

## Neoplastic Meningitis

Spinal fluid is constantly being made by the brain. It flows through and around the brain and spinal cord. Occasionally, cancers can shed or dissolve tumor cells in the spinal fluid, a condition called **neoplastic or carcinomatosis meningitis**. This is similar to dissolving sugar in water in that you cannot see the dissolved cells in the fluid. The only way you can detect tumor cells is by taking a small sample of the fluid and looking at it under a microscope, a test called **cytology**. To collect the fluid a spinal tap (lumbar puncture) is required. However, as the fluid flows over the brain and spine, it can leave deposits on the surface. This is often visible on an MRI of the brain or spine. Sometimes, if the MRI looks very suspicious in a patient with a cancer at high risk of spreading to the spinal fluid we do not have to do a spinal tap. Neoplastic meningitis is uncommon, affecting approximately 5% of patients with solid tumors (i.e., lung cancer or breast cancer). It is more common in leukemia and lymphoma.

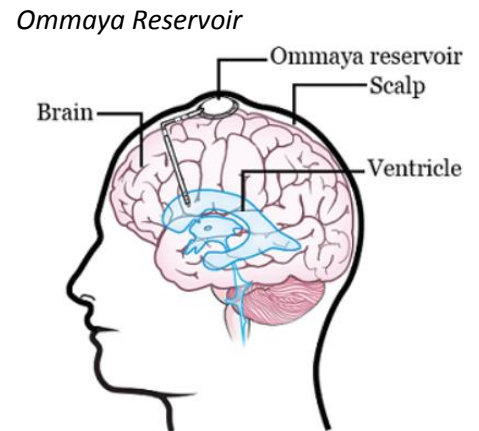
### What symptoms does neoplastic meningitis cause?

Carcinomatosis Meningitis involves the entire brain and spine. As such it can cause a variety of symptoms:

- Confusion
- Weakness on right or left side
- Headache
- Difficulty swallowing
- Double vision or other vision changes
- Hearing loss
- Dizziness or balance problems
- Nausea or vomiting
- Facial droop, numbness or pain
- Neck or back pain
- Shooting pain in arms or legs
- Leg weakness or numbness
- Changes in bowel or bladder function

## How do you treat carcinomatosis meningitis?

Neoplastic meningitis is a difficult problem to treat. The tumor cells cannot be surgically removed from the spinal fluid. The circulating pool of spinal fluid is large (covering the entire brain and spine) and treating the entire area with radiation is risky. Chemotherapy (medicine) administered by mouth or through an IV do not reach the spinal fluid in high enough concentrations to kill the tumor cells (although there are exceptions). In certain patients, the spinal fluid can be treated by injecting chemotherapy directly into the spinal fluid itself. This is called **intrathecal chemotherapy**. There are 2 ways of doing so – repeated spinal taps or an intraventricular reservoir (**Ommaya reservoir**). This is a tube connecting a pool of spinal fluid in the brain to a plastic “bubble” sewn under the scalp. It allows easy, painless, access to the spinal fluid through which medications can be administered and fluid collected. However, it has to be placed in the operating room by a surgeon.



Under some circumstances radiation is used to treat patients with neoplastic meningitis. Examples include treating a deposit on surface of brain or spine that is:

- Causing symptoms
- Obstructing normal flow of spinal fluid
- Larger in size

## How do you monitor neoplastic meningitis?

Periodically an MRI of the brain or spine will be performed. We do so to monitor the progress of deposits on the surface of the brain or spine or to evaluate new symptoms that develop. In addition, we will frequently sample spinal fluid as you go through the treatments.