



American  
Brain Tumor  
Association®

Providing and pursuing answers™

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**Questions from “Understanding Brain Tumors” webinar with Dr. Tim Cloughesy of UCLA  
Medical Center  
9-27-2012**

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**Q: How does one find out what the IDH mutation or MGMT methylation presence is? Is that easily found on a pathology report?**

IDH 1 mutation and MGMT methylation are specific tests. They are not performed at all institutions and may require that tissue be sent to a special center for them to be run. While IDH 1 and MGMT methylation are routinely run on all glioma patients here at UCLA, not all specialized institutions will routinely perform them without a specific request.

**Q: Are today's GMO products responsible for the increase in Meningiomas, their aggressiveness, & problems they cause?**

That is a very good question. There is currently no evidence-based-research that link GMO products to meningiomas or, in fact, any type of brain tumor. Genetically modified foods appear to have the same risks and benefits for health as other foods do. The FDA, EPA, and USDA regulate genetically modified foods, and they require extensive safety data before a new genetically modified crop is released. So far, no research shows that genetically modified foods affect cancer risk or cause long-term health problems.

On the contrary, there is some evidence to show that some genetically modified foods can benefit the health of human beings. One good example is a GMO food called, “golden rice,” which was genetically modified with genes from a daffodil, making it higher in beta carotene. Golden rice is now being used successfully to fight vitamin A deficiency in African children.

There are a plethora of websites that give opinions on the safety of GMO foods. They can be fairly alarming to read. The best sources for information would be reliable sources, such as peer reviewed journals, academic websites, and food science forums with credentialed food scientists answering GMO related questions.

**Q: Please discuss use of Avastin chemotherapy and whether this is seen as a long-term maintenance therapy to extend life.**

Bevacizumab (Avastin) is a type of targeted therapy, called a monoclonal antibody. It is not a chemotherapy. Antibodies are proteins produced by the immune system in response to foreign substances such as bacteria, or viruses. The main difference between your own antibodies and monoclonal antibodies, is that monoclonal antibodies are produced in a laboratory to block specific targets. Avastin inhibits the action of vascular endothelial growth factor (VEGF).

VEGF is a substance that binds to certain cells to stimulate new blood vessel formation. VEGF is an important target because brain tumors grow and exert pressure on the surrounding tissue. The blood supply to the tissue, and also to the brain tumor, is then compromised. The tissue responds by signaling for VEGF. When VEGF reaches the receptor, a cascade of events takes place that allow new blood vessels to form (angiogenesis).

Avastin works by attaching VEGF. Picture a trying a key with the teeth encased in a plastic. It would be unable to fit it into its keyhole. When VEGF is bound to Avastin, it cannot get to the receptor to stimulate angiogenesis. Without new blood vessels, a brain tumor cannot receive the oxygen and nutrients it needs to survive and grow. Avastin may reduce tumor cell growth and cause brain tumors to grow more slowly or to become smaller.

Avastin is FDA approved for the treatment of recurrent glioblastoma. It is given in the vein as an infusion every 2-3 weeks depending on the dose. The drug may show a clear benefit in up to 50% glioblastoma of patients, meaning stable or improved appearance of the tumor on MRI.

Even though Avastin is not a traditional chemotherapy, as with all medications, a small percentage of people can experience side effects. In addition to mild side effects such as dry mouth or fatigue, or pain at the infusion site, rarely, there are more serious side effects which can occur. These include:

**Hypertension** (high blood pressure) can occur in 30% of patients who are treated with Avastin. This can happen even in people who have never had hypertension before. Usually the elevation in blood pressure is mild and can be controlled with antihypertensive medications.

**Softening of the voice** can occur in about 10% of patients. This is sometimes reversible when the medication is discontinued.

**Impaired wound healing**, even in wounds that appear to have healed already. Because of this side effect it is very important to wait at least 28 days (4 weeks) after any surgical procedure to start treatment with Avastin. Impaired wound healing or degradation of an apparently healed wound can occur in 3% of patients receiving Avastin.

**Proteinuria** (protein in the urine) can occur in 1-2% of people and is usually reversible when Avastin is discontinued. Rarely, nephrotic syndrome can arise.

**Bleeding**, sometimes into the brain, sometimes from other areas in the body such as the nose, or the gastrointestinal system. People more at risk for GI bleeding are people with a history of problems such as diverticulitis or peptic ulcer disease. People with a history of bleeding into the brain are more at risk for bleeding in the brain on Avastin. If you develop minor bleeding in the brain, the drug can be stopped until the bleeding subsides, and then sometimes can be

restarted. Potentially serious bleeding into the brain can occur in 1% (one in one hundred) of patients receiving Avastin.

**Thromboembolic events (blood clots)** have occurred in patients receiving Avastin. Clots may form in the legs, (DVT) or sometimes may travel to the lung (pulmonary embolism). There is also a rare risk for heart attacks and strokes. These events have been 2%- 5% of people who receive Avastin.

Most people tolerate Avastin without any difficulty. Because everyone is different, it is not possible to predict what side effects one person will have. The most important thing to consider is if the benefits of taking Avastin for your brain tumor outweigh the risks.

Avastin can be given with or without chemotherapy, and with or without radiation as it can sensitize the brain tumor to radiation. Theoretically, Avastin can be given indefinitely, provided there are no serious side effects.

### **Where can we find a support group?**

Brain tumor-specific support groups listed by state can be found on the ABTA website here:  
<http://www.abta.org/care-treatment/support-resources/support-groups/support-group-listings.html/>