood vessels.
3. Traveling through the lymphatic system and bloodstream to other parts of the body.
4. Stopping in small blood vessels at a distant location, invading the blood vessel walls and moving into the surrounding tissue.
5. Growing in this tissue until a tiny tumor forms.
6. Causing new blood vessels to grow which creates a blood supply that allows the metastatic tumor to continue growing.

Most of the time, spreading cancer cells die at some point in this process. As long as conditions are favorable for the cancer cells at every step, some of them can form new tumors in other parts of the body. Metastatic cancer cells can also remain inactive at a distant site for many years before they begin to grow again, if at all.

## The Causes of Cancer Cell Growth and the Science Behind It

[Cancer is caused by changes](#) (mutations) to the DNA within cells. The DNA inside a cell is packaged into a large number of individual genes — each of which contains instructions telling the cell what functions to perform and how to grow and divide. Errors in the instructions can cause the cell to stop its normal function and may allow a cell to become cancerous. A gene mutation can instruct a healthy cell to:

- **Allow rapid growth.** A gene mutation can tell a cell to grow and divide more rapidly. This creates many new cells that all have the same mutation.
- **Fail to stop uncontrolled cell growth.** Normal cells know when to stop growing so that there is the right number for each type of cell. Cancer cells lose the controls (tumor suppressor genes) that tell them when to stop growing. A mutation in a tumor suppressor gene allows cancer cells to continue growing and accumulating.
- **Make mistakes when repairing DNA errors.** DNA repair genes look for errors in a cell's DNA and make corrections. A mutation in a DNA repair gene may mean that other errors aren't corrected, leading cells to become cancerous.

These mutations are the most common ones found in cancer. However, many other gene mutations can contribute to causing cancer. Gene mutations can occur for several reasons, for instance:

- Gene mutations you're born with. You may be born with a genetic mutation inherited from your parents. This type of mutation accounts for a small percentage of cancers.
- Gene mutations that occur after birth. Most gene mutations occur after you're born and aren't inherited. Several forces can cause gene mutations, such as smoking, radiation, viruses, cancer-causing chemicals (carcinogens), obesity, hormones, chronic inflammation, and a lack of exercise.

Gene mutations frequently occur during normal cell growth. However, cells contain a mechanism that recognizes when a mistake occurs and repairs the mistake. Occasionally, a mistake is missed. This could cause a cell to become cancerous.

The gene mutations you're born with, and those that you acquire throughout your life work together to cause cancer. For instance, if you've inherited a genetic mutation predisposing you to cancer, that doesn't mean you're certain to get cancer. Instead, you may need one or more other gene mutations to cause cancer. Your inherited gene mutation could make you more likely than other people to develop cancer when exposed to a certain cancer-causing substance. It's unclear just how many mutations must accumulate for cancer to form. This likely varies among cancer types.

## Risk Factors for Cancer Cell Growth

While doctors know what may increase your risk of cancer, most cancers occur in people without known risk factors. Factors known to increase your risk of cancer include:

- Your Age
  - Cancer can take decades to develop. That's why most people diagnosed with cancer are 65 or older. While it's more common in older adults, cancer isn't exclusively an adult disease — cancer can be diagnosed at any age.
- Your Habits
  - Certain lifestyle choices increase your risk of cancer. Smoking, drinking more than one drink a day for women and up to two drinks a day for men, excessive exposure to the sun or frequent blistering sunburns, being obese and having unsafe sex can contribute to cancer. You can change these habits to lower your cancer risk — though some habits are easier to change than others.
- Your Family History
  - Only a small portion of cancers are due to an inherited condition. If cancer is common in your family, it's possible that mutations are being passed from one generation to the next. You might be a candidate for genetic testing to see whether you have inherited mutations that might increase your risk of certain cancers. Remember that having an inherited genetic mutation doesn't necessarily mean you'll get cancer.
- Your Health Conditions
  - Some chronic health conditions (such as ulcerative colitis) can increase your risk of certain cancers. Talk to your doctor about your risks.
- Your Environment
  - The environment around you may contain harmful chemicals that can increase your cancer risk. Even if you don't smoke, you might inhale secondhand smoke if you go where people smoke or if you live with someone who smokes. Chemicals in your home or workplace (such as asbestos and benzene) also are associated with an increased risk of cancer.

## Risks Associated with Metastasis

[A risk factor](#) increases a person's chance of developing cancer or having it come back after it is first treated. [Advancing age](#) is the most important risk factor for cancer overall and for many individual cancer types. The incidence rates for cancer increase steadily as age increases — from fewer than 25 cases per 100,000 people in age groups under age 20 to about 350 per 100,000 people among those aged 45–49 and to more than 1,000 per 100,000 people in age groups 60 years and older.

Although risk factors often influence cancer development, most do not directly cause cancer. Some people with several risk factors never develop cancer while others with no known risk factors do. Knowing your risk factors and discussing them with your doctor may help you make more informed lifestyle and healthcare choices.

## How to Slow the Spread of Cancer

There are [many types of cancer treatment](#), and the types of treatment you receive will depend on the type of cancer with which you have been diagnosed and how advanced it is. Some people diagnosed with cancer will have only one treatment. However, most people have a combination of treatments such as surgery with chemotherapy and radiation therapy. Here are some types of cancer treatment you might receive:

- Biomarker Testing for Cancer Treatment

- Biomarker testing is a way to look for genes, proteins and other substances (called biomarkers or tumor markers) that can provide cancer information. Biomarker testing can help you and your doctor choose a cancer treatment.
- Chemotherapy
  - Chemotherapy is a cancer treatment that uses drugs to kill cancer cells.
- Hormone Therapy
  - Hormone therapy is a treatment that slows or stops the growth of breast and prostate cancers that use hormones to grow healthy cells.
- Hyperthermia
  - Hyperthermia is a treatment in which body tissue is heated to as high as 113 degrees F to help damage and kill cancer cells with little or no harm to normal tissue.
- Immunotherapy
  - Immunotherapy is a cancer treatment that helps your immune system fight cancer.
- Photodynamic Therapy
  - Photodynamic therapy uses a drug activated by light to kill cancer and other abnormal cells.
- Radiation Therapy
  - Radiation therapy is a type of cancer treatment that uses high doses of radiation to kill cancer cells and shrink tumors.
- Stem Cell Transplant
  - Stem cell transplants are procedures that restore stem cells that grow into blood cells in people who have had theirs destroyed by high doses of chemotherapy or radiation therapy.
- Surgery
  - When used to treat cancer, surgery is a procedure in which a surgeon removes cancer from your body.
- Targeted Therapy
  - Targeted therapy is a type of cancer treatment that targets the changes in cancer cells that help them grow, divide and spread.

## How Cancer Spreads

In metastasis, cancer cells break away from where they first formed, traveling through the blood or lymph system and forming new tumors in other parts of the body. Fortunately, many types of cancer treatments are available to those experiencing cancer. The type of treatment you receive will depend on the cancer type and how advanced it is.

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*Sarah Carpenter is a freelance writer whose portfolio spans the industries of healthcare, higher education and entertainment. Find out more at [her website](#).*

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