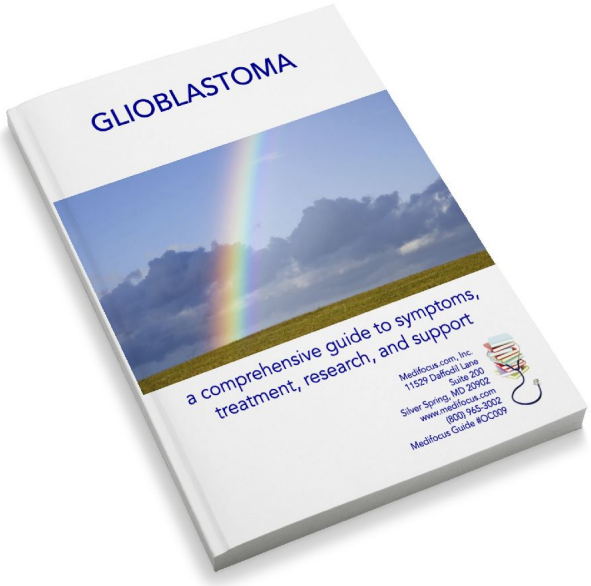
Preview of the Medifocus Guidebook on: Glioblastoma

Updated January 29, 2017



This document is only a SHORT PREVIEW of the **Medifocus Guidebook on Glioblastoma**. It is intended primarily to give you a general overview of the **format and structure** of the Guidebook as well as select pages from each major Guidebook section listed in the Table of Contents.

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1 - Background Information

Introduction

Chronic or life-threatening illnesses can have a devastating impact on both the patient and the family. In today's new world of medicine, many consumers have come to realize that they are the ones who are primarily responsible for their own health care as well as for the health care of their loved ones.

When facing a chronic or life-threatening illness, you need to become an educated consumer in order to make an informed health care decision. Essentially that means finding out everything about the illness - the treatment options, the doctors, and the hospitals - so that you can become an educated health care consumer and make the tough decisions. In the past, consumers would go to a library and read everything available about a particular illness or medical condition. In today's world, many turn to the Internet for their medical information needs.

The first sites visited are usually the well known health "portals" or disease organizations and support groups which contain a general overview of the condition for the layperson. That's a good start but soon all of the basic information is exhausted and the need for more advanced information still exists. What are the latest "cutting-edge" treatment options? What are the results of the most up-to-date clinical trials? Who are the most notable experts? Where are the top-ranked medical institutions and hospitals?

The best source for authoritative medical information in the United States is the National Library of Medicine's medical database called PubMed®, that indexes citations and abstracts (brief summaries) of over 7 million articles from more than 3,800 medical journals published worldwide. PubMed® was developed for medical professionals and is the primary source utilized by health care providers for keeping up with the latest advances in clinical medicine.

A typical PubMed® search for a specific disease or condition, however, usually retrieves hundreds or even thousands of "hits" of journal article citations. That's an avalanche of information that needs to be evaluated and transformed into truly useful knowledge. What are the most relevant journal articles? Which ones apply to your specific situation? Which articles are considered to be the most authoritative - the ones your physician would rely on in making clinical decisions? This is where *Medifocus.com* provides an effective solution.

Medifocus.com has developed an extensive library of *MediFocus Guidebooks* covering a wide spectrum of chronic and life threatening diseases. Each *MediFocus Guidebook* is a

high quality, up- to-date digest of "professional-level" medical information consisting of the most relevant citations and abstracts of journal articles published in authoritative, trustworthy medical journals. This information represents the latest advances known to modern medicine for the treatment and management of the condition, including published results from clinical trials. Each *Guidebook* also includes a valuable index of leading authors and medical institutions as well as a directory of disease organizations and support groups. *MediFocus Guidebooks* are reviewed, revised and updated every 4-months to ensure that you receive the latest and most up-to-date information about the specific condition.

About Your MediFocus Guidebook

Introduction

Your *MediFocus Guidebook* is a valuable resource that represents a comprehensive synthesis of the most up-to-date, advanced medical information published about the condition in well-respected, trustworthy medical journals. It is the same type of professional-level information used by physicians and other health-care professionals to keep abreast of the latest developments in biomedical research and clinical medicine. The *Guidebook* is intended for patients who have a need for more advanced, in-depth medical information than is generally available to consumers from a variety of other resources. The primary goal of a *MediFocus Guidebook* is to educate patients and their families about their treatment options so that they can make informed health-care decisions and become active participants in the medical decision making process.

The *Guidebook* production process involves a team of experienced medical research professionals with vast experience in researching the published medical literature. This team approach to the development and production of the *MediFocus Guidebooks* is designed to ensure the accuracy, completeness, and clinical relevance of the information. The *Guidebook* is intended to serve as a basis for a more meaningful discussion between patients and their health-care providers in a joint effort to seek the most appropriate course of treatment for the disease.

Guidebook Organization and Content

Section 1 - Background Information

This section provides detailed information about the organization and content of the *Guidebook* including tips and suggestions for conducting additional research about the condition.

Section 2 - The Intelligent Patient Overview

This section of your *MediFocus Guidebook* represents a detailed overview of the disease or condition specifically written from the patient's perspective. It is designed to satisfy the basic informational needs of consumers and their families who are confronted with the illness and are facing difficult choices. Important aspects which are addressed in "The Intelligent Patient" section include:

- The etiology or cause of the disease
- Signs and symptoms
- How the condition is diagnosed
- The current standard of care for the disease
- Treatment options

- New developments
- Important questions to ask your health care provider

Section 3 - Guide to the Medical Literature

This is a roadmap to important and up-to-date medical literature published about the condition from authoritative, trustworthy medical journals. This is the same information that is used by physicians and researchers to keep up with the latest developments and breakthroughs in clinical medicine and biomedical research. A broad spectrum of articles is included in each *MediFocus Guidebook* to provide information about standard treatments, treatment options, new clinical developments, and advances in research. To facilitate your review and analysis of this information, the articles are grouped by specific categories. A typical *MediFocus Guidebook* usually contains one or more of the following article groupings:

- *Review Articles:* Articles included in this category are broad in scope and are intended to provide the reader with a detailed overview of the condition including such important aspects as its cause, diagnosis, treatment, and new advances.

- *General Interest Articles:* These articles are broad in scope and contain supplementary information about the condition that may be of interest to select groups of patients.

- *Drug Therapy:* Articles that provide information about the effectiveness of specific drugs or other biological agents for the treatment of the condition.

- *Surgical Therapy:* Articles that provide information about specific surgical treatments for the condition.

- *Clinical Trials:* Articles in this category summarize studies which compare the safety and efficacy of a new, experimental treatment modality to currently available standard treatments for the condition. In many cases, clinical trials represent the latest advances in the field and may be considered as being on the "cutting edge" of medicine. Some of these experimental treatments may have already been incorporated into clinical practice.

The following information is provided for each of the articles referenced in this section of your *MediFocus Guidebook:*

- Article title
- Author Name(s)
- Institution where the study was done
- Journal reference (Volume, page numbers, year of publication)

- Link to Abstract (brief summary of the actual article)

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Section 4 - Centers of Research

We've compiled a unique directory of doctors, researchers, medical centers, and research institutions with specialized research interest, and in many cases, clinical expertise in the management of the specific medical condition. The "Centers of Research" directory is a valuable resource for quickly identifying and locating leading medical authorities and medical institutions within the United States and other countries that are considered to be at the forefront in clinical research and treatment of the condition.

Inclusion of the names of specific doctors, researchers, hospitals, medical centers, or research institutions in this *Guidebook* does not imply endorsement by Medifocus.com, Inc. or any of its affiliates. Consumers are encouraged to conduct additional research to identify health-care professionals, hospitals, and medical institutions with expertise in providing specific medical advice, guidance, and treatment for this condition.

Section 5 - Tips on Finding and Choosing a Doctor

One of the most important decisions confronting patients who have been diagnosed with a serious medical condition is finding and choosing a qualified physician who will deliver high-level, quality medical care in accordance with curently accepted guidelines and standards of care. Finding the "best" doctor to manage your condition, however, can be a frustrating and time-consuming experience unless you know what you are looking for and how to go about finding it. This section of your Guidebook offers important tips for how to find physicians as well as suggestions for how to make informed choices about choosing a doctor who is right for you.

Section 6 - Directory of Organizations

This section of your *Guidebook* is a directory of select disease organizations and support groups that are in the business of helping patients and their families by providing access to information, resources, and services. Many of these organizations can answer your questions, enable you to network with other patients, and help you find a doctor in your geographical area who specializes in managing your condition.

2 - The Intelligent Patient Overview

GLIOBLASTOMA

Introduction to Brain Tumors

Brain tumors belong to a group of diverse tumors that affect the brain and spinal cord known as *central nervous system neoplasms*. A brain tumor is a mass of abnormal cells in the brain that have grown and multiplied in an uncontrolled fashion. Brain tumors that develop from various types of cells that make up the brain are called *primary brain tumors*. These types of brain tumors are usually localized (confined) to the brain itself and only rarely spread to other parts of the body. *Metastatic brain tumors*, also know as *secondary brain tumors*, originate from cancer cells in another part of the body (e.g., lung, breast) and spread to the brain through the bloodstream. The distinction between primary and secondary brain tumors is important from a clinical perspective because they are usually treated differently.

Approximately 50% of all primary brain tumors originate from specialized nerve cells in the brain called *glial cells*. Brain tumors that arise from glial cells are called *gliomas*. There are many different types of gliomas but the most common gliomas develop from glial cells called *astrocytes*. Primary brain tumors that develop from astrocytes are referred to as *astrocytomas*.

The World Health Organization (WHO) classifies astrocytomas into four distinct grades designated as Grade I, II, III, and IV (discussed in detail below) on the basis of how quickly the cells grow and spread and how the cells appear under a microscope. A *glioblastoma*, technically know as *glioblastoma multiforme*, is the fastest growing type of astrocytoma (Grade IV astrocytoma) that quickly spreads and invades nearby normal brain tissue and contains areas of dead cells (necrosis) in the center of the tumor.

According to the American Cancer Society, an estimated 22,000 adults in the United States were diagnosed with primary malignant tumors of the brain and spinal cord in 2010. Approximately 13,140 people died from these tumors. Glioblastoma multiforme (GM) is the most common type of primary malignant brain tumor in adults and accounts for about 50% to 60% of cases. Although GM can occur in all age groups, it is most commonly observed in adults 50 to 70 years in age. Less than 10% of childhood brain tumors are glioblastomas. Glioblastoma multiforme tends to occur more frequently in males than females by a ratio of about 3:2.

Trends in Brain Cancer Incidence and Survival in the United States

In an article published in 2006 in *Neurosurgery Focus* (Vol. 20; Issue 4; pp. E1-E7), researchers reported on the trends in brain cancer incidence and survival in the United States from 1973 to

2001. The researchers reviewed 38,453 cases of malignant brain tumors that were reported to the Surveillance, Epidemiology, and End Results (SEER) Program Registry from 1973 to 2001. The major findings of this study can be summarized as follows:

- The overall incidence of malignant brain tumors was 6.1 cases per 100,000 person-years.
- The most common malignant tumor type was glioblastoma multiforme (GM) which accounted for 16,797 cases, corresponding to an incidence rate of 2.8 cases per person-years.
- The incidence of malignant brain tumors was found to increase significantly with age. The relative risk of developing a malignant brain tumor was about 3.2 times higher for elderly people than for young adults.
- The risk of developing a malignant brain tumor was about 1.5 times higher for men than for women of similar age.
- Residents of metropolitan counties were about 1.4 times more likely to develop a malignant brain tumor than those residing in non-metropolitan counties.
- In general, the 5-year relative survival rates for patients with all types of malignant brain tumors showed improvement from 1973 to 2001:
    - 1970's - 21%
    - 1980's - 27%
    - 1990's - 31%
- Unfortunately, no statistically significant improvement in survival rates were noted for patients with glioblastoma multiforme after the 1980's. The 1-year relative survival rate for patients with GM after the 1980's was 32% and has remained consistent since then reflecting the urgent need to develop more effective treatments for this lethal type of brain cancer.

Risk Factors for Primary Brain Tumors

A risk factor is anything that increases a person's chances of getting a particular disease, such as cancer. Despite extensive past and current research to identify major risk factors, it appears that most primary brain tumors develop for no apparent know reason. Radiation therapy to the head for the treatment of other types of cancers is currently the only established risk factor for developing a primary brain tumor. For example, children with leukemia who receive radiation therapy to the brain as part of their treatment are at risk for developing a brain tumor later in life.

The link between exposure to certain chemicals (e.g., vinyl chloride), petroleum products, and chemicals used in the production of synthetic rubber has been suspected, but not proven, as a risk factor for brain tumors. More recently, the expansion of wireless cellular telephones has raised the concern about a possible link between radiofrequency exposure from cellular phones and the development of brain tumors. To date, no studies have found an association between the use of

cellular phones and brain tumors, however, research in this area is ongoing. Exposure to electromagnetic fields from high-tension wires has also been suspected as a risk factor for brain tumors, however, most studies have concluded that there is no strong evidence that clearly proves an association.

Causes of Primary Brain Tumors

Over the years, researchers have learned a great deal about the underlying molecular and genetic events that are involved in the transformation of a "normal" cell to a "malignant" or cancerous cell. Brain tumors, like other types of cancers, are thought to be caused by *genetic mutations* (abnormalities). Some genetic mutations are passed down from parents to children (*inherited mutations*) while other genetic mutations, known as *acquired mutations*, develop as a result of risk factors, such as smoking or chemical exposure, that causes damage to the genetic material (DNA) of the cells during the normal cell division cycle.

Most people who develop a primary brain tumor do not have a family history of brain tumors so that inherited mutations do not appear to play a major role in the development of brain tumors. With the exception of exposure to ionizing radiation during radiation therapy to the head for the treatment of other types of cancers, there is no clear-cut association between exposure to other environmental risk factors and the development of brain tumors. As mentioned previously, it appears that most primary brain tumors develop for no apparent know reason. Although the exact cause remains elusive, researchers are continuing to investigate the role of environmental factors, genetic factors, and certain types of viruses in the development of primary brain tumors.

Classification of Astrocytomas

In most cases, brain tumors are named for the specific cell types from which they originate. The general term used for tumors that originate from the glial cells that support and nourish the brain is *gliomas*. There are several different types of glial cells that can be differentiated by their appearance under a microscope including *oligodendrocytes*, *ependymal cells*, and *astrocytes*. The most common primary brain tumors are *astrocytomas* that originate from star-shaped glial cells called *astrocytes*.

The World Health Organization (WHO) classification system divides astrocytomas into the following four types or Grades:

- Grade I = Pilocytic Astrocytoma - This is a slow-growing astrocytoma that usually does not spread to other parts of the central nervous system. This is the least malignant of the four Grades of astrocytomas.

- Grade II = Low-Grade Astrocytoma - This is also a relatively slow-growing type of astrocytoma but grows faster than a pilocytic astrocytoma (Grade I). It may or may not invade the surrounding normal brain tissue. It tends to recur after treatment.

- Grade III = Anaplastic Astrocytoma - This is a malignant astrocytoma that grows faster than a low-grade astrocytoma (Grade II). It has a tendency to invade normal brain tissue and to

also recur after treatment. Grade III astrocytomas are rare and account for less than 5% of all brain tumors.

- Grade IV = Glioblastoma Multiforme - This is the most malignant and fastest growing type of all of the astrocytomas. Under a microscope, several different cell types can be observed in the tumor including astrocytes and oligodendrocytes. Areas of necrosis (dead cells) can also be observed at the center of the tumor. Glioblastoma multiforme tends to grow and spread rapidly and quickly invades normal brain tissue. Glioblastoma multiforme accounts for about 25% of all primary brain tumors and occurs most commonly in adults 50 to 70 years of age.

The **Intelligent Patient Overview** in the complete **Medifocus Guidebook on Glioblastoma** also includes the following additional sections:

- **Diagnosis of Brain Tumors**
- **Treatment Options for Glioblastoma Multiforme**
- **The Role of Complementary and Alternative Therapies in Cancer**
- **Quality of Life Issues in Cancer**
- **New Developments in Glioblastoma Multiforme**
- **Questions to Ask Your Health Care Provider**

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3 - Guide to the Medical Literature

Introduction

This section of your *MediFocus Guidebook* is a comprehensive bibliography of important recent medical literature published about the condition from authoritative, trustworthy medical journals. This is the same information that is used by physicians and researchers to keep up with the latest advances in clinical medicine and biomedical research. A broad spectrum of articles is included in each *MediFocus Guidebook* to provide information about standard treatments, treatment options, new developments, and advances in research.

To facilitate your review and analysis of this information, the articles in this *MediFocus Guidebook* are grouped in the following categories:

- Review Articles - 62 Articles
- General Interest Articles - 25 Articles
- Drug Therapy Articles - 19 Articles
- Surgical Therapy Articles - 16 Articles
- Clinical Trials Articles - 55 Articles
- Radiation Therapy Articles - 17 Articles

The following information is provided for each of the articles referenced in this section of your *MediFocus Guidebook:*

- Title of the article
- Name of the authors
- Institution where the study was done
- Journal reference (Volume, page numbers, year of publication)
- Link to Abstract (brief summary of the actual article)

Linking to Abstracts: Most of the medical journal articles referenced in this section of your *MediFocus Guidebook* include an abstract (brief summary of the actual article) that can be accessed online via the National Library of Medicine's PubMed® database. You can easily access the individual abstracts online via PubMed® from the "electronic" format of your *MediFocus Guidebook* by clicking on the URI that is provided for each cited article. If you purchased a printed copy of the *MediFocus Guidebook*, you can still access the abstracts online by entering the individual URI for a particular abstract into your computer's web browser.

Recent Literature: What Your Doctor Reads

Database: PubMed <January 2012 to January 2017>

Review Articles

1.

Intraventricular Glioblastomas.

Authors: Ben Nsir A; Gdoura Y; Thai QA; Zhani Kassar A; Hattab N; Jemel H
Institution: Department of Neurosurgery, Fattouma Bourguiba University Hospital-University of Medicine of Monastir, Monastir, Tunisia. Electronic address: atefbn@hotmail.fr. of Medicine of Tunis, University of Tunis El Manar, Tunis, Tunisia. University School of Medicine, Baltimore, Maryland, USA. Tunis, University of Tunis El Manar, Tunis, Tunisia. Medicine of Monastir, Monastir, Tunisia. of Medicine of Tunis, University of Tunis El Manar, Tunis, Tunisia.
Journal: World Neurosurg. 2016 Apr;88:126-31. doi: 10.1016/j.wneu.2015.12.079. Epub 2016 Jan 8.
Abstract Link: http://www.medifocus.com/abstracts.php?gid=OC009&ID=26773981

2.

Role of mTOR in glioblastoma.

Authors: Duzgun Z; Eroglu Z; Biray Avci C
Institution: Department of Medical Biology, Faculty of Medicine, Ege University, Bornova, Izmir, Turkey. Izmir, Turkey. Izmir, Turkey.
Journal: Gene. 2016 Jan 10;575(2 Pt 1):187-90. doi: 10.1016/j.gene.2015.08.060. Epub 2015 Sep 1.
Abstract Link: http://www.medifocus.com/abstracts.php?gid=OC009&ID=26341051

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- Radiation Therapy Articles - 17 Articles

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4 - Centers of Research

This section of your *MediFocus Guidebook* is a unique directory of doctors, researchers, medical centers, and research institutions with specialized research interest, and in many cases, clinical expertise in the management of this specific medical condition. The *Centers of Research* directory is a valuable resource for quickly identifying and locating leading medical authorities and medical institutions within the United States and other countries that are considered to be at the forefront in clinical research and treatment of this disorder.

Use the *Centers of Research* directory to contact, consult, or network with leading experts in the field and to locate a hospital or medical center that can help you.

The following information is provided in the *Centers of Research* directory:

- **Geographic Location**
  - United States: the information is divided by individual states listed in alphabetical order. Not all states may be included.
  - Other Countries: information is presented for select countries worldwide listed in alphabetical order. Not all countries may be included.
- **Names of Authors**
  - Select names of individual authors (doctors, researchers, or other health-care professionals) with specialized research interest, and in many cases, clinical expertise in the management of this specific medical condition, who have recently published articles in leading medical journals about the condition.
  - E-mail addresses for individual authors, if listed on their specific publications, is also provided.
- **Institutional Affiliations**
  - Next to each individual author's name is their **institutional affiliation** (hospital, medical center, or research institution) where the study was conducted as listed in their publication(s).
  - In many cases, information about the specific **department** within the medical institution where the individual author was located at the time the study was conducted is also provided.

Centers of Research

United States

AL - Alabama

Name of Author	Institutional Affiliation
Friedman GK	Departments of Pediatrics, Division of Hematology and Oncology, University of Alabama at Birmingham, Birmingham, AL 35233, USA.
Grossman SA	Brain Tumor Treatment and Research Program, University of Alabama at Birmingham, Birmingham, Alabama, USA. jfisher@jhmi.edu
Nabors LB	Brain Tumor Treatment and Research Program, University of Alabama at Birmingham, Birmingham, Alabama, USA. jfisher@jhmi.edu
Reddy AT	Departments of Pediatrics, Division of Hematology and Oncology, University of Alabama at Birmingham, Birmingham, AL 35233, USA.

CA - California

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Bloch O	Department of Neurological Surgery, University of California, San Francisco, California 94143-0112, USA.
Clark AJ	Department of Neurological Surgery, University of California, San Francisco, San Francisco, California 94143-0112, USA.
Cloughesy TF	Department of Neurology and Neuro-Oncology Program, University of California, Los Angeles, California 90095; email: pmischel@ucsd.edu.

The **Centers of Research** in the complete **Medifocus Guidebook on Glioblastoma** includes the following sections:

- Centers of Research for relevant states in the United States
- Centers of Research listed for relevant countries outside the United States

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5 - Tips on Finding and Choosing a Doctor

Introduction

One of the most important decisions confronting patients who have been diagnosed with a serious medical condition is finding and choosing a qualified physician who will deliver a high level and quality of medical care in accordance with currently accepted guidelines and standards of care. Finding the "best" doctor to manage your condition, however, can be a frustrating and time-consuming experience unless you know what you are looking for and how to go about finding it.

The process of finding and choosing a physician to manage your specific illness or condition is, in some respects, analogous to the process of making a decision about whether or not to invest in a particular stock or mutual fund. After all, you wouldn't invest your hard eared money in a stock or mutual fund without first doing exhaustive research about the stock or fund's past performance, current financial status, and projected future earnings. More than likely you would spend a considerable amount of time and energy doing your own research and consulting with your stock broker before making an informed decision about investing. The same general principle applies to the process of finding and choosing a physician. Although the process requires a considerable investment in terms of both time and energy, the potential payoff can be well worth it--after all, what can be more important than your health and well-being?

This section of your Guidebook offers important tips for how to find physicians as well as suggestions for how to make informed choices about choosing a doctor who is right for you.

Tips for Finding Physicians

Finding a highly qualified, competent, and compassionate physician to manage your specific illness or condition takes a lot of hard work and energy but is an investment that is well-worth the effort. It is important to keep in mind that you are not looking for just any general physician but rather for a physician who has expertise in the treatment and management of your specific illness or condition. Here are some suggestions for where you can turn to identify and locate physicians who specialize in managing your disorder:

- **Your Doctor -** Your family physician (family medicine or internal medicine specialist) is a good starting point for finding a physician who specializes in your illness. Chances are that your doctor already knows several specialists in your geographic area who specialize in your illness and can recommend several names to you. Your doctor can also provide you with information about their qualifications, training, and hospital affiliations.

The **Tips on Finding and Choosing a Doctor** in the complete **Medifocus Guidebook on Glioblastoma** includes additional information that will assist you in locating a highly qualified and competent physician to manage your specific illness.

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6 - Directory of Organizations

American Brain Tumor Association
8550 W. Bryn Mawr Road Suite 550 Chicago, IL 60631
800.886.2282; 773.577.8750
abtacares@abta.org
www.abta.org

American Cancer Society
1599 Clifton Road, N.E.; Atlanta, GA 30329
800.227.2345; 404.486.0100
www.cancer.org

American Institute for Cancer Research; Nutrition Hotline
1759 R St. NW; Washington, DC 20009
800.843.8114; 202.328.7744
aicrweb@aicr.org
www.aicr.org

Association of Cancer Online Resources
www.acor.org

Brain Tumour Foundation of Canada
620 Colborne Street; Suite 301; London, Ontario; N6B 3R9 CANADA
800.265.5106; 519.642.7755
btfc@btfc.org
www.braintumour.ca

Cancer Care
275 Seventh Avenue; New York, NY 10001
800.813.4673; 212.712.8400
info@cancercare.org
www.cancercare.org

The **Directory of Organizations** in the complete **Medifocus Guidebook on Glioblastoma** includes a list of selected disease organizations and support groups that are helping people diagnosed with Glioblastoma.

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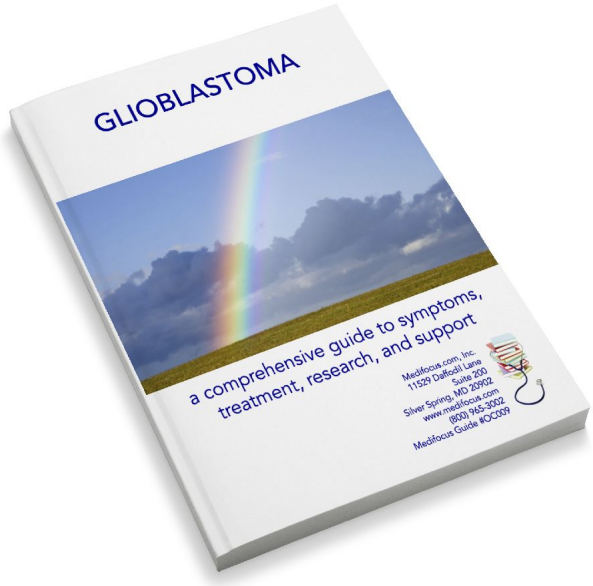

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