

## Metastatic Brain Tumors

### Overview

This fact sheet provides a brief overview of brain metastases. Please see Brain Tumors: An Introduction for more information.

### What is a brain metastasis?

Metastatic brain tumors begin as cancer in another part of the body and spread to the brain via blood or nearby tissue (Fig. 1). There can be one (metastasis) or multiple (metastases) tumors.

The most common primary origin, or area where the cancer originated, is lung, breast, skin (melanoma), kidney and colon but the tumors can come from anywhere. If the primary cancer cannot be found, it is called an "unknown" primary. A diagnostic work-up (x-ray, CT) may be done to look for the primary cancer site.

### What are the symptoms?

Symptoms of a metastasis are related to the location of the brain in which they occur and may include headaches, numbness, weakness, disorientation, imbalance, and seizures.

### Who is affected?

Metastatic brain tumors are the most common type of brain tumor. It affects men and women equally. The incidence increases from ages 45-65 but is most common in those over 65. There has been an increase in metastatic lesions as people are surviving cancers for longer periods of time

### How is a diagnosis made?

- An MRI of the brain is the diagnostic tool of choice. An MRI showing multiple lesions is very suggestive of metastatic tumors.
- A diagnostic work-up may be performed to look for the primary cancer site. This work-up often includes a chest x-ray, CT scan of the chest, abdomen, and pelvis, or a mammogram.
- If a suspicious site for primary cancer is identified, oftentimes that site is biopsied first to help direct treatment. If there is a prior history of cancer, a biopsy may not be necessary. If the primary cancer cannot be identified, then a brain biopsy or surgery to remove the tumor may be performed to determine the diagnosis.

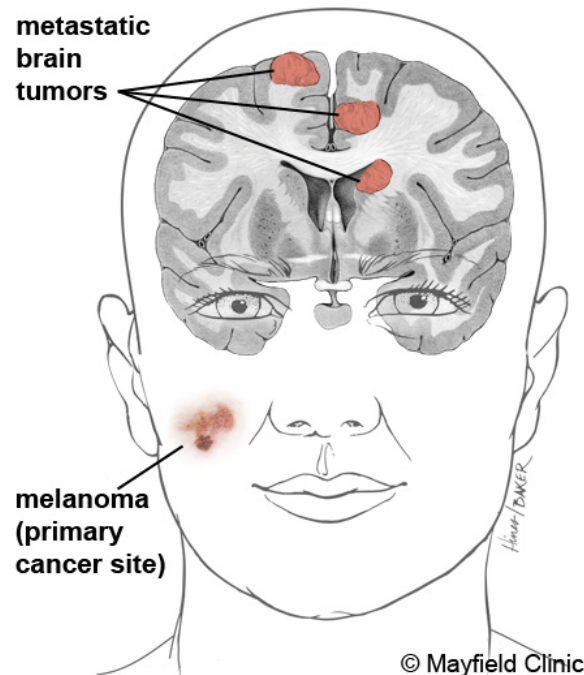


Figure 1. Illustration (top) and MRI (bottom) of multiple metastatic brain tumors that have spread from the melanoma skin cancer on the face.

## What treatments are available?

Treatment options vary depending on the patient's overall health, number and location of brain/spine lesions, location and severity of the primary cancer, and the type of primary cancer.

### Radiation

Radiation therapy uses controlled high-energy rays to damage the DNA inside cells, making them unable to divide and reproduce. The goal of radiation therapy is to maximize the dose to abnormal cells and minimize exposure to normal cells. There are several ways to deliver radiation (see Radiosurgery & Radiotherapy of the Head), these include:

- Stereotactic radiosurgery (SRS) delivers a high dose of radiation during a single session. Although it is called surgery, no incision is made.
- Fractionated stereotactic radiotherapy (FSR) delivers lower doses of radiation over many visits. Patients return daily over several weeks to receive the complete radiation dose.
- Whole brain radiotherapy (WBRT) delivers the radiation dose to the entire brain. It is often used to treat multiple brain tumors and metastases.

Patients with few, smaller metastatic lesions (< 3 cm) can be treated with a single treatment (stereotactic radiosurgery). Patients with multiple metastatic lesions are typically treated with whole brain radiotherapy.

### Surgery

To surgically remove a brain tumor, a neurosurgeon performs a craniotomy to open the skull (see Craniotomy). Sometimes only part of the tumor is removed if it is near critical areas of the brain. A partial removal can still relieve symptoms. Radiation or chemotherapy may be used on the remaining tumor cells.

Surgery is typically recommended for patients with 1 or 2 metastatic brain lesions, in good health, with primary cancer that is treatable. Radiation seeds may be placed at the time of surgery to help prevent tumor recurrence.

### Chemotherapy

Chemotherapy drugs work by interrupting cell division. Unfortunately, chemotherapy affects not only tumor cells but also normal cells. This causes side effects, especially in fast growing cells (e.g., hair, digestive, blood). Chemotherapy drugs can be given orally as a pill, intravenously (IV), or as a wafer placed surgically into the tumor. The drugs most commonly used to treat brain tumors are carmustine (BCNU), lomustine (CCNU), and temozolomide (Temodar). Treatment is delivered in cycles with rest periods in between to allow the body to rebuild healthy cells.

Chemotherapy is typically used to treat the primary cancer as well as the metastatic lesions.

### Sources & links

If you have more questions or would like to schedule an appointment with one of our neurosurgeons, please call (515) 241-5760. Our offices are located on the Iowa Methodist Campus.

Support groups provide an opportunity for patients and their families to share experiences, receive support, and learn about advances in treatments and medications.



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