

What Happens When Breast Cancer Metastasizes to the Brain?

CU Cancer Center member Ryan Ormond, MD, PhD, explains diagnosis and treatment of breast cancer that spreads to the brain.

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Cancer becomes especially dangerous when it [metastasizes](#) — or spreads — to other parts of the body, including the brain. [Breast cancer](#) is more likely than many other cancers to spread to the brain, due in part to the large amounts of estrogen present in areas including the hippocampus, hypothalamus, and amygdala.

[Ryan Ormond](#), MD, PhD, is a surgeon at the [University of Colorado Cancer Center](#) who treats breast cancer patients whose disease has spread to the brain. We spoke with Ormond — associate professor of [neurosurgery](#) in the [University of Colorado School of Medicine](#) — about how and why the metastasis happens, and how the treatment works.

How common is brain metastasis in breast cancer?

If you look at breast cancer in general, depending on the subtype, somewhere between 30% and 50% of breast cancer patients face brain metastasis at some point in their lives. It's really common in breast cancer. It's most common in patients with HER2-positive and triple-negative breast cancer, due to the biology of the tumors.

Is the brain the most common place for breast cancer to spread, or are there other places in the body that are equally common?

It can spread to nearby lymph nodes as well, but the brain is a very common place. First off, 20% of the body's blood supply goes there, so the brain is a common place for a lot of cancers to spread. But one of the unique things about breast cancer when it goes to the brain — and this was discovered at the CU Cancer Center — is that breast cancer may metastasize more commonly to parts of the brain that are associated with higher estrogen activity.

What is the role of estrogen in the brain?

Estrogen is used in the brain to help modulate several functions. For example, there are estrogen receptors on astrocytes, which are helper cells for the neurons. And certain parts of the brain have increased estrogen activity over others. That seems to be part of the reason metastases are drawn to the brain in breast cancer more frequently than other places, and it's also why breast cancer spreads more frequently to the brain than some other cancers. Prostate cancer, for example, only rarely goes to the brain.

How do you detect breast cancer that spreads to the brain?

It's not often that patients present at the time of diagnosis with brain metastasis, though that does happen sometimes. Patients may have a seizure or become symptomatic and potentially think they are having a stroke before they know they have brain metastasis, and it is identified after a visit to the emergency department. Of course, it can also be diagnosed while an outpatient. A patient may have symptoms, and their medical oncologist gets head imaging and then sends them to neurosurgery.

What are some of the common neurological or other symptoms?

It can be weakness on one side of the body, difficulty speaking, or staring episodes, like having small seizures or having a stroke. Many patients get hydrocephalus, a potentially life-threatening condition where your spinal fluid doesn't drain out of your brain properly because it's obstructed by a tumor and/or swelling. This is much more likely in breast cancer than in lung cancer, for example. But probably the most common presenting symptom is a new, chronic, daily headache.

How are these brain metastases treated at the CU Cancer Center?

We take a multidisciplinary approach. We communicate with each other all the time and we work together as a multidisciplinary team, so we can give treatment paradigms that are best for the patient. We often use focal radiosurgery — high-dose, focused radiation techniques to tumors in the brain that result in better cognitive and memory outcomes. If the tumors need to come out surgically, we use minimally invasive approaches that cause the least amount of damage to the brain as possible. Often by doing this and coupling it with the latest clinical trials and treatment paradigms, our patients live much longer with a better quality of life than the national average.

Why is it important to come to an academic cancer center like the CU Cancer

Center when you have breast cancer that has metastasized to the brain?

One of the real benefits at the CU Cancer Center is our multidisciplinary approach. We have providers from neurosurgery, medical oncology, radiation oncology, radiology, and pathology who are all experts in their field, working together for the best care of the patient. We follow the latest guidelines for treatment, have many state-of-the-art techniques, and have numerous clinical trials to guide therapy. All this results in improved quality of life and survival for our breast cancer patients. Our multidisciplinary team — including neurosurgeons — helps ensure the best focal brain and systemic care to improve the lives of our patients, which is especially important once breast cancer has gone to the brain.

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