Brain<br>Plus Acoustic Neuroma<br>Radiosurgery<br><br>The Experienced Radiosurgery Team
Our experts who pioneered fractionated stereotactic radiosurgery in the Western Hemisphere have tremendous experience treating many kinds of primary and metastatic cancers as well as benign tumors like acoustic neuromas, meningiomas and pituitary tumors. The experience is unparalleled.

Yet for each patient, his or her circumstance is unique. Each patient has a particular kind of tumor and a particular history when coming to Radiosurgery New York. Each patient has a specific site or sites of disease. Prior treatment, sensitivities to agents and procedures are significant factors that must be taken into account.

Therefore, while this booklet talks about the beauty of stereotactic radiosurgery - it is not for everyone. If you have an interest in stereotactic brain radiosurgery - even if you have had prior chemotherapy, surgery or radiation - you should discuss your case individually with the doctors at Radiosurgery New York.

The doctors at Radiosurgery New York have the experience and knowledge in the field to help guide the patient. Of course, each person deciding on treatment goes through an intensive Informed Consent Process that describes the risks, benefits and alternatives of therapy. Only after this procedure does the patient make their final, informed decision.

The attractiveness of stereotactic radiosurgery is the precision with which it is delivered, the ability to escalate the dose of radiation and to minimize the volume of healthy tissue that receives the prescribed dose of radiation.
WHAT DOES IT MEAN TO CONTROL A TUMOR?

In the field of fractionated stereotactic radiosurgery, controlling a tumor means that the growth outlined and targeted for treatment stops growing, shrinks or disappears. This definition should not be unclear. Since stereotactic radiosurgery is so different from standard radiation, chemotherapy or surgery, a separate definition has been developed over the years. This definition means that the area - or tumor - that has been targeted will possibly cease to grow and that further treatment to that area will be unnecessary. The likelihood of local control is very high with stereotactic radiosurgery. This number usually ranges from 80 to 90%, depending on the type of disease, volume and location. This high level of control usually remains for the rest of the patient’s life in the targeted field. Of course, 80 or 90% is not 100% and failure can occur. Nothing is guaranteed in life - this we all know.

That is why we ask for follow-up scans on a regular basis. These scans can be performed sooner depending on the patient’s needs and symptoms.

Stereotactic radiosurgery is not for every patient. We decline to treat one-half of the potential patients who apply. We believe, however, that for selected patients, there is great appeal. We have the ability to offer, when appropriate, more intense treatment locally, smaller fields of radiation (so healthy tissues receive lesser amounts of radiation), higher doses per fraction (means, in general, less treatments) with higher control rates.

While we understand other hospitals and physicians are interested in this project and will approach it in the future, we at Radiosurgery New York have been involved with stereotactic radiosurgery for over a decade-and-a-half and have a variety of firsts including first extracranial non-invasive fractionated stereotactic radiosurgery in the Western Hemisphere.

Most who inquire about stereotactic radiosurgery have questions. We try to answer those questions in many different ways. The first is by calling our physicians at 212-CHOICES, another is to e-mail questions to us at GIL.LEDERMAN@RSNY.ORG We also have seminars open to the public where we discuss the general principles of this technology and show a variety of examples of our work. These are conducted at no charge. Also, our expert panel of physicians meets on a regular basis to review prospective candidates’ films, reports and medical history at no charge. Consultations are also available with our physicians. Whatever is best for the patient - either an informal open meeting, a conversation on the phone with one of our physicians, or a personal consultation - is available at Radiosurgery New York.
We are always looking for new angles to successfully attack brain tumors at Radiosurgery New York. Imagine a new world where brain tumors can be treated innovatively using non-invasive focused radiation to attack the benign or malignant tumor while decreasing the field of radiation to protect healthy, normal tissue. It’s a world where fractionated stereotactic radiosurgery (FSR) avoids the invasiveness of surgery. Each treatment is outpatient and carried out in about 30 minutes with no anesthesia, sedation, pins or cutting.
Our new world of FSR is different compared to single fraction radiosurgery and open surgery. Imagine that our sophisticated fractionated stereotactic procedure takes place in a center whose doctors have experience with the evaluation and treatment of thousands of patients. It’s our doctors’ data and experience that makes such a difference – another one of our angles – like the directed treatment we offer.

Fractionation for standard radiation has been used for decades elsewhere in the body. Fractionation offers special appeal for stereotactic radiosurgery in the brain. It helps lessen adverse effects and yet has the potential to focus the radiation dose to selected tumors. Fractionation means accurate treatment using radiosurgery while avoiding the pain, the medications and hospitalization associated with the single-fraction pins-into-the-skull method. These should be some of the attributes that most seek when selecting treatment for benign or malignant tumors. Also, results matter.

Fractionated stereotactic radiosurgery represents the leading technologic edge for patients with benign and malignant brain tumors. Work pioneered by our physicians of Radiosurgery New York and presented at national and international medical meetings continues to show appeal compared to other methods of treatment.

From the inception nearly 50 years ago and through continued improvement and refinement, stereotactic radiosurgery has succeeded in delivering radiation to tumors. Now it’s offered in a non-invasive, fractionated manner. What is so different now is our experience. We’ve performed tens of thousands of radiosurgeries. Continued on next page.
For patients with either newly diagnosed or recurrent brain tumors whether standard radiation, surgery or chemotherapy has been previously administered, fractionated stereotactic radiosurgery might be an exciting treatment option to consider. The beauty of our program is, as well, our ability to treat—or even re-treat brain tumors despite prior radiation, chemo or surgery. Our experience in re-treated brain cancer is perhaps the largest worldwide.

Furthermore with fractionated stereotactic radiosurgery there is, in general, the avoidance of hospitalization. It is for this reason and the strong voices from successfully treated patients that enthusiasm has been stimulated globally for the fractionated stereotactic radiosurgery approach at Radiosurgery New York. Many times, previously treated patients are our most ardent supporters—passing on to friends and family a new treatment option.

Because treatment is totally non-invasive, patients maintain their normal function throughout this process. Patients are completely awake and alert throughout the entire painless, non-invasive, non-claustrophobic procedure.

Fractionated stereotactic radiosurgery directs computer-guided beams of radiation from many different angles all to converge on the tumor. Fractionated stereotactic radiosurgery is symbolic of an advanced age of medical science in which patients with benign and malignant tumors once considered impossible or difficult to treat can receive highly focused, outpatient therapy.

For patients with either newly diagnosed or recurrent brain tumors whether standard radiation, surgery or chemotherapy has been previously administered, fractionated stereotactic radiosurgery might be an exciting treatment option to consider. The beauty of our program is, as well, our ability to treat—or even re-treat brain tumors despite prior radiation, chemo or surgery. Our experience in re-treated brain cancer is perhaps the largest worldwide.

Fractionated stereotactic radiosurgery directs computer-guided beams of radiation from many different angles all to converge on the tumor.
A primary difference between standard radiation and fractionated stereotactic radiosurgery is that standard radiation must - because of less precision - radiate large amounts of normal healthy brain - compared to radiosurgery, which focuses on the tumor. Radiation of healthy brain usually cannot be construed as always optimal and may, in fact, lead to complications. Radiosurgery represents the opposite end of the spectrum from standard radiation - focused directed radiation with prescribed doses of treatment.

Think of a plum in a breadbox and imagine the plum is the tumor while the brain is the breadbox. Standard radiation treats the larger breadbox while we isolate the plum for treatment. That means we can escalate the dose to the tumor and diminish much of the unnecessary dose to normal brain tissue. That should mean less chance of late adverse effects. Stereotactic radiosurgery has a greater degree of accuracy than just conformal radiation. There are issues concerning risks, benefits and alternatives that must be discussed. While IMRT (Intensity Modulated Radiation Therapy) helps shape the radiation, it is only one part of our innovative program.

**ACOUSTIC NEUROMA** - Our physicians have the largest experience worldwide using FSR for Acoustic Neuroma treatment. On the left is an Acoustic Neuroma before FSR and the image at right shows marked shrinkage of the AN after this non-invasive outpatient treatment.
HOW DOES ONE CONSIDER THEIR CANDIDACY FOR FRACTIONATED STEREOTACTIC RADIOSURGERY PROGRAM?

Every week our expert physicians review submitted cases from around the world for consideration of fractionated stereotactic radiosurgery. We attempt to fully inform the patient to make the best decision based upon most effective and least invasive techniques available.

All who contact us are sent a package of information including an informative videotape. For those inquiring from overseas, videotapes are available in the PAL format. We also have DVDs. There are regular seminars concerning brain radiosurgery. There is no obligation or charge to any that send MRI or CT scans for review. Our multi-disciplinary panel consisting of expert physicians review pathology, scans and clinical history.

Continued on center of page 10.

HOW DOES FRACTIONATION OF RADIOSURGERY HELP THE PATIENT?

Radiation oncologists believe that higher doses of radiation are more beneficial in curing cancer, in general, than lower doses. However, higher doses cannot be given innocuously. Essentially, all tumors are surrounded by normal tissue. It is the presence of the normal tissue that limits the amount of radiation that can be safely administered. It’s our physicians’ large experience that helps to know when to increase or decrease doses! For benign conditions – such as acoustic neuromas – we are famous for using the lowest biologic effective dose in order to effectively treat the tumor and minimize harm to the surrounding fifth, seventh, eighth cranial nerves and brain stem. It’s for the patients’ benefit.

Continued on next page.

BRAIN METASTASES - are commonly treated with FSR with a high degree of tumor control, the tumor is seen before treatment on the left scan and shrunken after treatment on the right. Many of our patients avoid whole brain radiation.

BEFORE FSR

AFTER FSR
The desired treatment is one that produces the most appropriate and beneficial doses of radiation delivered to the tumor while minimizing adverse effects to the normal healthy brain.

Fractionation allows healthy, surrounding tissues to potentially repair radiation effects in a way that single fraction radiosurgery cannot. Our system permits us the ability to fractionate - or divide - the dose, which is based upon biologic principles to make treatment safer. This is true for benign tumors such as acoustic neuromas, meningiomas and pituitary tumors, as well as malignancies.

We have the largest experience worldwide using fractionated stereotactic radiosurgery for acoustic neuromas. Fractionation exploits the difference between normal tissues and tumors thus resulting in a safer and superior outcome. This is why fractionated stereotactic radiosurgery is so important. Scientists have known for decades the potential benefits of fractionation; that’s why we are the leaders in fractionated stereotactic radiosurgery.  

Continued from page 9
Patients considered candidates for this technique are invited in for consultation. During this consultation, a history, physical examination, newer films (if they exist), pathology and other records are re-reviewed. We have a large group of experts on hand to answer your questions.

Continued on top of next page.
Another major difference between single shot radiosurgery and fractionated stereotactic radiosurgery is that our system is non-invasive avoiding pins in the skull, which causes discomfort and limits usefulness of the technique. Unlike single shot radiosurgery, we have an unlimited array of beam sizes – custom-made - for tumor treatment ranging from the very small to the very large. But today, there’s much more! We have custom-shaped fields and multi-leaf collimation and IMRT. IMRT, a small part of our overall program, is intensity modulated radiation therapy. Also, our planning systems are new and state-of-the-art.

The desired treatment is one that produces the most appropriate and beneficial doses of radiation delivered to the tumor while minimizing effects to the normal healthy brain.

Fractionated stereotactic radiosurgery helps us achieve this goal most elegantly. This booklet discusses the benefits in brief. For more information about your specific condition, please speak to our physicians. Call us at 212-CHOICES or e-mail questions to GIL.LEDERMAN@RSNY.ORG.

Our physicians, based on your exact situation, individually answer more specific questions. The best advice for a patient is to inquire. Our physicians will give a fresh second opinion offering advice and treatment options, which we believe best serve the patient.
WHAT ARE THE MOST COMMON USES OF FRACTIONATED STEREOTACTIC RADIOSURGERY?

Malignant primary tumors including astrocytomas and glioblastomas as well as metastatic cancers to the brain are frequently treated. Primary tumors commence in the brain, while metastases have spread to the brain through the bloodstream. These cancerous conditions have been - and are - extensively studied by our radiosurgery group.

With close collaboration of medical oncology, studies combining special radiation-enhancing well-tolerated chemotherapeutic agents - such as Taxol - have been regularly evaluated and continue to show survival benefit compared to standard treatment or standard single shot radiosurgery for those with newly diagnosed as well as recurrent small or large primary brain tumors - like glioblastomas, astrocytomas and other aggressive cancers. With Taxol and fractionated radiosurgery given concurrently, the survival rates are superior even for recurrent glioblastoma multiforme patients.

A greater benefit is seen adding our immunotherapy program after fractionated radiosurgery. Our data for the treatment of recurrent high-grade primary brain tumors like glioblastomas is appealing – using fractionated radiosurgery followed by immunotherapy.

Fractionation means a higher degree of comfort and effectiveness in radiosurgery.

Fractionation benefits are numerous. For malignant tumors, there is protection of the healthy surrounding tissue while maintaining - or improving - efficacy of treatment. In fact, studies of malignant primary brain tumors such as glioblastomas show improved survival rates compared to single-fraction radiosurgery. Furthermore, there is a much less need for subsequent operation or intervention when our techniques are implemented compared to single fraction radiosurgery.
Many patients choose radiosurgery for newly diagnosed tumors specifically to avoid standard therapy and unnecessary side effects.

Brain metastases means the cancer started elsewhere in the body and spread via the bloodstream to the brain. Our work shows benefit from fractionated stereotactic radiosurgery for those with single or multiple metastases - even when not successfully treated by prior surgery or radiation. Fractionated radiosurgery allows treatment of larger cancers or those in the most delicate parts of the brain (like the brainstem area or by delicate cranial and optic nerves) - with a greater degree of safety than other methods of standard radiosurgery.

For many patients with brain metastases, radiosurgery may replace the need for whole brain radiation. Whole brain radiation radiates the normal healthy tissues. Many patients choose radiosurgery for newly diagnosed tumors specifically to avoid standard therapy and unnecessary side effects. Other patients select radiosurgery for brain metastases that have remained or grown despite standard radiation or surgery. Most patients are treated in four separate sessions each lasting about 30 minutes. We have extensive experience treating brain metastases – and find it best to discuss each situation based upon the clinical facts and the patient’s desires – after the Informed Consent process. Continued on next page.
Radiation-enhancers are highly effective in head and neck cancers. Taxol is not particularly effective by itself, but is used in sensitizing the tumor - or making the cancer more susceptible - to the effects of fractionated stereotactic radiosurgery.

When treated with unique approaches pioneered by our physicians, cancers of the Head and Neck area have high response rates. These cancers include the nasopharynx, maxillary sinus and other primary sites within this crucial area of the body. Many come to us after standard radiation, chemotherapy and/or surgery failed to work.

The most common benign tumors treated by our expert physicians include meningiomas and acoustic neuromas as well as pituitary tumors. Other neuromas and schwannomas are treated with a high degree of confidence.

Fractionation for benign tumors like acoustic neuromas means the toxicity of treatment is markedly diminished compared to single fraction radiosurgery or open surgery. While there are no guarantees, people with acoustic neuromas treated here are more likely to maintain hearing, facial and trigeminal nerve function, avoid hospitalization and surgery. Fractionation of low dose radiosurgery helps to protect the vital fifth, seventh and eighth cranial nerves. Our program is unique in many regards. It is the largest fractionated program worldwide. It uses the lowest biologic dose worldwide – and the majority of our patients maintain or improve their hearing. Also, it is protective of the nearby brainstem. Treatment is most commonly given in five sessions.
After open surgery the vast majority of patients with acoustic neuromas lose hearing and many lose facial function - a marked physical and psychological calamity. Many patients have had surgery before coming to us. The tumors had returned after primary surgery and then the patient requests fractionated radiosurgery in order to help solve their dilemma. Often, people are not familiar about recurrence rates after open surgery.

With fractionated stereotactic radiosurgery developed by our group for acoustic neuromas, the likelihood of facial paralysis is minimal, as is trigeminal neuropathy. Audiology evaluation shows that 80% of our patients maintain hearing at the same or better level while having an exceptionally high success rate with this approach. All treatment is administered as outpatient therapy. Most from around the world take advantage of a short stay in New York to see the sights and go shopping during this short course of FSR.

Pituitary tumors, another benign condition, are most commonly treated successfully here using fractionated stereotactic radiosurgery. By fractionation the important nerves for vision - optic nerves and chiasm - are protected while highly effective non-invasive therapy is administered. Many prefer fractionated radiosurgery to standard radiation, open surgery or prolonged use of medicines. Fractionated stereotactic radiosurgery for pituitary tumors minimizes treatment field while focusing on the tumor. This approach offers much appeal over conventional treatment.

While there are no guarantees, people with acoustic neuromas treated here are more likely to maintain hearing, facial and trigeminal nerve function, avoid hospitalization and surgery.

The majority of our patients maintains or improves hearing based upon baseline levels. Furthermore, the likelihood of harm to the delicate fifth or seventh cranial nerves is markedly diminished. Many people ask about treatment of acoustic neuromas that are adjacent or compressing the brainstem. Many people’s acoustic neuroma does indeed compress the brainstem. We have a vast experience with safety and efficacy. We are also able to treat small tumors down to 0.1cc even within the acoustic auditory canal itself. Our physicians’ largest acoustic neuroma treated was 35 cubic centimeters. The appeal of our treatment is our high control rate and quality of life.
Patients with meningiomas come for fractionated radiosurgery especially when located around crucial blood vessels and nerves. Tumors are frequently incompletely-resected or regrow after surgical resection. Others simply do not want surgery and its associated hospitalization and convalescence. Fractionated radiosurgery can be used primarily in place of surgery or when surgery has failed. Thanks to fractionated radiosurgery, we can treat tumors about critical structures such as the carotid artery, optic nerve, optic chiasm and brain stem. We frequently treat meningiomas in the most difficult areas of the brain – in place of surgery or standard radiation. Each circumstance is unique – that is why we review the materials, films and patient first.

Results of newly diagnosed meningiomas show the vast majority – over 95% - are successfully treated and need no further treatment. Even those patients who have had prior surgery can be treated with most likely a successful outcome. Success or control of tumors means cessation of growth, shrinkage or disappearance of the abnormality on imaging. Many people come to us with tumors that were thought impossible to treat otherwise – which for us are done on a routine basis. Some ask whether there is an issue of claustrophobia undergoing treatment. Our answer is simple – No.

Arteriovenous malformations - entangled blood vessels within the brain that are prone to bleed causing stroke or even death - remain an important indication for radiosurgery. Patients are treated with especially close neuroradiologic and neurosurgical collaboration. Treatment of AVM’s requires angiography at the time of treatment to best define the shape, contour and size of these potentially fatal weakened blood vessels - that are prone to bleed. Success - meaning obliteration of arteriovenous malformations - is high using radiosurgery - a time-proven technique.

Of course, many other tumors - perhaps too numerous to mention in this short brochure - are treated by the experts at RSNY. Our group has experience with many more unusual tumors such as craniopharyngiomas, chordomas, hemangioblastomas, oligodendrogliomas, ependymomas, glomus tumors, medulloblastomas and many others. Since each person is unique, we encourage your questions and interaction.

We have a special program for head and neck cancers – many we see come to us after prior surgery, chemo or radiation have not produced the desired results. Our panel of experts may help.
These examples are used for illustration purposes only and do not represent a promise or guarantee of treatment outcome.
Recurrent Glioblastoma before and 6 years after FSR.

Recurrent Glioblastoma before and after FSR.

Glioblastoma before and 1 year after FSR.

Recurrent Glioblastoma before and 14 years after treatment; cancer free today.

Meningioma before and 15 years after treatment.

Meningioma before and after FSR.

Meningioma before and after FSR.

Meningioma before and after FSR.
Metastatic cancer to the left neck before and after FSR.

After FSR 6 months later, marked resolution to the cancer in the treatment field.

Esthesioneuroblastoma - recurrent and metastatic before FSR.

Massive Multi-Focal Esthesioneuroblastoma before and after FSR.

Massive Multi-Focal Esthesioneuroblastoma before and after FSR.

Massive Squamous cancer to the ear area before and after FSR.

Massive Squamous cancer to the ear area before and after FSR.
So, Why Come To Us?

Our years of experience, our expertise in the field, and devotion to seeking the best treatment for each patient provide a level of care that is unparalleled. Since we carefully evaluate each patient with a sophisticated panel of experts in their field, one readily senses confidence and trust. Our previously treated patients frequently recommend us - an ultimate vote of confidence in our systems. If interested, one should send appropriate records and current radiographic scans to our Brain Radiosurgery Conference. There, on a weekly basis, all submitted material is reviewed and each patient is considered individually for best treatment. There is no charge for this review. If questions arise at any time, call us directly.

Our radiosurgery work continues to be evaluated and updated by our research group and our current results are presented at national and international meetings. Specific details for you are best available through discussions with our physicians.

Dr. Gil Lederman
Founder
Radiosurgery New York

From his home in Iowa where he attended the University Of Iowa School Of Medicine to Harvard Medical School where he was trained in Medical Oncology at the Harvard Medical School Dana Farber Cancer Center and the Harvard Medical School Joint Center for Radiation Therapy, he has been a thoughtful advocate of innovative treatment for those with brain tumors. He is Board Certified in Radiation Oncology, Medicine Oncology and as well, Internal Medicine. He was trained in Internal Medical at the combined Michael Reese/University of Chicago program. Dr. Lederman has personally treated thousands of people with benign and malignant brain tumors. The data in this book represents his own personal experience with brain radiosurgery from the first treated patient.

For more information or to speak to one of our physicians about a fresh second opinion, please contact us at:

Radiosurgery New York
Cabrini Medical Center
227 East 19th Street
New York, New York 10003

Phone: 212-CHOICES or 212-995-6700
Overseas phone: 001-212-995-6700

Fax Number: 212-995-6688
e-mail: GIL.LEDERMAN@RSNY.ORG
Website: WWW.RSNY.ORG
1. An extensive experience having performed tens of thousands of procedures using fractionated stereotactic radiosurgery.

2. An experienced, compassionate team devoted to sophisticated patient care.

3. State-of-the-art equipment including IMRT plus fractionated stereotactic radiosurgery.


5. Delivery of non-invasive, outpatient, non-claustrophobic treatment avoiding pins into the skull and hospitalization of other single fraction or invasive treatments.

6. Data for treatment of malignant tumors including metastases, astrocytomas, glioblastomas, and others including head and neck cancers.

7. World’s largest experience using fractionated stereotactic radiosurgery for acoustic neuromas.

8. Extensive experience treating newly diagnosed and recurrent meningiomas and pituitary tumors.

9. An experienced panel of expert physicians to review your films, reports and medical history at no charge.


11. Multidisciplinary approach to treatment led by the physician and physicist who brought radiosurgery to New York.

12. An extensive experience, team approach that should reassure patients and their family about fractionated stereotactic radiosurgery - and all treatment options.