



Heroes of Hope

JOIN THE GREY RIBBON CRUSADE

Brain Tumor Guide for the Newly Diagnosed

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Chapter 1: Introduction

Where, When, How and Why Me?

Whether or not it was a loss of physical balance that led you to be diagnosed with a brain tumor, surely a loss of emotional balance quickly followed.

Every day, over 100 adults will be diagnosed with a primary brain tumor (starting in the brain), and many more will be diagnosed with a cancer that has spread to the brain from someplace else in the body, such as the lung or breast. Additionally, thousands of parents annually will hear these devastating two words – brain tumor – in regards to their child.

There is no known cause of most brain tumors starting in the brain. There are indications that genetic factors or exposure to toxic chemicals or ionizing radiation may contribute to the formation of brain tumors.

Unfortunately, for the worst types of brain tumors, the current standard treatments are not curative for the majority of patients. Unlike most other medical conditions, you will have a lot of important decisions to make. You can make them yourself, or you can select a loved one to act as a caregiver to help you make the decisions. Not only will you have to make choices of treatment options presented to you, but you have to actively seek out options that your medical team might not have access to. We are here to help you sort this out.

You must learn to question what you're told initially and, as treatment plans are put into place, to ask what qualifying factors your diagnosis and treatment plan is based upon. You must also seek out the foremost expert advice.

Typically your physician will have a plan to discuss with you following your initial diagnosis. This plan may include a referral to a neuro-oncologist or neurosurgeon for consultation regarding treatment options, such as surgery, radiation, chemotherapy, or a clinical trial (more on clinical trials later). While in some cases circumstances are such that emergency surgery is the only immediate option due to brain swelling or risk of acute brain injury, typically there is ample time to seek a second opinion and gather more information that can assist in your decision making process.

In some studies as many as twenty-five percent of second opinions resulted in a change of diagnosis in either tumor type or grade and, thus, a change in necessary treatment. An MRI alone can be inconclusive (it may not be a tumor at all), making a thorough examination of your symptoms, and when possible, a biopsy, vital to your diagnosis.

The single-most important factor in your care will be receiving a second opinion and, if possible, your treatment from an expert source, preferably a major brain tumor center that is familiar with advanced forms of diagnosis and treatment of brain tumors. Also, ask whether a neuropathologist who sees a lot of brain tumors reviewed your biopsy.

Most pathologists do not see enough brain tumors to make the subtle distinctions that may be necessary. You can also ask for a second opinion on the reading of the biopsy slides from a major center, such as Johns Hopkins Neuropathology. There is a cost, but the process is easy – your hospital just mails the slides.

For details, go to: <http://pathology.jhu.edu/consultations/neuropath.cfm>

Your primary physician or oncology (cancer) specialist may not be familiar with the advances being made in the treatment of brain tumors, as is often the case. If your medical care team can not answer your most pressing questions or are unwilling to consult on your behalf with available brain tumor experts, you must seek out further information and reliable sources for care, such as those found within major brain tumor centers. Many of these specialized centers will allow you to submit your MRI and CT scans, as well as biopsy specimens, for further examination directly without a referring physician.

Unlike general neurosurgeons, the brain tumor expert neurosurgeons and team members found at these centers perform over fifty brain surgeries annually (some as many as five or more per week) and offer the most technologically advanced procedures with higher rates of survival. Your choice of surgeon and treatment team can profoundly affect the outcome of your care. Included in this guide are links to the major tumor centers nationally, as well as the expert physicians available to assist you locally.

If knowing your enemy (type and grade of tumor) is indeed, half the battle, then having the tools to employ a strategy – a strategy for life – is equally important. Brain tumors can change, grow and reoccur, so it is important to be organized and knowledgeable about your tumor's makeup and location, and your medications and their side effects, symptoms you might expect throughout your treatment and to maintain an ongoing, open dialogue with your medical care team. Physicians rarely engage one another in the type of dialogue patients often assume is transpiring on their behalf. Being organized can assist you by ensuring all of your team members are up-to-date with current information at the time of your appointments and consultations. You must become your own primary care manager!

This guide is made available to help you understand some of the common decisions you'll be facing, answer some of the questions frequently asked by patients and care givers, and to help you get organized so that you can best advocate for the *quality of care you both need and deserve*. Wherever possible, links to further information have been provided for your convenience. If you ever have questions or comments, feel free to call us at 888-295-4740 from 10am to 9pm, NY time, 7 days a week.

Chapter 2: From Day One, A Place for Everything

Tools to Help You Get Organized

The diagnosis of a brain tumor can leave patients and their loved ones in a mental fog; a fog so thick with questions that where to begin, in and of itself, can be debilitating. There are, however, ways in which you can regain control, stepping out from the fog and into the light of day. Organization is your key to obtaining the information you'll need and the proper treatment necessary for your specific type of tumor. The following is a list of tools that has helped other brain tumor patients.

A three-ring binder can become your best friend and treatment partner, easily safeguarding all the necessary information about your tumor-type and treatment plan at your fingertips. Referrals to specialists or for a second (or third) opinion are often delayed by the need to obtain records and, sometimes, by records that have been lost along the way. Maintaining your own copies of the following will ensure your consulting physicians have access to all of your important documents at the time of your appointment. Many people maintain these records on their computer and occasionally print them out and store them in the binder as needed – since it is easier to carry a binder around! Also print out a copy of your current medications and allergies to store in your wallet or pocketbook in case of emergency! Items to include in your treatment binder include:

- **Medical History** – Start with a copy of the first medical history form you are asked to fill out. This will list past medical problems, such as diabetes or heart problems, which may impact the treatment choice, as well as any allergies you have. An important allergy to note is to iodine or shellfish, as the dyes (contrast agents) used in some brain scans contain iodine. This will be helpful when you have to keep filling out similar forms. Keep it updated as things change. You can also ask your doctor for a copy of the history and physical they perform on you.
- **Copies of MRI Films and Reports** – Most radiological centers today can provide you with a copy of your MRI or CT (CAT Scan) on a CD that can be viewed on any computer. When you check in at the MRI / Radiology facility, it's very important to request a copy of the film or a CD along with the written report of the radiologist's findings. Ask BEFORE you go into the scanner, as it is easier for the staff than if you tell them afterward. Most office supply stores carry special three-hole vinyl pages that hold multiple CDs safely within a binder.
- **All Routine Lab and Pathology (biopsy) Reports** – Different members of your medical team will benefit from recent lab results that may have been initially ordered by another physician. Having your personal copies of these items available for review on demand will save time, increase your understanding, and

in some cases, eliminate the need for unnecessary blood work. As a bonus, if you are computer literate, keep track of lab results in an Excel spreadsheet so you can graph results over time and see how you are doing.

- **Medication At-A-Glance** - It's important to disclose all the medications you take to your physician and care team members. Keeping an up-to-date medication record in your treatment binder (including herbal supplements and over-the-counter items) can provide a quick and clear snapshot of your daily meds at-a-glance, *reducing the chance of error when more than one physician is involved with your care.*

You may experience symptoms that are medication related; side effects to a medication that one member of your medical team may not realize you're taking and thus may be incorrectly diagnosed or treated.

Take your treatment binder to **every** appointment with **every** doctor and request that they review this list before prescribing any new medication. You should also request a copy of the drug formulary – a list of covered medications – from your insurance company and keep it in your treatment binder. It may be necessary for your physician to request prior authorization for some medications. Knowing this in advance can save you time and expense.

- **Location, Location, Location** – Knowing the exact location of your tumor will assist you in many ways. By researching the functions of that part of the brain, you can more clearly understand (and be prepared for) many of the symptoms you are experiencing, or might expect to experience. Ask your physician to be specific about the location, perhaps even provide you with a diagram of the brain with a penciled-in tumor site. To understand your tumor, and thus certain therapies available to you, you must understand your tumor's location. Ask what symptoms to expect if the tumor expands.

The brain is divided into six primary regions, each controlling specific functions. The following is a brief overview of each region and their correlating functions:

- **Brain Stem:** Where the brain connects to the spinal cord is called the brainstem and is considered the pathway to the face, also controlling vital heart and lung functions such as breathing, digestion, heart rate and blood pressure, as well as being awake and alert. It is the pathway for all nerve function through the spinal cord to the highest part of the brain. Problems in the brainstem often cause things like double vision, problems with facial muscles, nausea, sleepiness, or weakness on one side of the body. However, because so many nerves go through the brainstem, problems here can cause almost anything.
- **Cerebellum:** Located at the back of the brain above the brain stem, the cerebellum coordinates balance, posture, and coordination, and affects activities such as eating, walking, talking, and moving your eyes.

- **Frontal Lobe:** As the name suggests, the front part of the brain is responsible for organizing thoughts, planning, problem solving and selective attention. The frontal lobe is also the “personality center” of behavior and emotions, judgment and sexual urges. The posterior (back side) of the frontal lobe also houses nerve cells that produce movement.
- **Occipital Lobe:** Located in the mid-back of brain, the occipital lobe is in charge of vision. It takes input from your eyes and turns it into the pictures that you see. Problems in this lobe can cause partial blindness or the inability to recognize things like shapes, colors, or faces.
- **Parietal Lobe:** Located behind the frontal lobe at the top of the brain, the parietal lobe is comprised of a right and left lobe, which together, control our sense of touch, feel and understanding of weight, size and texture, as well as comprehension. Problems in the parietal lobe can cause numbness, tingling, or other problems with sensation. Problems with the right parietal lobe can cause difficulty with figuring out where you are or how to get from one place to another as well as difficulty recognizing your arm when you see it. Problems with the left parietal lobe can cause difficulty speaking or difficulty understanding what other people are saying.
- **Temporal Lobe:** Located on the right and left side of the brain (near ear level), the two temporal lobes help us to distinguish smells and sounds, experience fear and may impact short-term memory. The right lobe is primarily responsible for visual memory while the left controls verbal memory.

A good overview of the brain and its functions can be found at:

<http://www.waiting.com/brainanatomy.html>

- **A Personal Diary** – Keeping a diary is very important as you travel through various treatments options with specialists, beginning on day one! Recording your specific questions and concerns will help ensure that your medical team addresses the answers you and your loved ones or caregivers need. You may want to create a separate section for each team member, writing down which doctor is responsible for the various aspects of your care; medication refills, routine lab work, referrals, as well as, what was discussed at appointments. Questions often arise after leaving an appointment and referencing these pages later may be helpful.

It’s also recommended that you maintain monthly calendar pages to record the start of new medications or therapies, and any bad reactions to them. The starting times of symptoms and side effects may be difficult to recall at a later date, but are important to distinguish their origin.

- **Legal papers – HIPAA:** Every doctor you see will ask you to sign a privacy form (called a HIPAA form). When you fill it out, write in that you want to specifically allow the following people to discuss details of your case with the doctor (or facility); then list by name your spouse / parents / children and maybe a friend. Then ask for a copy of the form, as they keep the original. This will help save time when you need to send someone to pick up reports or films, or to ask questions for you. When they tell you they can't give your children something or talk about something to anyone other than the patient, just show them your copy of the form and they have to allow it!

Advance Directives and Durable Power Of Attorney – We all hate to think about these things, but it can save a lot of trouble later if you handle this now. An advance directive tells your doctor what kind of care you would like to have if you become unable to make medical decisions. A Durable Power Of Attorney lets you designate who will make medical decisions for you if you are unable to. The first time you are admitted to a hospital, they will ask if you want to fill out the forms for these directives, if you do not already have them in place. Do it, and ask for a copy and keep it in your binder. Or search google.com for “Advanced Directives in [your state]” (each state has different laws and forms). If you do already have these forms in place, bring them with you and staff will make a copy for your files and return the original to you.

It is very important to tell your family who your medical power of attorney will be and to tell them what your values are and what kinds of medical treatment you would want or not want, including breathing machines and feeding tubes, if your condition were to worsen and you were unable to communicate or were in a coma.

- **Phone numbers** – Record the name, address, phone number, email address, and a short description of all of your important contacts. Be sure to include your family members who should be contacted in an emergency, all of your doctors, your lawyer and financial advisor and/or insurance agent.

Second “Expert” Opinions

Diagnosing a specific type of brain tumor can be a complicated affair, making confirmation of your diagnosis essential. Second, third or fourth opinions should come from experts within a specific area, such as those who are experts in the removal of brain tumors -- neurosurgeons performing at least twenty-five brain surgeries per year, or an expert in neuro-pathology who can qualify the diagnosis of your tumor biopsy. It's estimated that as many as *twenty-five percent of brain tumor patients will have their diagnosis changed* upon further examination by a second, expert opinion, which can drastically change not only the prognosis, but also the recommended treatment plan.

If your primary physician is not familiar with the most current treatments or clinical trials available for patients with brain tumors, request that he/she consult with one of the many major brain tumor centers and arrange for you to obtain a second, expert opinion.

A review of your MRI or CT, along with an overview of new resources and treatment programs can be obtained through many of the leading major brain tumor centers.

For a list of major brain tumor treatment centers, some of which offer free scan reviews, visit:

<http://www.virtualtrials.com/btcenters.cfm>

Your physician can also consult with The National Cancer Institute. They will also review your case for free. They have excellent adult and pediatric brain tumor specialists available to help you.

Their contact information is available from our advanced search form

(<http://virtualtrials.com/serchfrm.cfm>)

by selecting National Cancer Institute for the facility name.

If you do need to travel for a second or third opinion, there are many organizations that provide financial assistance specifically for brain tumor patients. **Mission4Maureen** funds go directly to patient needs, which may include travel for treatment, maintaining a place to live, and paying medical bills not covered by insurance.

More info is available at <http://www.mission4maureen.com>

Angle Flight, created by a group of volunteer pilots, will arrange for free air transportation for a medically related need for those where time is of the essence, but non-emergency, to those who are financially in need.

More info is available at <http://www.angelflight.com>

Miles for Hope provides flight assistance to those participating in clinical trial treatment programs, as well as host a radio show, Brain Tumor Talk, featuring well-know guests in the field providing information that will inform, offer resources and helpful hints from brain tumor survivors.

Travel applications may be found at www.milesforhope.org/download/TravelAp.pdf

The Role of Caregivers and Loved Ones

It's all too common; you enter your doctor's office with a list of questions and as your physician begins to satisfy his/her query of information, you forget your questions, or worse, forget their answers. Emotions, not your brain tumor, are typically responsible. Emotional support and a second pair of ears can be of tremendous help while you navigate through a new world of tumor terminology.

Even for seemingly routine appointments, whenever possible, take a friend, loved one or caregiver with you. Aside from taking notes of your session, should an overwhelming moment arrive during your physician's explanation of a particular treatment, necessary tests, or expected results, another person will often hear (or interpret) details differently and be able to ask questions that you might not think of at that moment. Encourage them to make frequent notations or observations in your personal treatment binder and take an active role in your care options. If your physician will allow recorded sessions, have your companion manage a small, hand-held recording device and review the discussion afterwards with you.

Support Groups

The Internet offers an unlimited resource for brain tumor patients, including online support groups, sometimes called "mailing lists" or "listserves", chat groups and message boards for sharing experiences and treatment options with others who understand what you're going through. Support groups, either those found on the Internet or a local group sponsored by your hospital/regional cancer organization, can often assist with non-medical issues as well, such as nutrition, relationships, and/or financial concerns.

For a list of online support groups, go to: <http://virtualtrials.com/lists.cfm>

There are many different groups with different focuses. The best group for medical discussions about brain tumors is the brain-temozolomide group. (The name of the group is misleading – it is now for all treatments for brain tumors – but it was originally started for just talking about the drug Temodar).

For a list of "real world" support groups, go to: <http://virtualtrials.com/support.cfm>

Most people are shy about joining a support group, but don't be. You will be amazed at how quickly you feel at ease because the members know and understand what you are going through, something (hopefully) nobody else in your circle of friends knows about.

A word of caution: support groups (both online and "real world") play an important and in many cases, vital role in maintaining a positive outlook during treatment, as well as staying up to date on the latest brain tumor issues. However, you have to be cautious and evaluate how much you can trust anything you find. There are bad people out there looking to make money off of your misfortune, and even people who are trying to help might inadvertently supply you with misleading information. NOTHING on the Internet or a support group meeting should be taken as medical advice. You have to research anything you find and discuss it with your doctors. The chat rooms are most susceptible to problems because there may not be other people to discuss the pros and cons of the treatment. On the other hand, in an online support group like the brain-temozolomide list, you can ask for many people's experiences with a treatment and get a broader view of it.

When using the Internet use common sense and discuss information with your doctor to help you make the best possible decision for your care. Government agencies will have a web address ending in “.gov” and educational/universities will have a web address ending in “.edu”. To evaluate the information you find on a web site, consider the credentials of the person posting the information, how up-to-date the site is, if there is contact information posted on the site, and are the claims on the site are too good to be true or it is selling something.

The Brain Tumor Virtual Trial

This is a study being run by the Musella Foundation. It is a database of brain tumor patients, the treatments they are using and the outcomes. Participants record the treatments that they and their doctors decide to pursue (we do not tell you what treatments to do, we just record the outcome). There is no cost to participate. The patient or caregiver records information in simple forms on our website and posts an update every month. We send email reminders on the first of every month. You also send in a copy of each of your MRI reports (not the films) and pathology reports so that we can verify the information. Participants get to view the ongoing results of the project. The idea is to try to identify which treatments, or combination of treatments, are working the best. In addition to providing greater insight to beneficial therapies for researchers, participants become expert managers of their condition, and can generate reports on the information they entered, such as a graph of their status over time.

To join, or for more information, go to: <http://virtualtrials.com/brain>

Mind, Body & Soul; Faith in Healing and Emotional Wellness

While your primary physician may appear anything but spiritual in his/her approach to your brain tumor, many within the medical community are aware, and in support of, the power of prayer. Prayer, while very personal, can be empowering and pro-active at times when “control” seems out of reach.

To add your name to the Musella Foundation prayer list, visit:
<http://www.virtualtrials.com/prayer.cfm>

Also do not neglect the rest of your body. When facing a major problem like a brain tumor, the smaller problems sometimes get overlooked. You have enough problems to handle without having a “minor” problem blossom into a “major” problem. Be especially mindful of swelling and/or pain in the legs, (which may indicate blood clots which unfortunately are common with brain tumors), dental problems (since some treatments may hurt the gums and teeth), and rashes (which can indicate allergic reactions to treatments).

Emotional Wellness- Your life, as you once knew it, may change. Things may not seem “normal”, but there will be a new “normal” for you and your family. The new normal will

be what you and your family make it. It will take time, but you will settle into a routine that is comfortable for you. Like anything that is lost, you will go through a grieving process. Although, everyone experiences grief and loss differently, you will probably experience some of the universal steps in this process, which may include:

- Shock
- Denial
- Anger
- Depression
- Acceptance

How you work through this process will be highly personal and individual. As you work through each step, you will probably have some additional feelings which may at times present conflicts for you. These emotions are many and can be unpredictable. Neither right nor wrong, they just are and you are entitled to feel the way you do. They may include a feeling of loneliness, sorrow, anger, sadness, blame, and shame that may lead to anxiety and stress. Sometimes you will feel helpless.

To combat this, concentrate on wellness and try to work through each of the feelings rather than denying them. Have a set of coping strategies that will guide you through each step. These strategies may include: (1) accept and understand your limitations, if you have any and set realistic goals (2) get as much up-to-date expert information about your condition as you possibly can so you don't fear the unknown and be pro-active in your treatment plan (3) take good care of yourself by eating well, getting exercise and rest, and not self-medicating with alcohol (4) see a mental health provider if you feel it necessary, as they can help you handle your emotions and stress (5) record your feelings in a journal and/or (6) try exercise, yoga, massage therapy or mediation.

Your goal will be to reestablish the quality of your life, ease stress, and be more in control. It will take time and patience, but you will find your comfort zone.

Chapter 3: Brain Tumor Guide: FAQ

What are the different types of brain tumors?

Brain tumors are described by where they are located in the brain and what kind of cell they started from. **Primary** tumors begin in the brain, while **Secondary** tumors are caused by tumor (cancer) cells that spread to the brain from another “primary” source in the body, such as breast or lung cancer.

Primary brain tumors are classified (diagnosed), in part, by the type of cell it originates from. For example, astrocytomas come from astrocytes, oligodendrogliomas from oligodendrocytes, meningiomas from meningeal cells and medulloblastomas from medulloblasts, just to name a few.

What is a glioma?

The most common type of primary brain tumor is a **glioma**, originating in the brain from glial cells. Glial cells are the “support cells” of the central nervous system, helping neurons and nerve cells do their jobs by communicating information through electrical energy.

While glial cells can belong to several families of cells, most gliomas are made up of either astrocytes or oligodendrocytes, thus, these tumors are also frequently called Astrocytomas or Oligodendrogliomas (oligos). The terms glioma and astrocytoma are sometimes used interchangeably, although this isn’t technically correct.

High-grade (malignant) forms of these gliomas are called Glioblastoma Multiforme (GBM), Anaplastic Astrocytoma, and Anaplastic Oligodendroglioma. They are considered fast growing, rapidly invading nearby tissue. GBMs are the most common malignant brain tumor in adults.

Cellular makeup, speed of growth, location of the glioma, and even the age of the patient can all affect tumor behavior, resulting in a variety of symptoms and different experiences among patients. For this reason, you must guard against assuming that one person’s outcome of treatment for a “like” tumor will be yours.

For more information on specific types of tumors (and treatments), visit the [National Cancer Institute’s Brain Tumor Information Page](#)

What does “tumor grade” mean?

All tumors are given a “grade”, meaning a specific classification that relates to the current speed of growth and the potential to interfere with brain function. Grading is a determination of what stage, or how advanced (bad) a tumor is in its development.

Diagnosing and “grading” a specific tumor type has been described as something that is as much an “art form” as it is a science; typically a determination made by a pathologist after a biopsy. But grading can be somewhat controversial depending on the size of biopsy specimen obtained. One part of the tumor may have smaller, lower grade cells, while larger, more aggressive cells are present in a different location of the tumor. Furthermore, tumors initially assigned a low grade can become aggressive in growth, changing the status of the grade as well during the course of treatment. It is important to have your biopsy examined by a neuro-pathologist who sees a large number of brain tumors, requesting always, a copy of their report for your records and comparison.

Both type and grade of a tumor is critical to your diagnosis and treatment, which is why a second opinion regarding biopsy specimens is so important.

The most common grading system is called the WHO system based on its approval by the World Health Organization. The WHO system classifies all cancers on a grade of I – IV (1 – 4), a grade of 1 or 2 being slow-growing, “benign” tumors, while grades 3 and 4 are faster growing and are considered malignant. A grade 3 is called an “anaplastic astrocytoma” and a grade 4 is called “glioblastoma multiforme”.

When dealing with brain tumors, the word “benign” is a little misleading. It implies that the tumor is not dangerous. Unfortunately, the brain is enclosed in a rigid container (the skull) that allows no space for a tumor mass to grow. As a tumor (even a “benign” tumor) grows, it builds up the intracranial pressure and compresses everything around it, which can lead to neurological problems and even death. Luckily, there has been a lot of progress in the treatment of “benign” brain tumors. One type, the acoustic neuroma, used to be incurable and usually fatal. Now, it can be cured in over 95% of the patients, sometimes with a relatively simple radiation procedure. There is controversy over which way to treat it, either by radiation or surgery, but both options are so good that the decision is now made by trying to determine which treatment will have fewer side effects, as both are curative.

Just be aware that a few hospitals use a different grading system for brain tumors, using a scale of 1 to 3, where WHO grades 1 and 2 are combined into “grade 1” and the rest are moved down 1: an Anaplastic Astrocytoma is then a grade 2, a GBM is then a grade 3. The terms Anaplastic Astrocytoma and GBM are more precise.

For more information on grading brain tumors, visit:
<http://www.neurosurgery.mgh.harvard.edu/newwhobt.htm>

How long has the tumor been there?

It's not an easy question to answer, but slow growing tumors can be present for years without causing any symptoms. Fast-growing tumor types can occur and cause symptoms within a span of six months or less. Nobody really knows how long you had your particular tumor.

Are brain tumors the same as brain cancer?

This is controversial. There are arguments for both sides: some argue that a brain tumor rarely spreads outside of the brain, so it isn't "cancer". Others argue that it has the potential to grow and be deadly, so it is. I feel that brain tumors should be considered "Brain Cancer".

Can brain tumors be removed surgically?

In many cases, yes, they can be removed with surgery. Surgery may actually "cure" some low-grade tumors, such as an Acoustic Neuroma. However, for high-grade tumors, surgery is not a cure, but it does buy time for other treatments to work, offers an opportunity to get material for a biopsy and drug resistance assay, and an opportunity to use treatments that require surgery, such as Gliadel wafer, Gliasite Radiation Therapy System, and many clinical trials. Any tumor can theoretically be removed, but the neurosurgeon uses his experience to make a judgment on the risks versus the benefits. Each tumor is different, but the neurosurgeon can usually predict if – and how much – neurological damage will be done if the tumor is removed. Since surgery for the high-grade tumors isn't a cure, sometimes they are considered inoperable if the expected neurological problems would create unacceptable problems for the patient.

In brain surgery, experience matters a LOT. Doctors who operate on a lot of tumors can usually remove more of the tumor, with fewer side effects than doctors who only operate on a few. They are also much more likely to have the latest high-tech surgical tools available. In general, the more of the tumor removed, the better the outcome. This is why the single most important decision you have to make is WHERE and by WHOM to have treatment. A more experienced doctor may consider what one doctor might consider inoperable, relatively easy. However – keep in mind that some doctors may be overly aggressive. Discuss the expected risks of the surgery to make sure your doctor understands your views on how aggressive you want them to be.

Furthermore, while there are over forty-five hundred neurosurgeons in the United States, only one-hundred and twenty five (approximately) are considered experts in the removal of brain tumors, performing these delicate surgeries at least twenty-five times per-year or more. Again, an experienced neurosurgeon can impact the outcome of tumor removal and recovery, making a second opinion with such an expert vital.

To find a brain tumor center near you, go to <http://virtualtrials.com/btcenters.cfm>

What are the survival statistics for patients with brain tumors?

While statistics, given their nature to measure percentages based on populations as a whole and not individuals, are often discouraging to the patient with a brain tumor because they fail to factor many items that must be accounted for on a case-by-case basis such as age, general health, the tumor's involvement and location within the brain, and much more, including but not limited to, access to advanced brain tumor experts.

Surgical technologies and the ability to accurately diagnose a brain tumor have improved dramatically, and on-going, progressive clinical trials are leading the way to new and better treatments. Your ability to challenge "statistics" will greatly depend on surrounding yourself with a medical team that does not fall prey to such "statistics". Try to avoid those within the medical community who have an unfortunate and bleak outlook and may not be current in their understanding of progressive new treatments. Physicians associated with, and in consultation with, leading brain tumor medical centers are your best defense against negative mortality statistics and will enhance your ability to remain positively engaged during your journey through treatment.

Harvard University professor, Stephen J. Gould, wrote about the nature of statistics during his battle against a rare tumor, called "mesothelioma". His essay, "The Median Isn't the Message" can be found at [Steve Dunn's cancer guide](#).

Look at the survivor's stories at www.virtualtrials.com/survive.cfm – look for people with your tumor type to see some people who are leading normal lives. These people prove that no tumor type is completely hopeless. Participate in online and real world support groups to meet others who are going through the same thing as you, but who are many years out and doing well. It is important to see that there are people who do well.

If you want to see the survival statistics, look at:
<http://www.cbtrus.org/factsheet/factsheet.html>
for the average survivals for the entire USA.

Then, look at
<http://www.neurooncology.ucla.edu/Diagnosis.asp?T=GBM&C=2&SC=&R=>
to see the survival statistics if you get the best of care and are treated at a major brain tumor center, in this case, UCLA.

There is one bright side to such disappointing statistics. It allows you the freedom to try experimental treatments early in the course of the disease.

What type of physician-specialist should I see?

Your medical team will likely include several experts who are experienced in various specialties including, but not limited to, neuro-oncology (the medical treatment of brain tumors), neurology (conditions of the brain and spinal cord – the nervous system),

surgery, radiology (MRI/CT), radiation therapy, and pathology (the study of tissue). The make-up of your team will vary depending on the type and location of your tumor, and may include those with a variation of names and cross-specialties, but should always comprise a team experienced *specifically in the treatment of brain tumors*.

A medical (board-certified) **oncologist** treats many forms of cancer; however, not all oncologists are experts in treating brain tumors. As part of your medical team, your general oncologist can assist you with obtaining second opinions and researching available treatment options, but should refer you to a **neuro-oncologist**, experienced in the treatment of brain tumors specifically. Most neuro-oncologists are neurologists, treating disorders of the nervous system. Whether your physician-expert is called a neurologist or a neuro-oncologist is not as important as whether or not they have experience with your type of tumor. It is important that you establish their experience in treating your type of tumor and are up-to-date on advances in both surgery and alternative treatments.

A **neurosurgeon** is someone who performs surgery involving the nervous system, typically specializing in one particular area or system, such as the spine. Not all neurosurgeons are experienced experts in systems relating to the brain and/or the removal of brain tumors. An expert commonly performs twenty-five or more brain surgeries per year to remove tumors. Of the current estimated forty-five hundred neurosurgeons, only about one hundred twenty five are considered experts in the removal of brain tumors to date. Before considering any surgical procedure, it is important to know the experience level of your neurosurgeon, opting for a second opinion (preferably) from a neurosurgeon associated with a major brain tumor center. While some neurosurgeons also practice neuro-oncology and oversee the administration of chemotherapy treatments, most confine their care to surgical therapy and follow-up care.

A **neuro-radiologist** is a specialist in the area of reading MRI and CT scans involving the nervous system. Your MRI or CT scans should always be reviewed by a neuro-radiologist experienced with tumors within the brain.

A **radiation oncologist** specializes in the administration of radiation therapy (solely and specifically) and should work in cooperation with your neuro-oncologist/surgeon to develop an appropriate course of therapy (duration and intensity).

Other specialists you should consider for complementary care throughout your treatment and recovery include:

- Rehabilitation Specialists (physical/speech therapist, occupational therapist)
- Neuropsychologist/Psychiatrist
- Endocrinologist (Internal medicine specialist to monitor blood sugar levels, liver, kidney, and other organ functions and chemistries adversely affected by medication and treatments)
- Ophthalmologist (eye doctor)
- Dentist (especially important prior to chemotherapy)
- Pharmacist
- Tumor board at your hospital of care

What questions should I ask my doctor(s)?

- What are my treatment options?
- What is the timeline for treatment(s)?
- Are there any side effects? What kind?
- Is there short- term and long- term side effects?
- Will my quality of life change?
- Will I function differently?
- Will I see a change in my personality? Appetite? Sleep habits? Memory?

What are brain scans?

Brain scans allow the doctors to get an idea of what is going on inside the head. No scan is 100% accurate, and they are open to interpretation. The more experienced the doctor reading the scans, the more confident you can be in the results. As mentioned elsewhere, it is a good idea to get a copy of the films (or a cd of them) and the report. You can show this to your doctors and make sure they agree on the reading of the scan. If not, get multiple opinions. The copies are also useful to have in case you need a quick second opinion from other brain tumor centers, and in case the originals are lost, which happens more than you would think!

A CT scan (or CAT scan, a computerized axial tomogram) uses x-rays to generate a computer simulation of a picture of the cross section of your head. Usually they inject a contrast agent (a dye) into your arm halfway through the test, to enable the tumor to show up better. A CT scan is readily available and much cheaper than an MRI. A CT scan shows some things very well, such as bleeding into the brain, signs of swelling and is sometimes used for planning surgery and radiation. Since CT scans use x-rays, there is a tiny risk with their use, so they are usually limited to only when absolutely needed, especially in children. If having a CT scan on a child, ask the tech if they reduce the exposure dosage for children. Some older machines do not. If they do not, select a different facility.

MRI (Magnetic Resonance Imaging) uses magnetism and radio waves to create a “picture” of the inside of your head. It is more detailed than a CT scan and usually preferred when trying to diagnose a brain tumor. An MRI will find smaller tumors than a CT scan. A different contrast agent is used for MRIs than for CT scans, so if you had an allergic reaction to the dye used for a CT scan, you can still usually use the contrast agent for an MRI (and visa versa). Sometimes you cannot have a MRI if there is any metal in your body. If there is any metal in your body, tell them when you make the appointment so they can determine if it is safe. Other than the problem with metal, MRIs are thought to be safe and there is no limit to their use. They are expensive, but readily available.

There are many variations of MRI available. Here is a listing of some of the important ones:

- **MRA** (Magnetic Resonance Angiography) shows details of the blood vessels.

- **MRS** (Magnetic Resonance Spectroscopy) shows the chemical makeup of the brain, which can sometimes be used to tell the difference between radiation necrosis, normal brain, swelling and tumor. Sometimes, it can tell the difference between low-grade and high-grade tumors, and pick the best area for a biopsy. It is now also being used to tell if treatments are working much faster than regular MRIs can tell. They are most useful when repeated to compare with the previous scan to see if you are getting better or worse. This is available at most brain tumor centers and is starting to become available everywhere.
- **fMRI** (Functional MRI) – this scan measures blood flow in the brain, and is used to try to map which areas of your brain control which functions. For example, if the tumor is near your speech area, they will ask you to talk while doing the scan, to highlight the areas you use while talking, and to see if the tumor invades that area.
- **Diffusion MRI** – a new variation that measures water movement in the brain. It can be used to determine how well the treatment is working.

See: <http://virtualtrials.com/news3.cfm?item=3061>

PET Scan: (Positron Emission Tomography) – Uses a tiny amount of a radioactive substance injected into your arm, and it shows how metabolically active (how much glucose is being used) each area of the brain is. This can be used to *help determine* (it isn't perfect) the difference between tumor, swelling, radiation necrosis and normal brain. It isn't available everywhere, and is expensive.

Chapter 4: Treatments of Brain Tumors

Treatment Options

Standardized treatments for brain tumors are not unlike those for most cancers: surgery, radiation, chemotherapy and immunotherapies.

For definitions of treatment terms, visit our dictionary at
<http://virtualtrials.com/dictionary.cfm>

Official government information on treatments can also be accessed at:
<http://clinicaltrials.gov>

For additional information on specific treatments, as well as, general information on chemotherapy, radiation, immunotherapy, and surgery, visit: “Noteworthy Treatments” section of our website at:
<http://Virtualtrials.com/noteworth.cfm>
and our video library at
<http://virtualtrials.com/video.cfm>

Surgery is usually the first treatment. In some low-grade tumors, it is curative and no further treatment is needed. Unfortunately, for the majority of brain tumors, additional treatments are needed.

If you were just diagnosed and about to have a surgery, there are a few treatments you should ask the surgeon about, such as Gliadel Wafer and Gliasite Radiation Therapy System. Ask if there are any clinical trials that require a surgery and ask about the possibility of doing a Drug Resistance Assay. You can read about them in later chapters, but for now, just know that you need to ask about these things!

Surgery (for a high-grade brain tumor) should be looked at as an opportunity to use a treatment or do a test that requires surgery, since you don’t want to have an additional surgery just to implant something or get a tumor sample.

Be aware that most long-term high-grade brain tumor survivors have had multiple surgeries. In general, the surgery won’t be as bad as you expect. The worst part may just be worrying about it the night before. There are risks to surgery anywhere in the body, but surgery today is so much safer and easier than it was even 10 years ago. Serious side effects are much less common than they used to be, so don’t let horror stories from the past bother you.

Following surgery, radiation and chemotherapy at the same time is currently the standard of care (for high grade gliomas only). Radiation is given 5 days a week for 6 weeks, and

the oral chemotherapy drug, Temodar, is usually used at the same time. If it is not offered to you, ask why not. IF cost is the barrier, contact us. After radiation is completed, Temodar is usually continued. For GBMs, it is approved for only 6 months following radiation, but in practice, it is used until it either stops working or until it is no longer needed which is determined by no tumor on the scans (MRI and MRS or PET) for a few months.

Some brain tumor centers add a second (and sometimes a third) drug to the Temodar to try to make it work better. Some of the drugs being used are: Thalidomide, High Dose Tamoxifen, Accutane, and Celebrex.

For an overview of Temodar, go to:
<http://Virtualtrials.com/temodar>

For a look at the research reports on Temodar and combinations, look at the “Review of Temodar” and the “Update to the Temodar Review”, both in the Temodar section of our website.

In some cases, if there is still tumor on the scan after the “standard” radiation, an additional dose of a much focused form of radiation, called stereotactic radiosurgery, may be tried. If these treatments do not work, (or they may be considered instead of the standard therapy), then other therapies are considered.

There are 2 general classes of treatment: “FDA Approved” or “Experimental”.

- “FDA approved” treatments have been deemed “safe and effective” for at least 1 disease. Not necessarily for brain tumors. If they were not approved for brain tumors, your doctor may still prescribe it for your brain tumor. This is called “Off Label Use”. Many drugs used commonly for brain tumors are used off label. Although legal, and easily available, you sometimes have trouble getting your insurance company to pay for off label usage because they argue it is experimental. In such cases, know that you can fight the insurance company’s denial. You should enlist your neuro-oncologist to help get it approved by your insurance company.
- “Experimental” – The treatment has not been approved yet, and may be hard to obtain. A clinical trial (defined below) is the best way of trying experimental therapies, as the doctors will watch you very carefully for signs of side effects. Be aware that there is a mechanism for using an experimental drug outside of clinical trials, but it is only for those who do not qualify for the usually rigid entrance criteria of clinical trials. This is called “Compassionate Usage”. People in clinical trials seem to do better than people who choose not to participate. This may be due to the fact that you are watched much more closely while in a trial than when not in a trial. Also, once the cure is actually found, the first people to get it will be those in the clinical trial for it. This has happened with other types of cancer, and it will happen for brain tumors, hopefully some day soon.

Clinical Trials

Clinical trials are often referred to as experimental treatments, which are providing new inroads to extended life expectancy and an improved quality of life for many patients. Although well designed, clinical trials are dependent upon patient participation and not all doctors are aware of the many trials available. Understanding current availability of

clinical trials require time and due-diligence, something many physicians lack. I hate to say this, but some doctors are reluctant to refer you to other treatment centers. You must search out the appropriate trials available for your specific tumor-type, always advocating in your own best interest towards a cure.

A complete introduction to clinical trials can be found at:

[Terry Armstrong's clinical trials summary](#)

Understanding Clinical Trials

Most clinical trials are designated as phase I, II, or III, and are based upon specific questions that a particular study is seeking to answer. In most cases, the following is true:

- Phase I – examination of a new drug or treatment in a small group of people (20-80) for the first time to evaluate its safety, determine a safe dosage range and identify potential side effects.
- Phase II – the study drug or treatment is given to a larger group of people (100-300) and further measured for effectiveness and safety. Dosage of medication may be increased to determine toxicity levels.
- Phase III – the study drug or treatment is given to large groups of people (1,000-3,000) to confirm its effectiveness within a sizable population, monitor side effects and toxicity levels, compare it to the standard treatments, and further determine safety.

These phases are defined by the Food and Drug Administration in the Code of Federal Regulations.

Why should I consider participating in a clinical trial?

For most types of malignant brain tumors, there is no cure. Clinical trials provide access to some of the newest and most promising treatments that are still being investigated in areas for which there are no curative measures otherwise available, or for which a better delivery of therapy with fewer damaging side effects may be possible. In many cases, these trials, guided by experts in their field, may represent your best possible chance for survival, or perhaps, an opportunity for a better quality of life. By participating in a clinical trial you help researchers take one small step, or perhaps even a giant leap, closer to a cure. Aside from helping yourself, your experiences help advance the state of the art in the field, which may lead to better treatments in the future.

When should I consider a clinical trial?

The decision of when to participate in a clinical trial varies among patients and should be discussed with your doctor. Some patients and physicians feel more comfortable exhausting traditional treatment avenues first. Others choose to participate in trials from the onset of diagnosis. You may wish to discuss certain points of progress (or lack of) with your doctor as a guideline to help you with your decision. Obviously, if you have a low-grade tumor that has good treatments available, you would be less likely to try something experimental. If you have a high-grade tumor where the expected outcome of the standard treatments is not acceptable to you, it is easier to make the decision to try something experimental.

Clinical trials each have their own set of requirements that might include the age-range of participants, location of the tumor, grade and/or type of tumor, or a specific degree of stabilization before a patient is admitted to the trial. Some clinical trials are specific to patients experiencing a recurring tumor, rather than a first-time diagnosis. Whether or not you decide to wait or move forward, it is important to research available trials early for your specific type of tumor and know if, or when, you might qualify in advance.

One thing to keep in mind is to plan ahead and think through a large range of contingencies. Some treatments will disqualify you from trying some experimental treatments. In such a case, you will usually not have enough real data to make an informed decision. In the old days (over 5 years ago), it was an easy decision – the standard treatments had so little hope that you had nothing to lose. The standard treatment (surgery with Gliadel, radiation with Temodar then Temodar + another drug) has progressed to the point where you now have a difficult decision to make.

How do I assess a clinical trial?

The best way to evaluate if a clinical trial is right for you is to speak with your primary physician, your neuro-oncologist or surgeon, and other members of your health team including those from whom you have turned to for second opinions. You might also contact one of the major brain tumor centers for additional insight to a specific clinical trial. You should also consult with the physician in charge of the trial. It is always helpful to know what other trials the charge-physician has participated in, or is currently participating in. Lastly, it is important to ask any physician not in favor of your participation, why not? What would they recommend instead, and why?

Although individual cases are meaningless statistically, the experiences of others may help give you enough information to choose between two treatments that are otherwise a toss up. You can find these individual experiences in the online support groups, real world support groups and the brain tumor virtual trial results.

How do I find clinical trials?

Our website, <http://Virtualtrials.com>, offers some of the most current information available regarding clinical trials. We offer many ways to find a trial – see the Appendix for a listing of the ways to search. Also check <http://clinicaltrials.gov> – they have some trials that we do not have listed yet, and we have some that they don't have. Together, most of the important trials are listed!

Medications

In the treatment of brain tumors, not unlike any other acute or chronic illness, a variety of medications are used to combat symptoms, such as pain, fatigue, swelling and seizures. They may include antibiotics, steroids, analgesics or narcotics and anti-convulsants. It is necessary to take responsibility for your medications to ensure your safety.

As your medical team will be made up of physicians from various specialties, all of whom may prescribe different medications or alter dosages in the context of your care, it's vital that you keep ongoing and accurate (up-to-date) records in your treatment binder regarding your medications, including:

- Medications you're currently taking (including dosages) and who is responsible for monitoring you (prescribing physician) or providing refills. This information can be very helpful to a caregiver seeking information or assistance on your behalf.
- Medications you have taken in the past, noting their value (i.e., was most helpful for sleep)
- Medications discontinued due to negative side effects.
- Any allergic or adverse reactions, mild or otherwise – note them in **RED**.

Always:

- Ask your doctors to review your list of current medications prior to prescribing something new.
- Check to ensure that the recommended drug is covered on your insurance plans drug formulary, or if you'll need a prior authorization.
- To avoid receiving the wrong medication at the pharmacy (a growing concern), write down the specific medication and dosage as stated on your prescription **before** submitting it to a pharmacist and compare this information to the label on the bottle to ensure it is the same drug as stated on the prescription.
- Your prescription might be filled with a generic substitution if your doctor did not prescribe, "as written". If the medication you receive is different than what was written on the original prescription by your physician, ask the pharmacist. Also ask the pharmacist for his thoughts on the generic. Most generic drugs are ok to use, but for some drugs that have a very narrow effectiveness range it may be worthwhile to pay the extra for the brand name or insist on the same brand of generic each time.

Whenever possible, having all your prescriptions filled through a single pharmacy source can be a safeguard against medical errors, preventing adverse drug interactions, as most pharmacies now utilize computer systems that automatically flag dangerous interactions based upon your previous medications. Should your physician fail to recall a particular medication that might present a problem, chances are your pharmacist will catch it. Still, asking your physician(s) to review your medication sheet in your treatment binder – each and every time a new drug is prescribed is an important, life-saving step.

It's important that you read and understand the side effects and drug interactions of all the medications you are prescribed. Additional information regarding your medications can be found in the Physician's Desk Reference (PDR) found at your local library, or through online sources, such as [RXMED](#) and [Drugstore.com](#), including rare side effects not covered within this guide.

Common Medications

The following is a general list of medications commonly used to treat symptoms and/or conditions caused by a brain tumor itself, or resulting from surgery and/or other standardized treatments of brain tumors. Many of the significant/common side effects regarding a particular medication are noted, but may be incomplete. Your physician may recommend medications not covered within this general guide. You are advised to thoroughly discuss and understand all the benefits and side effects with your physician before a prescription is issued. Physicians are often creatures of habit – ask about alternative medications and why he/she would choose the recommended medication over another. This is a general overview. Always ask your doctor before taking anything, even over the counter pain medications.

Pain Relief

Because the brain itself does not feel pain, studies show that physicians treating patients for brain tumors often overlook pain. However, pain, as a by-product of disease or due to complications from surgery or other forms of treatment, is very real and deserves real attention. Headaches from brain inflammation or tension, scalp sutures, muscular pain and hairline fractures due to steroid therapy, and pressure points on arms and hips from extended bed rest can all attribute to pain and require medication. Pain left untreated can slow healing, deplete emotional reserves, exacerbate depression and sleep deprivation, and detract from your quality of life.

Mild Pain -- can usually be managed with Tylenol or Advil (Note that aspirin can affect how fast your blood clots, which may be bad if you need surgery, or good as it prevents blood clots. Always ask your doctor about it first!).

Moderate Pain -- slightly more powerful prescription medication, such as Percocet, Darvoset, and Percodan (which contains aspirin), can be taken as directed by a physician.

Severe Pain -- Codeine, Vicodin, Oxycodone and stronger, morphine-type medications are typically long acting and taken less frequently. Many also come in “patch” form for slow absorption and continuous relief. Ritalin (used to treat attention-deficit disorders), taken in small doses with pain medication, can increase the narcotic effect (enhancing pain relief) while reducing the drowsiness commonly associated with these drugs. Ritalin has also been shown to benefit patients who suffer from fatigue.

According to the pharmaceutical disclosure (package insert) for morphine, this drug should not be used in patients with brain tumors, however, it is still commonly used and the benefits may outweigh the risks when you are in severe pain. Discuss any concerns you might have with your physician.

Steroids

Steroids are powerful anti-inflammatory drugs typically prescribed to reduce swelling in the brain (cerebral edema) before and/or after surgery, during radiation treatments, or to relieve symptoms such as memory loss and limb (arm/leg) weakness caused by brain swelling. While common, swelling can be harmful if excessive and must be controlled.

Synthetic steroids such as Decadron and Hexadrol (common brand names for dexamethasone) are man-made hormones similar to cortisol, which is produced naturally by your body. Taken orally, these steroids create higher levels in the body than what is normally secreted, reducing inflammation, but also causing the body to temporarily stop natural production on its own. For this reason, it is very important to “wean” yourself (cut back slowly) when stopping oral steroid therapy. Always follow your physician’s recommended schedule for reducing dosages. During this reduction period, your body will slowly come back “on line” and begin to produce normal cortisol levels again. You should never abruptly stop taking steroid medication, as in extreme cases, going cold turkey can cause sudden death, as the body is not yet ready to resume full production of cortisol on its own, a necessary and vital hormone.

While the benefits of steroids are undeniable, often unmatched by any other medication, they are not without short and long-term side effects.

- Long-term side effects can include (but are not limited to):
- Diabetes
- Muscle pain/weakness
- Osteoporosis (bone loss) leading to fractures
- Susceptibility to infections.

Short-term effects include:

- Increased appetite, weight gain and indigestion
- Swollen or “moon-faced” appearance
- Stretch marks, rash/flushing of skin and acne
- Increase in blood sugar

- Brittle bones
- Depression, behavioral changes
- Anxiousness/paranoia
- Suppressed immune system

Other oral steroidal therapies include prednisone or prednisolone. While not as strong as dexamethasone (Decadron), side effects are generally the same, although perhaps not as severe in most cases.

Xerecept is a new medication currently being tested in comparison to dexamethasone (Decadron) for the treatment of brain swelling (edema), thus reducing pain and adverse neurological symptoms, most commonly, seizures. For those patients who require high doses of steroidal therapy to reduce swelling, Xerecept *might* prove equally (or more) effective without the side effects of current steroid therapies. Developed by Neurobiological Technologies, Xerecept is currently in Phase III of clinical trials, open to patients with malignant brain tumors who require high doses of dexamethasone.

Anticonvulsants

Roughly 30-40 percent of patients will experience some level of seizure activity and require medication to reduce electrical responses in the brain. Due to the location or size of some tumors, many neurosurgeons will prescribe anti-seizure medication as a matter of routine before, during and/or after surgery when the risk of seizure is considered high. In the past, brain tumor patients were put on anti-seizure medications routinely for life, but since they can have a lot of side effects, ***many doctors now try to do without these drugs until seizures occur.***

In some cases, a seizure will appear as something slight and quick – muscle or eye twitching, or a sense of being “out of the moment” mentally and/or physically for a brief time; a blank stare or sudden pause without response. These are called Focal Seizures. For others, seizures will involve full body activity, often categorized as Grand Mal seizures.

Most anti-convulsants share common side effects, such as fatigue and dizziness, so for obvious reasons you may be restricted from driving a car or operating dangerous equipment while taking anti-seizure medications, even when seizures have not been documented or have subsided. Other medications and certain foods can prevent proper absorption, so frequent blood draws for proper dosage and serum levels are necessary.

Phenytoin, commonly prescribed under the trade name, Dilantin, is the most commonly used medication to prevent full-body seizures in high-risk patients. Individuals metabolize Dilantin differently; so periodic blood levels are taken to ensure dosages are adequate and stable. Side effects of Dilantin include, muscle fatigue, dizziness and loss of coordination, as well as, tooth decay and gum problems. Regular dental checkups and extra attention to oral hygiene are advised.

Long-term use of Dilantin can cause a decrease in certain nutrients, such as folic acid and calcium. Ask your physician about supplements if necessary. Dilantin can also interact with other medications, including over-the-counter drugs, birth control pills and herbal supplements. It's important to disclose all the medications you take to your physician and pharmacist. Dilantin can also make some chemotherapy drugs less effective.

Neurontin (trade name for gabapentin) carries similar side effects as Dilantin, as well as, double vision, tremors and involuntary eye movements. While Neurontin has fewer drug interactions than Dilantin, it does interact with certain antacids, such as Maalox.

Tegretol (carbamazepine) is an anti-convulsant that is also prescribed in the treatment of manic depression and other psychiatric disorders. Effective in its ability to control Grand

Mal seizures, Tegretol must be monitored closely with frequent blood levels, as in rare cases, it may suppress bone marrow production. You should report any onset of a rash to your physician immediately. Tegretol also reduces or increases the effects of many medications. Double vision, pounding or slow heart rate, and nausea are noted side effects with this drug.

Depakote and Depakene (trade names for valporic acid or valproate) are commonly prescribed for Focal seizures and require periodic blood levels to ensure adequate dosage and guard against liver damage. As Depakote interacts with many medications, make sure your physician reviews your current medication list (including over-the-counter and herbal supplements) at the time of recommendation.

Phenobarbitol (a barbiturate and strong depressant), or Primidone are less frequently prescribed, as the effectiveness of other anti-convulsants can be more easily achieved without the potentially addictive qualities.

Keppra (levetiracetam) is a newer anti-convulsant drug. Sometime it is used alone and sometimes for difficult cases it is combined with other drugs. Keppra does NOT interfere with chemotherapy drugs.

Anti-Nausea

Nausea is common with brain tumors, as both a part of the disease process itself and of course, a by-product of radiation and chemotherapy treatment. But the medication available to treat nausea depends on the cause. Medications to control nausea following chemotherapy and radiation are typically short acting, while others are more suitable for generalized conditions between treatments.

Zofran (trade name for Ondansetron) is used to control nausea caused by chemotherapy or radiation specifically, usually administered by IV prior to treatment and can be taken orally after treatment, if necessary. Effective for only a few hours, Zofran is limited to nausea caused by chemotherapy and radiation only, and is not to be taken for motion sickness or other generalized conditions related to nausea. While mild in nature, side

effects include headache, fatigue, diarrhea or constipation and may exacerbate pre-existing liver disease.

Kytrill is similar to Zofran in both treatment administration and side effects, although it may also cause abdominal pain. It lasts up to 12 hours.

Compazine (trade name for Prochlorperazine) is a commonly prescribed medication for the treatment of generalized nausea, given either orally, via IV, or as a suppository. Compazine belongs to a family of antipsychotic agents called “phenothiazines”, and may cause drowsiness, low blood pressure, dizziness, constipation, dry mouth, blurred vision and sensitivity to light. While effective in the management of nausea, Compazine should not be used in conjunction with alcohol, may interact with other medications, and could potentially cause an irreversible condition called Tardive Dyskenesia; involuntary movements or twitches of the face, tongue or arm muscles. It is important to discuss possible interactions and side effects with your physician.

Anzamet is a new anti-nausea drug currently being used with success, given prior to chemotherapy. In some patients, a combination of Anzamet and Decadron prior to chemo works in cases when the older drugs don’t provide enough relief.

Haldol is another antipsychotic medication used to control nausea with similar risks and side effects to those of Compazine. Both Haldol and Compazine should not be taken without a detailed discussion with your physician.

Transderm Scop is a seasick drug, which can sometimes be used for nausea. It is a patch that is applied to the skin and works for 3 days per patch. A main side effect is dry mouth, which can be a benefit when the patient has trouble swallowing and produces too much saliva.

There are also many alternative treatments. Some patients report that acupuncture, biofeedback and hypnosis provide nausea relief with no side effects and are much cheaper than most commonly used drugs.

Anti-Depressants

Being diagnosed with a brain tumor alone is enough to create overwhelming anxiety and stress. It’s important to understand that during the course of treatment, intense and seemingly “over-emotional” reactions, such as acute depression, sexual dysfunction, sudden outbursts, and visual or audio hallucination may be the result of medication or a condition stemming from the tumor itself, not necessarily an emotional response. It’s important to communicate these emotional changes with your physician and seek out proper assistance and guidance to help you distinguish the many moods of treatment and recovery, and to help you cope.

A psychiatrist is a medical doctor who can assist with those conditions that are tumor-related (impairments directly caused by the presence or treatment of the tumor itself) that may require drug therapy. Psychologists can provide help with coping difficulties and

mild depression due to issues of long term care, financial strain or the stress placed upon family and other important relationships. Make sure that the psychiatrist is experienced in treating brain tumor patients. Ask your neurosurgeon to refer you to one.

Common anti-depressants include Zoloft, Paxil and Prozac, all of which are from a class of drugs called “selective serotonin reuptake inhibitors”, or SSRI’s. Side effects may include sleepiness, tremors, diarrhea, nausea, insomnia, increased sweating, weight loss and decreased sexual ability. Side effects may be reduced when taken with meals; however, Zoloft in particular, should always be taken with food. In some rare cases, anxiety and depression may worsen while taking SSRI’s and should be reported to your physician immediately. Don’t let the risk of side effects stop you from trying these drugs, if needed. People report a remarkable increase in quality of life when these drugs work.

Herbal remedies may be of some benefit; however, herbal mixtures can adversely interact with other prescription medications and should always be discussed with your physician for safety and adequate dosing information. If you are thinking of taking Hypericin, make sure to ask your doctor first, as it can interfere with other drugs.

Anti-Coagulants

Brain tumor patients are at a higher than normal risk for developing dangerous blood clots. Blood clots commonly start in the legs as Deep Vein Thrombosis (DVT). Symptoms of DVT may include pain, tenderness, swelling or discoloration of the affected leg, and skin that is warm to the touch. If you develop these symptoms, you must call your doctor and get it checked quickly. Left untreated, the blood clots can break away and travel to the lungs where they cause a pulmonary embolism, which may be rapidly fatal. Symptoms of a pulmonary embolism include sudden shortness of breath, chest pain (worse with breathing), and rapid heart and respiratory rates. If you develop any of these symptoms, you must go to the emergency room immediately.

Medications called anti-coagulants help to thin the blood and reduce clotting, the body’s normal response to help stop bleeding. Heparin (lovelox) is an anti-coagulant that is given IV, usually for a short period of time to prevent or treat blood clots. Warfarin (commonly referred to as Coumadin) is an oral medication that can be taken over a long period of time to prevent blood clots. Aspirin is a milder blood thinner, which some doctors recommend to prevent blood clots.

While taking anti-coagulants, normal cuts and scrapes may take longer to stop bleeding or heal, and there is an increased risk of the tumor bleeding into the brain – so these drugs are a double edged sword – and should be taken exactly as prescribed.

Warfarin interacts with many medications and should be discussed thoroughly with your physician before treatment. Your doctor will also order periodic blood tests to ensure appropriate medication levels are maintained.

Plavix is another commonly used drug that prevents clotting.

It's important to note that changes to your diet can have a negative effect on the blood thinning measures of anti-coagulant medication. Suddenly increasing foods such as spinach in your diet can adversely affect bleeding times. The sudden introduction of fish oil capsules (Omega 3's) as a dietary supplement can also alter bleeding times. While there is no need to eliminate spinach and other healthy items (including supplements) from your daily routine, you are advised to maintain your normal diet and not increase (or decrease) items significantly, or add new supplements without discussing them with your physician. This is **not** the time to begin a new diet for weight loss without consulting your physician.

It is always a good idea to wear a medical alert bracelet informing medical personnel that you are taking anti-coagulants in the case of an emergency. They are widely available in most retail pharmacies and on the Internet, inexpensive, and an important safeguard for your health.

Neurosurgery

Surgery is performed to improve neurological function, confirm your diagnosis by means of a biopsy ("open biopsy" or "Stereotactic biopsy"), or to completely ("total resection") or partially ("sub-total resection" or "debulking") remove the tumor. With a resection, you also get a biopsy of the sample removed. You should ask your surgeon for a copy of the pathology report. You can easily (but it may be expensive – check first) get a second opinion on the reading of the pathology slides. There is a lot of interpretation put into the reading of the slides, and this is the single most important test you will ever have in your life, so it may be worth the money to double check it. Best of all, getting a second opinion doesn't involve any pain – and can be done by mail – no need for traveling.

For some benign tumors, surgery may be curative. For the malignant tumors, surgery may relieve symptoms of too much pressure in the brain and allow time for other treatments to work. Malignant tumors can grow so fast that without surgery, other treatments might not have the time to work. Surgery is also an opportunity to try a treatment that requires direct access to the brain.

Surgery is performed by a neurosurgeon; however, a general neurosurgeon may not have adequate experience in the removal of brain tumors, and may be less informed regarding current treatment therapies. Most neurosurgeons do not see many brain tumors. You need to find one that specializes in brain tumors. Check out their website and make sure that "brain tumors" is listed as one of their main areas of expertise.

An "expert" is defined as one who performs a minimum of twenty-five per year; typically these neurosurgeons are associated at some level with major brain tumor centers. Studies indicate that major brain tumor centers and/or surgical teams that perform fifty or more surgeries a year exhibit better survival rates and fewer complications.

"Brain surgery" sounds like a very scary thing. It is. But as previously mentioned, it is now much safer and easier than ever. Advances in 3-d computer guided imaging, intraoperative imaging with ultrasound or MRI, and small endoscopes allow surgeons to

remove many tumors that used to be considered inoperable. There are still some tumors that because of the size or location are too dangerous to remove, but the limits are shrinking every year. If you are told that your tumor is inoperable, get another opinion.

Radiation Therapy

Radiation therapy is performed under the care of a Radiation Oncologist or neurosurgeon typically after surgery or in cases where surgery is not an option due to the location or size of the brain tumor. The tumor and a small margin are usually targeted by a powerful beam of radiation. The radiation disrupts the DNA of the cells that are reproducing.

Tumor cells reproduce much more often than normal brain cells, so they are affected more than normal cells. Normal cells are also better able to repair the damage from the radiation than tumor cells. We take advantage of this by breaking up the course of radiation into a number of smaller treatments instead of one big treatment (except for a special form of radiation called “stereotactic radiosurgery”, see below). This is called “fractionation”, and gives the normal cells time to repair themselves, but not enough time for the tumor cells to repair themselves between treatments. A typical course of radiation involves a few minutes of treatment 5 times a week for 6 weeks. It has been shown that adding the oral chemotherapy drug, Temodar, to radiation makes the radiation work **much** better. Ask your doctor about it.

Side effects of radiation can range from mild to severe and include skin burning and peeling, swelling (edema), diarrhea and nerve damage. There are many types of radiation:

Whole Brain Radiation: Radiation is applied to the entire brain. This is usually only used when there are multiple tumors, especially with metastatic brain tumors. In the past, it was used for all brain tumors, but more focused forms of radiation are now usually used.

Conformal 3-D radiation – targets the tumor and a small margin with “conventional” external beam radiation. This spares the normal brain from radiation damage, and is the standard of care now for most brain tumors.

Interstitial radiation therapy (also known as brachytherapy) - this is delivered directly to the tumor bed by the implantation of radioactive material. It may be in the form of radioactive seeds, which are implanted permanently or temporarily; via the Gliosite Radiation Therapy System, which is a balloon implanted into the tumor cavity which is later filled with a radioactive liquid for a few days then removed. The advantages are a much higher dose of radiation exactly where it is needed. The disadvantage is that surgery is needed to implant these devices.

A variation on brachytherapy is targeted administration of a radioactive substance combined with a monoclonal antibody. The antibody seeks out the tumor cells and drags the radiation to where it is needed. This is experimental, but shows a lot of promise.

Boron Neutron Capture Therapy – this is a variation on conventional external beam radiation and is experimental in the USA – but available in other countries. A neutron

beam – produced by a nuclear reactor – is used. The beam itself does not harm the normal brain cells or the tumor cells. A special boron compound is injected into the patient a few hours before the treatment. This special compound builds up in the tumor cells to a greater extent than in normal cells. When the neutron beam hits this boron compound, it creates a reaction, which kills the cell. It is usually a one-day treatment. It works great in theory and lab animals, but so far hasn't proven to be better than standard radiation. There is much work going on to find better boron compounds, perhaps combined with neural stem cells, to greatly increase the ratio of the boron compound in tumor cells as compared to normal cells. This holds promise to become a major breakthrough.

Stereotactic Radiosurgery (SRS) - While there is no “knife” or incision to expose the brain involved with radiosurgery, rather a precise, high-dose beam of radiation, it is considered “surgical” because of the degree of change that transpires following any radiosurgical procedure.

Radiosurgery can involve one treatment session, or several (fractionated) sessions over a period of several days or weeks, assisted by computer-aided planning. Radiosurgery delivers a much higher dose of radiation to the target than conventional radiation. In some low-grade tumors it can be curative. For metastatic tumors, there is a good chance that stereotactic radiosurgery can permanently control individual tumors. SRS is also sometimes used as a boost at the end of conventional radiation or for small recurrences.

There are many different machines that can be used for stereotactic radiosurgery: Gamma Knife, Novalis System, Linac, Cyberknife and many more. Each has advantages and disadvantages, which is beyond the scope of this article. Just know that if you are told your tumor is too large or the wrong shape for SRS, get another opinion from a doctor who uses a different machine. For example, the Gamma Knife has a size limit of 3 or 4 cm, which the other tools do not have.

For more information, look at our video library at <http://virtualtrials.com/video.cfm> and look through all of the radiation lectures.

Chemotherapy

Chemotherapy is the use of powerful drugs to kill tumor cells. These drugs work in several ways, each unique to the type of treatment recommended, by either a) destroying the tumor's DNA directly, b) restricting the tumor cell's ability to divide, grow and invade healthy tissue, or c) by blocking the blood supply to the tumor itself and inhibiting the growth of new blood vessels that would otherwise, feed the tumor.

Traditionally given in the form of pills that are taken by mouth, or delivered through an intravenous or sometimes called an IV, new forms of delivery to the tumor site specifically are showing great promise, reducing the harmful side effects to healthy, disease fighting white blood cells. Two areas of advanced treatments include injecting the

drug into the tumor (Intratumoral injection), pumping the drug into the tumor under pressure for a better distribution (convection enhanced delivery) or by surgically placing a drug-wafer into the tumor cavity that dissolves over time.

Chemotherapy can be done prior to, during and/or after radiation therapy. For high grade gliomas, the standard of care now is to have surgery first, then radiation and chemotherapy with Temodar at the same time, followed by at least 6 months of Temodar.

Common side effects to chemotherapy include, nausea, weakness and fatigue, dehydration, and low white blood cell counts, which increases the risk of infection. Because a simple cavity or early gum infection (gingivitis) can quickly escalate into an acute infection for the patient undergoing chemotherapy, patients are advised to obtain a thorough dental examination prior to beginning chemo and follow up frequently with your dental care team.

FDA Approved Chemotherapy Drugs – Note: most of these are not approved for brain tumors, but are used “off-label”.

Temodar: Also called temozolomide and temodol – an oral chemotherapy. This is the most popular drug for brain tumors – and is FDA approved for brain tumors.

For details, see <http://virtualtrials.com/temodar>

PCV: a combination of Procarbazine, CCNU and Vincristine. Part oral, part intravenous/IV. This was the most popular treatment before Temodar came along. It is now used as a second line treatment for when Temodar doesn't work, and sometimes as a first line treatment for a type of tumor called an oligodendroglioma. There is a test available to tell if an oligodendroglioma will be sensitive to PCV.

For details, see <http://virtualtrials.com/pcv.cfm> and <http://virtualtrials.com/oligotest.cfm>

CPT-11: An intravenous/IV chemotherapy approved for use in colon cancer, but being tried for brain tumors. There are early rumors that adding the drug Avastin to the CPT-11 may be a breakthrough.

For details on CPT-11, see <http://virtualtrials.com/cpt11.cfm>

High Dose Tamoxifen – this is approved for use to prevent recurrence of breast cancer, but is used in much higher doses for the treatment of brain tumors. Only a small percentage of brain tumor patients respond to this, but when they do, it can sometimes work miracles. It is oral with little side effects such as a small increased chance of blood clots, and puts females into menopause immediately. Some doctors add this to other treatments so no opportunity is lost. Others use this as a last resort. There is a report that inducing a hypothyroid state in the patient makes Tamoxifen work better.

For details, see <http://virtualtrials.com/tamoxifen4.cfm>

Thalidomide: this is another oral drug, but works in a unique way – it suppresses the formation of new blood vessels, which a tumor needs to grow. The major side effect is fatigue. Some doctors prescribe it in addition to other treatments.

See <http://virtualtrials.com/thalidomide.cfm>

VP-16 (also called Etoposide) – an oral chemotherapy with minimal side effects. It is now used as a second line treatment for high-grade gliomas.

For details, see <http://Virtualtrials.com/vp16.cfm>

BCNU and CCNU: These are the oldest, but still useful, treatments for brain tumors. BCNU is given intravenous/IV and CCNU is usually given orally. They are basically different forms of the same drug. Some doctors use these instead of Temodar, or alternating with Temodar. The major side effect is pulmonary fibrosis – so a breathing test is required before starting and frequently after. BCNU is making a comeback in a different form – as directly placed into the tumor bed in the form of wafers such as Gliadel.

Anti-Angiogenesis Drugs

Avastin is the first approved for brain tumors in this class, but there are a few others used off label or in clinical trials. Avastin sometimes has an immediate (within a month or 2) remarkable impact on the MRI scans and patient's well being - at least for a while. Research is under way to figure out how best to use it so that this effect lasts a long time.

Gene Therapy

Experimental treatments using gene therapy are currently being studied for patients with recurring malignant tumors who have already completed traditional treatment options, such as surgery, radiation and chemotherapy. Through the use of gene-altering drugs, researchers hope to alter the genetic makeup of tumors, restricting their ability to divide and grow at a cellular level. No gene therapies are currently approved for brain tumor use in the USA, but there is a gene therapy for brain tumors approved.

For more information about gene therapy, visit:

<http://virtualtrials.com/outsidelink.cfm?u=http://www.introgen.com>

Immunotherapy / Vaccine Therapies

White blood cells are your body's innate army of defense against disease, foreign invaders (bacteria, viruses, fungi), and support of overall immune health. For reasons not

clearly understood, the body's own white blood cells do not recognize the invasive, abnormal cellular structure of a brain tumor, attacking it as they would other threatening entities. Vaccine therapies and other immunotherapies such as "IL-13 / LAK Cells" try to fool these special white blood cells into recognizing that the tumor doesn't belong – so that they attack and kill the tumor cells, and don't hurt the normal cells.

For more information on immunotherapy, visit: <http://www.virtualtrials.com/vaccine.cfm>

Stem Cells –Glial cells derived from neural stem cells specifically, hold the key in the minds of many to not only a cure, but also provide the ability to rejuvenate important neurological functions within the brain by giving birth to new nerve cells. Much in the way that bone marrow stem cells repopulate an immune system whipped out by radiation, neural stem cells can be "seeded" within the brain, effectively adopting the makeup and function of whatever cell type is needed. In studies involving mice, human neural stem cells matured into the type of neuron and glial cells appropriate for the particular area of the brain they were introduced, making repair of injured brain functions possible in the future.

More importantly, neural stem cells have the unique ability to migrate to brain tumor cells, no matter where they are located in the brain, making them a promising building block in the search for the cure. Researchers are trying to harness this amazing property, by adding a payload to these stem cells that can kill the target by creating a neural cell "smart bomb", if you will, which would be able to seek out and destroy tumor cells without harming normal cells.

Tumor Treating Fields – this is an exciting new treatment involving a device that treats the tumor with electrical fields transmitted via electrodes that are applied to the scalp. No needles, pain or nausea involved. It is in a phase 3 clinical trial now, so it is too early to tell how effective it is, but it is worth looking into. It is for people with recurrent or progressive glioblastoma multiforme.

Watch the video on it at <http://virtualtrials.com/video8.cfm?clipid=200702>

Chapter 5: Sex & Fertility

Effects of Treatment and Medication

For the patient undergoing treatment for a brain tumor, a reduction in sexual drive and/or the inability to enjoy normal sexual activity is common. Deciphering the origins of such can be difficult, however, as many factors can, and do, contribute to the problem. While surgery causes postoperative fatigue and temporary physical weakness, chemotherapy and radiation can greatly impact and reduce your desire for sexual stimulation due to adverse effects on hormone production. So too can the medication prescribed for brain swelling, seizures, nausea, anxiety and depression. Physical changes, such as hair loss and weight gain can further undermine one's sense of attractiveness and desirability, deepening the emotional separation from sexual contact. Individually or in varied combination, these side effects to treatment create, in some cases, a daunting puzzle that requires patience and communication to piece together.

Complicating the patient's ability to understand (or prepare for emotionally) the effects of treatment as it relates to a decrease in libido, is often the health professional's discomfort in discussing sex with the same openness and honesty that might accompany a discussion regarding nausea, diarrhea or even one's expectation for recovery. For this reason, patients often find discussing ongoing issues of intimacy beneficial with other members of their care team, such as a counselor or neuropsychologist who, as a medical doctor, is familiar with the impact of brain trauma and the effects of medication, as well as, the emotional toll often carried internally by the patient. While most treatment-associated dysfunction or lack of desire is temporary, being able to openly discuss difficulties and options for sexual intimacy with your partner and medical team is key to managing the extent of disruption, treatment options, and your ability to resume normal sexual relations after treatment.

Depression is common among brain tumor patients; a condition often controlled with medication (antidepressants) called SSRI's (selective serotonin reuptake inhibitors), such as Paxil or Zoloft. However, these medications can reduce libido by interfering with sexual desire. A simple change in dosage or medication may aid in restoring libido and should be discussed with your prescribing physician.

Birth Control

It's important to discuss potential effects of your treatment with both your tumor physician and your gynecologist if you take oral contraception – birth control pills. Chemotherapy may halt menstrual periods temporarily, but precaution against pregnancy must be maintained due to the devastating effects of chemo to an unborn fetus. Some chemotherapy medications, as well as anti-seizure drugs, can interact with the

effectiveness of birth control pills. A thorough discussion with your medical care team is essential.

Sex, Surgery and Radiation/Chemo Therapy

In most cases, there are few reasons why one could not have sexual relations while having radiation therapy or post surgery, however, you should always consult your physician regarding any precautions they would recommend regarding strenuous activity, including sex. Fundamentally, both radiation and surgery can result in fatigue, making any strenuous physical activity difficult. As your strength returns, normal sexual activity can resume.

Likewise, unless your physician specifically warns you against sexual activity while undergoing chemotherapy, normal relations are limited only by the precautions associated with the drugs themselves. Chemo drugs can be transferred through sperm, and in some cases, can be harmful to sperm thus damaging to a fetus. Condoms should always be used during both intercourse and oral sex to eliminate the possibility of exposing another to the harmful effects of chemotherapy drugs, either vaginally or orally. As sperm can live for a period of up to three months, it's important to continue with condom safeguards during this time. Although dry orgasms can occur naturally on occasion as men age, chemotherapy can also cause this syndrome to occur. The lack of ejaculation during orgasm it is not cause for alarm and should have no adverse effect on pleasure.

Women must take extra precaution against pregnancy during chemotherapy, as birth defects can result in a developing fetus from chemo drug exposure. Always discuss your method of birth control with your doctor, specifically any possible reduction in the effectiveness of your prescribed oral contraception. Chemotherapy can also dry out mucus membranes within the nose, mouth and vaginal area. Non-petroleum, over-the-counter vaginal lubricants, can assist with the temporary dryness associated with chemo, relieving the discomfort and pain most often experienced during sexual relations. Petroleum-based products can irritate the vaginal area, as well as, weaken condoms, so they should be avoided.

Additional resources are available that can help you overcome issues of intimacy caused by fatigue, pain, or limited mobility and include:

[Sexuality and Fertility After Cancer](#) by Leslie Schover, Ph.D. New York: John Riley and Sons, 1997. ISBN: 0-471-18194-3

[Enabling Romance: A Guide to Love, Sex, and Relationships for the Disabled \(and People Who Care about Them\)](#). by Ken Kroll and Erica Levy Klein. New York: Harmony books, 1992. ISBN:0-517-57532-9

[Sexual Function in People with Disability and Chronic Illness: A Health Professional's Guide](#) by Marca L. Sipski and Craig J. Alexander. Gaithersburg: Aspen Publication, 1997. ISBN:0-8342-0886-5

Fertility

Radiation to the head, surgery and most medication used in the treatment of brain tumors (excluding chemotherapy drugs) do not pose a threat to fertility. If radiation therapy is aimed at locations other than the head, you should consult your radiation oncologist about fertility concerns prior to beginning treatments. Often, a lead apron can provide adequate protection to sex organs during radiation treatments.

Chemotherapy can have a real and permanent effect on fertility in men, reducing or eliminating sperm production. While reversible in most cases, it may be a number of years before sperm counts return to normal.

In women, chemotherapies can temporarily halt menstrual periods, but normal menses should resume after treatments are concluded. Alkylating agents, however, can affect female egg production (effects worsen for older women), so concerns regarding fertility should be discussed prior to beginning treatment.

Personal concerns and the importance of fertility is an individual decision, and while not always the priority of the physician who is basing his/her treatment on life-saving measures, should be discussed before beginning any form of chemotherapy. If necessary, you should insist upon it.

Fertility experts can advise you about the possibility of sperm banking, in the case of a male patient, or the advancing options for women regarding egg harvesting and fertilization techniques. Sperm banks typically suggest a minimum sperm count to be frozen and used at a later date, but count alone (if low) should not discourage you. A fertility expert can best advise you regarding your chances of success in the case of a low sperm count and other options available to you.

Impotence, while rarely the result of brain tumor treatments, can occur as a result of depression. For those who experience more than the occasional (normal with aging) sexual dysfunction, consult your physician about medication and other available treatment avenues.

Fertility experts or physicians/therapists dealing with sexual problems near you can be located by visiting the [American Medical Association](#) or the [American Society for Reproductive Medicine](#). Additional resources are available from the [American Association of Sex Educators, Counselors, and Therapists](#).

Chapter 6: Insurance Management Know Thy Policy!

Understanding Your Insurance

Insurance laws vary from state to state. Additionally, your policy may be under state or federal guidelines depending on where you work, and if your employer is self-insured. Large employers who are self-insured are not considered an insurance company, but rather write their own policies that are in turn, managed by an oversight organization, which may be an HMO who operates within your state. They (the self-insured policies) are governed by federal laws and even states laws such as California – with strict HMO laws protecting consumers – are not available to those covered by self-insured, federally regulated plans.

Complicating things even further, plans such as HMO's and PPO's often fall under different jurisdictions as well. Your human resources department at your employer can often tell you if your plan is self-insured, governed by state or federal regulations, and the contact information for the proper agency.

Most insurance plans contain a specific list of “covered” medications and those that are excluded from coverage, called a “Formulary”, and by law, must provide you with a copy upon request. Many of the drugs used in the treatment of brain tumors are approved by the FDA for other conditions, but are not approved for treatment of conditions associated with brain tumors. When a physician prescribes a medication for a condition that falls outside the FDA approved guidelines, it's called an “off label” use, and in many cases, is not covered.

Many states provide an appeal process for challenging an “off label” denial that may assist you in obtaining coverage. You may be required (if for no other reason than your immediate need of the drug) to pay for the prescription out-of-pocket, as the process may take several weeks for a decision. If your employer or the insurance company will allow you to upgrade your prescription coverage to one that will allow for off-label medication coverage, you would be wise to do so now, regardless of whether or not you require such coverage at this time – it's likely you will need it in the future.

Note: Request a copy of your insurance plan's formulary and keep it in your treatment binder. Have your physician check the formulary when prescribing a new medication to ensure coverage, or perhaps select a like-drug (if available) from the formulary to avoid unnecessary out-of-the-pocket expense.

Information regarding the laws that govern switching plans during treatment or “continuity of care” issues when policies change with new employment, can best be answered by calling your state’s insurance commissioner office. Many states, such as

California, have specific departments for patient’s advocacy that can help you work through these issues, or direct you to the proper federal agency if your plan is governed by federal regulations. Such patient advocates within your state health insurance department can also help you file the necessary paperwork for appealing denials of coverage from your insurance company for specific treatments or medications, or to file complaints.

The following are some tips for dealing with insurance companies:

- All communications (from making claims to general inquiries) should be in writing.
- When communicating by phone or in person, be sure to record and confirm what your understanding of the conversation in a letter sent certified with a confirmation of receipt and copy of the letter in your file.
- Scrutinize everything you receive from the insurance company and hospital, *e.g.*, bills, payments and credits for mistakes – they DO happen! Do not be afraid to ask for explanations for items that are unclear or unspecified.
- Read your policy thoroughly so that you are aware of what benefits you are entitled to and what items are excluded, paying special attention to areas involving clinical trials or experimental treatments. Be prepared to ask your physician to write a letter on your behalf explaining why you should be allowed coverage for these items. It is helpful to have an “understanding” with your physician as to when consideration of experimental therapies would take place, rather than waiting for that day to arrive, only to find an unsupportive care partner.
- Do not hesitate to ask to deal with a "superior" of the person handling your account and keep accurate information regarding the names of all persons (and their position) involved with your claims.
- Before making a request make sure that the person you are dealing with has the authority to grant it.
- Do not be intimidated.
- Do not hesitate to challenge anything that doesn't sound right to you.
- If you are unsure about anything, check with the State Insurance Department (see above) and then, if necessary, with a lawyer. If you do not think you can afford a lawyer, you may be able to get low cost or free legal help. Try calling the local bar association to ask about legal aid (available through non-profit organizations in most major communities) or a local law school to ask if they have a student law clinic.
- Most states have non-profit advocacy organizations dedicated to access and continuity of care issues, able to discuss your legal rights and avenues for contesting insurance decisions on your behalf. You can search the Internet using the words: insurance denials, HMO, continuity of care, or healthcare access along

with “+ patient advocates”. In California, [Citizens for the Right to Know](#) is an excellent resource.

- Set up and keep a file of all correspondence and phone communications relating to your claims. This includes, but is not limited to, bills, payments, claims, letters you send, letters you receive, checks, contacts, and your policy.
- Be sure that all of your premiums are paid on time. You may have trouble getting insurance again if you let your policy lapse.

Appendix I: Virtualtrials.com website features

Virtualtrials.com is the website of the Musella Foundation For Brain Tumor Research & Information, Inc. It is also known by the title: “Clinical Trials and Noteworthy Treatments for Brain Tumors”. Take time to look through the menus – most people don’t realize how large the website is and the breadth of information it contains!

The website is organized into the home page and 6 main menu choices:

- **Home:**
Information about our website and organization.
- **Learn About:**
 - **Guide For The Newly Diagnosed** – This document!
 - **Brain Tumor Symptoms:** A list of symptoms, as well as a detailed paper about symptoms, and a survey (and results) of our member’s symptoms.
 - **Noteworthy Treatments:** An extensive list of articles on our website that is important to brain tumor patients and their families. Everyone should read the first article, Treatment Options for Glioblastoma and other Gliomas. It is 50+ pages long, written by a 10+year GBM survivor.
 - **Brain Tumor News:** Listing of news articles about brain tumors, conferences, and events. Note – the articles from our brain tumor news blast are archived here.
 - **Fundraising For Research:** A list of fundraisers that we are running as well as fundraisers that our members are running for us. All proceeds go to fund brain tumor research!
 - **Frequently Asked Questions:** a list of almost 1000 of the most frequently asked questions and answers. All answers are provided by brain tumor specialists, mostly by Dr. Paul Zeltzer – a world famous neuro-oncologist! You can ask questions here – and if it is general and may be of interest to others, we will post the responses here.
 - **Dictionary:** Look up brain tumor related terms here!
 - **Survivor Stories:** a sampling of stories about people dealing with many different types of tumors. It helps to see other people are managing, even with the worst types of brain tumors.
 - **Temodar:** an entire sub-section of the website devoted to everything about Temodar. (The most used chemotherapy for brain tumors). There is a review of the literature supporting its use, as well as the package insert and a dosage calculator that can give you a reality check to make sure your dose is in the right ball park – to catch math errors.
 - **Gliadel:** Information about these chemotherapy wafers that are implanted in the brain during a surgery. Look at the long-term results. You can also find a doctor experienced in the use of Gliadel, and see a video about Gliadel.

- **Find A Treatment:** Has many ways of locating treatments. Note that the order of the trials listing is determined by how recently the listings were verified, so the ones near the top are current. If you see an old “Last Updated” date – the trial may be closed. If you find a closed trial – let us know so that we can remove it!
 - **New Trials Listings:** Displays the most recently added or updated trials.
 - **Keyword Search:** If you know the name of the treatment you are looking for, this is how to find it!
 - **Advanced Search:** Allows you to specify the tumor type, geographical area, prior history and other factors to narrow down the choices to only the trials you may be eligible for.
 - **Treatments List:** Displays a list of the commonly used and experimental treatments being used for brain tumors.
 - **By Tumor Type:** Browse trials that allow your selected tumor type
 - **By Geographic Area:** Browse trials by country, state.
 - **Surgery:** Browse trials that involve Surgery
 - **Radiation:** Browse trials that involve Radiation
 - **Immunotherapy** Browse trials that involve Immunotherapies
 - **Gene Therapy** Browse trials that involve gene therapies
 - **Chemotherapy** Browse trials that involve chemotherapy
 - **Less Toxics** Browse trials that involve drugs with fewer side effects than the standard treatments.
 - **Trials Matcher** – we partnered with EmergingMed.com to provide a different database of clinical trials, with an easy way to search. No database is complete, but by using our database, the EmergingMed.com database and the ClinicalTrials.gov website, almost every brain tumor trial is covered!

- **Virtual Trial:** The brain tumor virtual trial is a study the Musella Foundation is doing where we observe, record and analyze what treatments are members are doing and the outcome. We do not tell you what to do – we just observe. Everyone should join. Participants can view the ongoing results.
 - **What is it:** An overview of the project
 - **Join:** Sign up for the project.
 - **Post an Update:** The project requires that you return once a month to post an update. It is important to post an update even if there is no change! We send you an email reminder to post the updates.

- **Interact**
 - **Live Chat:** Chat rooms where you can talk to others about brain tumors – and where we hold occasional live chats with brain tumor experts.
 - **Newsletter:** We have 2 email newsletters: The Brain Tumor News Blast, which contains news stories about brain tumors (sent out about two to four times a week); and the Musella Foundation newsletter, which contains

news about the Musella Foundation and our website, (sent out about once a month). You can sign up for either one or both – I recommend getting both. You can join, change your email address and unsubscribe from this area.

- **Feedback:** you can use the feedback form to make suggestions or ask questions about the website or our organization. We are very responsive to the requests received.
- **Video Library:** An extensive library of over 40 hours of presentations on every aspect of brain tumors. All available FREE and immediately with no registration required.
- **Unsubscribe:** an easy way to remove yourself from our newsletters. Note: you have to remove yourself from each online support group separately. Every message from the online support groups has removal instructions at the bottom.

- **Resources:**

- **Brain Tumor Centers:** A list of the major brain tumor centers. Some of which (the ones marked with a red asterisk) offer a free scan review.
- **Doctor / Hospital Address Book:** Look up the contact information for most of the brain tumor specialists.
- **Online Support Groups:** these groups work via email. When you send a message to the group email address, a copy is sent to all of the other members, who can then respond. You get a copy of everyone else's messages to the group.
- **Links:** A vast database of links to most of the important brain tumor resources on the Internet, browseable by many categories or searchable by keyword.
- **Books:** Listing of books on brain tumors.
- **Brain Tumor Organizations:** Visit their websites to get a balanced view. Everyone has their own views on the issues facing us and you need to get as many points of views as possible and educate yourself in order to make the best decisions.
- **Support Groups:** Listing of “real world” support groups, and each group has a place to post announcements. Try attending a meeting near you. Most of us would never consider joining a “support group”, but when it comes to something as serious as a brain tumor, support groups can be marvelous. You will meet other people going through the same thing as you, and most groups get exciting guest speakers to talk about brain tumors.
- **Memorials:** honoring our lost members.
- **Prayer List:** A place to request prayers for those who believe prayer can help.
- **Set Preferences:** If the menus on the website don't work or the text is too small, you can fix it here.

- **About Us:**
 - ***Musella Foundation:*** How we got started and what we do!
 - ***Research Grants:*** *A database of requests for brain tumor research grants. Any organization (or individuals) can fund listed projects – just let us know you do. OR – you can help us raise money for these projects. Also lists recent projects that we funded.*
 - ***Recent Additions to the Website:*** the most recent changes to the website. You can get the changes and brain tumor news stories delivered to your desktop via an RSS feed. Check the page for details!
 - ***Our Sponsors:*** These companies provide the resources to enable us to create and maintain the website.
 - ***Make a Donation:*** You can make a donation using paypal, credit card or check. Donations are used to fund brain tumor research.

There are many more features – these are just the highlights!

Take a moment to explore the site:

<http://www.virtualtrials.com>

Appendix II: The Future

I know things look dismal now. We have come a long way over the last few years – doubling average survival with the introduction of using Temodar and radiation concurrently. But that isn't good enough.

There has been an unprecedented burst of progress in identifying new approaches to the battle. There are new theories on the role of stem cells, new molecular signaling targets, new forms of radiation, new vaccines, anti-angiogenesis, tumor treating fields, gene therapies, advances in surgery and much more.

We are in the home stretch. The cure is almost within sight. It is now a matter of time and money. Although the government is now funding brain tumor research at the highest level ever, it isn't enough. Many promising projects go unfunded. Eventually the cure will be found, but for the first time in history – WE have a chance to speed up the process.

The Musella Foundation specializes in funding innovative and creative research, with a special emphasis on research that complements, rather than duplicates, the research funded by the federal government. We have funded the development of three new forms of immunotherapy, two of which went on to receive major funding from other sources. One is now in human trials; the other two will soon start. We have given over \$850,000 to 15 brain tumor research projects, and we have over \$2 million worth of worthy proposals sitting on our desk just waiting for funding.

We need your help to raise money.

Visit

<http://www.virtualtrials.com/fundraising.cfm>

for details on how you can help us speed up the search for the cure!

Appendix III: Resources

Brain Tumor Websites:

Name:	Phone:	Web address:
American Brain Tumor Association (ABTA)	800-886-2282	http://www.abta.org
National Brain Tumor Society (NBTS)	800-770-8287	http://www.braintumor.org
National Cancer Institute	1-800-422-6237	http://www.cancer.gov/
Pediatric Brain Tumor Foundation	800-253-6530	www.pbtfus.org
The Children's Brain Tumor Foundation	866-228-4673	http://cbtf.org/cms/
The Musella Foundation for Brain Tumor Research & Information	888-295-4740	http://www.virtualtrials.com http://www.virtualtrials.com/braintumororganizations.cfm
Tug McGraw Foundation	707- 255-1884	www.tugmcgraw.org
<u>Voices Against Brain Cancer</u>	212-340-9446	http://www.voicesagainstbraincancer.org/

Support Groups, Publications & Radio Talk Shows:

Name:	Descriptions:	Web address:
American Brain Tumor Association	For patient & Caregivers	http://www.abta.org/index.cfm?contentid=48
Brain Tumor Talk Radio	Information on brain tumor diagnosis, treatment options, & other critical information needed to make an informed decision.	http://blogtalkradio.com/BrainTumorTalk <i>Sponsored by Miles for Hope- Moving Towards A Cure!</i>
Cancer Care	Online & face-to-face support groups.	http://www.cancercare.org
Hope with Support	Helping others by providing encouragement & information.	http://www.hopewithsupport.org/
National Brain Tumor Society	Search by zip code to find a support group near you. Patient & caregiver peer support group.	http://www.braintumor.org/FindSupportGroup/ http://www.braintumor.org/PatientCaregiverSupportNetwork/
National Cancer Institute	Articles for almost every aspect of cancer information.	http://cancer.gov/cancerinfo/support

Clinical Trials:

Name: Web address:

American Brain Tumor Association	http://www.abta.org/Research_Progress/Find_Clinical_Trials/46
National Cancer Institute	http://www.cancer.gov/clinicaltrials
The Musella Foundation for Brain Tumor Research & Information	http://www.virtualtrials.com

Listservs & Chat Rooms:

Name: Web address:

National Brain Tumor Society	http://www.brainumor.org/Login/
Virtual Trials Chat Room	<p>http://www.virtualtrials.com/chat1.cfm</p> <p>For a complete listing or to join any of these groups, go to http://virtualtrials.com/lists.cfm</p>
Brain-Temozolomide Group	Originally was for patients / caregivers / doctors interested in the drug Temozolomide (Temodar) for brain tumors. Now we have expanded it to include <i>all medical treatments for all types of brain tumors</i> : malignant, benign, primary and metastatic. No talk of politics, jokes, and religion allowed. For those, use the other groups listed below!
Brain Tumor Community Group:	A NON-Medical discussion - for patients / caregivers / doctors interested in brain tumors! THIS IS AN ADULTS ONLY GROUP. Some humor and discussions will be offensive! Use this group for the types of messages that are off-topic on the other groups! Humor and politics are welcome here!
Spinal GBM group:	For people interested in a spinal GBMs.
Brain - Gleevec group:	For people interested in the experimental drug Gleevec for brain tumors.
Brain Tumor Virtual Trial Group:	For people who are participating in our brain tumor virtual trial.
Bt-Faith Group:	For discussions involving faith / religion / God among people interested in brain tumors.
Optic Glioma Group:	Discussions involving optic gliomas.

Brainstem Glioma Group:	For adults and children with brainstem tumors.
Choroid Plexus Papilloma Group:	For adults and children with Choroid Plexus Papillomas.
Acoustic Neuroma Group:	Discussions involving Acoustic Neuomas.
Online support groups run by other organizations:	
Brain Surgery Group:	A support website/ mailing lists for brain tumor patients, has been in operation since February 2000. Their purpose is to educate patients, families and medical professionals and to improve the quality of medical care/ follow-up and increase knowledge and awareness.
Pediatric Brain Tumors:	This list is for the discussion of all pediatric brain tumors, primarily by parents and immediate family. However, all medical professionals both involved in the diagnosis and treatment are welcome. We deal with the tough stuff head on. We laugh, we cry, we argue and vent together as we search for answers. For the protection of members, short bio (a little bit about you and your interest in the group) will be requested after submitting your membership request and before we provide full access.
Bt-finance Group:	For discussions involving financial matters among people interested in brain tumors, including insurance issues, disability issues, prescription assistance plans.
Brain - Activist Group:	An e-mail discussion of legal, regulatory and public policy issues impacting cancer patient rights and benefits in clinical trials, especially brain cancer patients. Purpose of educating and empowering the patient community and especially the brain cancer patient community.
Adult ependymoma mailing list:	An on-line support group for adult ependymoma patients, caregivers and relatives.
Teens of Parent Survivors:	A support group started to allow teenagers who have parents with a brain tumor to discuss issues, concerns, and just talk about everyday life while having a parent who is ill. Please email OoLewicoO@aol.com if you would like to join.
Australian Brain Tumour Discussion Group	OzBrainTumour is a community of support for Australians dealing with brain tumours. Ask questions; discuss treatment options and coping strategies.
Pacific Northwest Brain Tumor List:	For brain tumor patients / caregivers in the United States Pacific Northwest.
Chordoma Support Group:	An online support group for people affected by clival, spinal or sacral chordoma.
Educating Brain Tumor Kids:	An educational resource center for teachers, schools, parents, and social workers to educate children with brain tumors.
Cerebellar Mutism and Posterior Fossa Syndrome:	A support group of parents and friends of children with brain tumors who suffered from cerebellar mutism and posterior fossa syndrome after brain tumor removal. Approved members can access a 52 web based resource guide.
BT Canada Group:	Supports the treatment of brain tumors in Canada.

Pituitary Tumor Listserv	Designed for patients and caregivers who have, or have had Pituitary Tumors and Disorders. There is no age limit to join, it's for us all Pituitary Patients and Care Givers
Hopkins Meningioma Mailing List	For anyone interested in meningiomas, either as patients, caregivers, friends or doctors.
Meningioma Support Group	Associated with the " Meningioma Support and Information " web site to research more information on meningiomas. You can share your stories, hopes, questions, triumphs, and frustrations about meningioma brain tumors. This site is here to help ease the effects of isolation, and to help people get on with their life after diagnosis.
Meningioma Talk	Post questions and answers; problems and solutions; successes and failures; hopes and support about Meningioma brain tumors.
Medulloblastoma Group	A resource center with easy to read information about medulloblastoma. Share your stories and have access to information about medulloblastoma.
Bereavement:	The Bereavement Support Group is an online community to provide support to family members and friends whom have lost a loved one due to a brain tumor.
Hypothalamic Hamartoma Information and Support Share Group	A worldwide group comprised of families with a child or adult that has been afflicted with a HH. Find information about HH, references to medical articles, and the latest treatment developments. Share your stories and experiences by joining the discussion group.
Supreme Crossings:	This mailing list is open to any individual needing support or wishing to provide support in the areas of Brain Tumor end of life, before, during and after as well as sharing and providing home health care support issues.
Bthealthykids:	This is a list created by brain tumor patients and caregivers of brain tumor patients who, in addition to the many demands that come from dealing with a brain tumor in the family, are also contending with the day-to-day joys and sorrows of raising children. There are many extra concerns and stresses with respect to parenting issues, whether they have to do with the children's questions about the brain tumor or a simple bee sting.
Btcaregivers:	This is the only forum where brain tumor caregivers can praise and rail, laugh and fume, feel their whole fear and release their stress without the worry of hurting the loved one for whom they offer care. Just as there are things that patients can only discuss with each other, there are things that caregivers can only truly express to other caregivers.

Financial, Prescription & Travel/Flight Assistance Resources

Name:	Web address:
American Brain Tumor Association	http://www.abta.org/Care_&_Support/Financial_Assistance_Resources/49
Angel Flight Travel Assistance Available	http://www.angelflight.com
Cancer Care	www.cancercare.org
Medicare Rights Center	www.medicarerights.org
Medicare Prescription Drug Program	www.medicare.gov
Miles for Hope Travel Assistance Available	http://www.milesforhope.org
Mission for Maureen Travel Assistance Available	http://www.mission4maureen.com
National Brain Tumor Society	www.brainumor.org
Patient Advocate Foundation	www.copays.org
Supplemental (SSI) & Social Security Disability Insurance	www.socialsecurity.gov

Acknowledgement

*This patient guide was written by members of the
Grey Ribbon CrusadeTM*

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(United Forces Against Brain Cancer) group
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**The information presented in this document is the opinion of the above people,
whom are not MDs. Take the information as ideas to explore further with your
doctors – not as medical advice.**

Members

AITC - Associazione Italiana Tumori Cerebrali ONLUS
Another Day Another Memory (A.D.A.M.)
Benny's World
Brain Injury Association of Wyoming
Brain Tumor Action Network
Brain Tumor Resource And Information Network
Brown Bag For A Cure
C.E.V.A.N. Louie Foundation for Brain Cancer
Childhood Brain Tumor Foundation
Cure Starts Now
Dr. Marnie Rose Foundation
Florida Brain Tumor Association
Gunner's Magic Train Pediatric Cancer Foundation
Have A Chance Inc.
HOPE With Support, Inc.
I Could Be Your Child
Imerman Angels
Just One More Day for Love, Hope & a Cure
Kevin Mullin Memorial Fund for Brain Tumor Research
Kyle Daniel Kerpan Foundation
LAAF - Lori Arquilla Andersen Foundation
Lauren's First and Goal Foundation
Lifestream for Kids
Lou Beeler Foundation
Miles For Hope
Mission4Maureen
Monmouth and Ocean County Brain Tumor Support Group
Musella Foundation For Brain Tumor Research & Information, Inc
National Brain Tumor Society
Ohio State University Medical Center
Oklahoma Brain Tumor Foundation
Oligo Fund of Musella Foundation
Pediatric Low Grade Astrocytoma Foundation
Peter A Bednarski Fund for Brain Tumor Research Inc
Preston Robert Tisch Brain Tumor Center
Rachael's Ribbons of Hope Foundation
Samuel J Foundation
Smiles For Sophie Forever
Tali's Fund
The Brad Kaminsky Foundation for Brain Tumor Research
The Brain Tumor Awareness Organization
The Charles Warren Brain Tumor Awareness Foundation, Inc.
The Chris Elliott Fund
The Kortney Rose Foundation
The Nick Gonzales Foundation for Brain Tumor Research
Tommy Detesco Fund for Adolescents and Young Adults
UCLA Department of Neurosurgery
University of Pennsylvania Department of Neurosurgery
Unlocking Brain Tumors, Inc
Voices Against Brain Cancer
We Can, Pediatric Brain Tumor Network
Wylie's Day Foundation

Who:

The Heroes of Hope™ are those willing to be a part of a United Force Against Brain Tumors.

What:

The Heroes of Hope™ initiative seeks to create dynamic action in the drive for funding of brain tumor research through a synergistic approach.

Where:

Join our existing charitable organizations, our online community or let us help you bring the Grey Ribbon Crusade to your town.

When:

Now is the Time to Unite and Fight for a CURE!

Why:

Because within the next 12 months, over 200,000 people in the U.S.A. will be diagnosed with a primary or metastatic brain tumor.

How:

If you have your own, or are affiliated with a non-for-profit that currently raises awareness and funds brain tumor research, simply join us!

The Grey Ribbon Crusade!

<http://www.greyribboncrusade.org>