

How does cancer spread to other parts of the body?

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Credit: Michelle Leman from Pexels

All cancers begin in a single organ or tissue, such as the lungs or skin. When these cancers are confined in their original organ or tissue, they are generally more treatable.

But a cancer that spreads is much more dangerous, as the organs it spreads to may be vital organs. A [skin cancer](#), for example, might spread to the brain.

This new growth makes the cancer much more challenging to treat, as it can be difficult to find all the new tumors. If a cancer can invade different organs or tissues, it can quickly become lethal.

When cancer spreads in this way, it's called [metastasis](#). Metastasis is [responsible for](#) the majority (67%) of cancer deaths.

Cells are supposed to stick to surrounding tissue

Our bodies are made up of trillions of tiny cells. To keep us healthy, our bodies are constantly replacing old or damaged cells.

Each cell has a specific job and a set of instructions (DNA) that tells it what to do. However, sometimes DNA can get damaged.

This damage might change the instructions. A cell might now multiply uncontrollably, or lose a property known as adherence. This refers to how sticky a cell is, and how well it can cling to other surrounding cells and stay where it's supposed to be.

If a cancer cell loses its adherence, it can break off from the original tumor and travel through the bloodstream or lymphatic system to almost anywhere. This is how metastasis happens.

Many of these traveling cancer cells will die, but some will settle in a new location and begin to form new cancers.

Particular cancers are more likely to metastasize to [particular organs](#) that help support their growth. Breast cancers commonly metastasize to the

bones, liver, and lungs, while skin cancers like melanomas are more likely to end up in the brain and heart.

Unlike cancers which form in solid organs or tissues, blood cancers like leukemia already move freely through the bloodstream, but [can escape](#) to settle in other organs like the liver or brain.

When do cancers metastasize?

The longer a cancer grows, the more likely it is to metastasize. If not caught early, a patient's cancer may have metastasized even before it's initially diagnosed.

Metastasis can also occur after [cancer treatment](#). This happens when cancer cells are dormant during treatment—drugs may not "see" those cells. These invisible cells can remain hidden in the body, only to wake up and begin growing into a new cancer months or even years later.

For patients who already have cancer metastases at diagnosis, identifying the location of the original tumor—called the "primary site"—is important. A cancer that began in the breast but has spread to the liver will probably still behave like a [breast cancer](#), and so will respond best to an anti-breast cancer therapy, and not anti-liver cancer therapy.

As metastases can sometimes grow faster than the original tumor, it's not always easy to tell which tumor came first. These cancers are called "cancers of unknown primary" and are the [11th most commonly diagnosed cancers in Australia](#).

One way to improve the treatment of metastatic cancer is to improve our ways of detecting and identifying cancers, to ensure patients receive the most effective drugs for their cancer type.

What increases the chances of metastasis and how can it be prevented?

If left untreated, most cancers will eventually acquire the ability to metastasize.

While there are currently no interventions that specifically prevent metastasis, [cancer patients](#) who have their tumors surgically removed may also be given chemotherapy (or other drugs) to try and weed out any hidden cancer cells still floating around.

The best way to prevent metastasis is to diagnose and treat cancers early. Cancer screening initiatives such as Australia's [cervical](#), [bowel](#), and [breast](#) cancer screening programs are excellent ways to detect cancers early and reduce the chances of metastasis.

New screening programs to detect cancers early are being researched for many types of cancer. Some of these are simple: CT scans of the body to look for any potential tumors, such as in England's new lung cancer screening program.

Using [artificial intelligence](#) (AI) to help examine patient scans is also possible, which might identify new patterns that suggest a cancer is present, and improve cancer detection from these programs.

More advanced screening methods are also in development. The United States government's Cancer Moonshot program is currently funding research into blood tests that could detect many types of cancer at early stages.

One day there might even be a RAT-type test for cancer, like there is for COVID.

Will we be able to prevent metastasis in the future?

Understanding how metastasis occurs allows us to figure out new ways to prevent it. One idea is to [target dormant cancer cells](#) and prevent them from waking up.

Directly preventing metastasis with drugs is not yet possible. But there is hope that as research efforts continue to improve cancer therapies, they will also be more effective at treating metastatic cancers.

For now, early detection is the best way to ensure a patient can beat their cancer.

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