Corporate Medical Policy

Radiosurgery, Stereotactic Approach

File Name:	radiosurgery_stereotactic_approach
Origination:	6/1984
Last CAP Review:	5/2010
Next CAP Review:	5/2011
Last Review:	5/2011

Description of Procedure or Service

Stereotactic Radiosurgery

Stereotactic radiosurgery (SRS) is a method of delivering high doses of ionizing radiation to small targets. The technique differs from conventional radiotherapy, which involves exposing large areas of tissue to relatively broad fields of radiation over a number of sessions. SRS entails delivering highly focused convergent beams in a single session, so that only the desired target is radiated, sparing adjacent structures.

The two main methods of this technology are gamma-ray radiosurgery (Gamma Knife®) and linear-accelerator radiosurgery (LINAC).

The differences in the various sources are summarized in the following table:

Device	**Energy Source**	**Characteristics of Energy Emitted**
Gamma Knife®	201 separate cobalt-60 sources arranged in a steel shell; beams intersect on target	gamma rays, consisting of two photons with an average energy of 1.25 MeV.
Linear accelerator adapted for stereotactic use	single beam of x-rays, rotated to produce multiple intersecting beams	x-rays consisting of photons with an average energy of 2MeV

The above table shows that the Gamma Knife® and linear accelerator systems are similar in concept. Both use multiple photon radiation beams or arcs that intersect at a stereotactically determined target. This permits higher doses of radiation to be delivered while sparing surrounding normal tissues. The difference between them relate to how the energy is produced (i.e., through decaying cobalt or from x-rays) and the number of energy sources used (multiple energy sources in the Gamma Knife® versus one in the linear accelerator system).

The radiosurgical procedure is preceded by a process of localizing the target, which can be performed with one or more of the following techniques: cerebral angiography, computerized tomography (CT), and magnetic resonance imaging. SRS is typically performed in one session, usually requiring no more than an overnight hospital stay.

Stereotactic body radiation therapy (SBRT) refers to stereotactically guided radiation therapy that is given over several days. This fractionated form of radiation therapy is made possible by the recent availability of noninvasive repositioning devices that can be used in lieu of a head frame. Stereotactic body radiation therapy (SBRT) is based on the basic radiobiologic principle that fractionation decreases the short- and long-term side effects of radiation therapy. In some settings, this permits higher total dosage to be given.

Image-guided radiosurgery or radiotherapy is a relatively new development collectively describing units with real-time image guidance. Examples include the CyberKnife® device, BrainLAB Novalis®, TomoTherapy®, and LINAC with CT.

Applications of Stereotactic Radiosurgery (SRS)

The most common applications of SRS include treatment of intracranial tumors and malignancies, including primary and metastatic tumors, acoustic neuromas, and other benign intracranial tumors such as meningiomas or pituitary adenomas. SRS has been used for trigeminal neuralgia that is resistant to other therapies. It is also an established treatment for arteriovenous malformations (AVMs). More recently, SRS has been investigated as a treatment of functional disorders, which are defined as conditions having no detectable organic cause. Examples of functional disorders include chronic pain. SRS is also being studied for treatment of extracranial sites including lung tumors, liver tumors, and spinal lesions.

Intracranial metastases have been considered ideal targets for radiosurgery due to their small spherical size and non-infiltrative borders. Brain metastases are a frequent occurrence, seen in 25 to 30% of all patients with cancer, particularly in those with lung, breast, colon cancer or melanoma. The treatment of primary brain tumors such as gliomas is more challenging due to their generally larger size and infiltrative borders.

Acoustic neuromas are benign tumors originating on the eighth cranial nerve, and they can be seen in association with neurofibromatosis. Although these tumors are benign, they are associated with significant morbidity and even death if their growth compresses vital structures. Treatment involves complete surgical excision using microsurgical techniques, but radiosurgery has also been used extensively, either as a primary treatment or as a treatment of recurrence after incomplete surgical resection. In fact, acoustic neuromas were one of the first indications for stereotactic radiosurgery, dating back to 1969.

Pituitary adenomas are benign tumors with symptoms that are related to hormone production (i.e., functioning adenomas) or to neurologic symptoms due to their impingement on surrounding neural structures. Treatment options for pituitary adenomas include surgical excision, conventional radiation therapy, or SRS. Surgical excision is typically offered to patients with functioning adenomas, since complete removal of the adenoma leads to more rapid control the autonomous hormone production. The effects of stereotactic radiosurgery on hormone production are delayed or incomplete. In patients with non functioning adenomas, the treatment goal is to control growth; complete removal of the adenomas is not necessary. Conventional radiation therapy has been used in this setting with an approximate 90% success rate with few complications.

Arteriovenus malformations consist of a tangled network of vessels in which blood passes from arteries to veins without intervening capillaries. They range in size from small, barely detectable lesions to huge lesions that can occupy an entire hemisphere. SRS incites an inflammatory response in the vessels, which results in ongoing fibrosis with eventual complete obliteration over a course of months to years. This latency period is variable, depending on the size of the AVM and the dose distribution of the radiosurgery. During this latency period, there is an ongoing but declining risk of hemorrhage. In contrast, surgical excision provides an immediate effect on the risk of hemorrhage. Total surgical extirpation of the lesion, if possible, is the desired form of therapy in order to avoid future hemorrhage. However, a small subset of AVMs because of their size or location cannot be excised without serious neurological sequelae. SRS is an important alternative in these patients.

Trigeminal neuralgia is a disorder of the fifth cranial (trigeminal) nerve that causes episodes of intense, stabbing pain in the face. Although trigeminal neuralgia is initially treated medically, in a substantial number of cases, drug treatment is either ineffective or the adverse effects become intolerable. Neurosurgical

options include microvascular decompression, balloon compression, and rhizotomy. SRS has been investigated as an alternative to these neurosurgical treatments.

Seizure disorders are initially treated medically. Surgical treatment is only considered in those rare instances when the seizures have proven refractory to all attempts at aggressive medical management, when the seizures are so frequent and severe as to significantly diminish quality of life, and when the seizure focus can be localized to a focal lesion in a region of the brain that is amenable to resection. SRS has been investigated as an alternative to neurosurgical resection.

For chronic pain that is refractory to a variety of medical and psychological treatments, there are a variety of surgical alternatives. Neurodestructive procedures include cordotomy, myelotomy, dorsal root entry zone (DREZ) lesions, and stereotactic radiofrequency thalamotomy. SRS targeting the thalamus has been considered as an alternative to these neurodestructive procedures.

Stereotactic body radiation therapy (SBRT) is being studied for treatment of extracranial sites including lung tumors, liver tumors, and spinal lesions. This approach is being studied to better target lesions (sparing surrounding normal tissue) and to shorten the length of time needed to complete the treatment.

Related Policies:
Charged Particle Radiotherapy, Proton or Helium Ion

******Note: This Medical Policy is complex and technical. For questions concerning the technical language and/or specific clinical indications for its use, please consult your physician.***

Policy

BCBSNC will provide coverage for Stereotactic radiosurgery or radiotherapy when it is determined to be medically necessary because the medical criteria and guidelines shown below are met.

Benefits Application

This medical policy relates only to the services or supplies described herein. Please refer to the Member's Benefit Booklet for availability of benefits. Member's benefits may vary according to benefit design; therefore member benefit language should be reviewed before applying the terms of this medical policy.

When Stereotactic radiosurgery is covered

A. Stereotactic radiosurgery using a gamma or linear accelerator (LINAC) unit may be considered **medically necessary** for the following indications:

1. Arteriovenus malformations;
2. Acoustic neuromas;
3. Pituitary adenomas;
4. Non-resectable, residual, or recurrent meningiomas;
5. Solitary or multiple brain metastases in patients having good performance status and no active systemic disease (defined as extracranial disease that is stable or in remission);
6. Primary malignancies of the CNS, including but not limited to high-grade gliomas (initial treatment or treatment of recurrence);
7. Trigeminal neuralgia refractory to medical management or in cases where the patient is unable to tolerate the side effects of medications.

B. Stereotactic Body Radiotherapy (SBRT) with may be considered medically necessary for the following indications:

1. Patients with stage T1 or T2a non-small cell lung cancer (not larger than 5 cm) showing no nodal or distant disease and who are not candidates for surgical resection;
2. Spinal or vertebral body tumors (metastatic or primary) in patients who have received prior radiation therapy.

When Stereotactic radiosurgery is not covered

1. Stereotactic radiosurgery is considered investigational for any indications other than those listed above.
2. Stereotactic radiosurgery is considered investigational for the following applications including, but not limited to, the treatment of seizures and functional disorders other than trigeminal neuralgia, including chronic pain.
3. Stereotactic body radiation therapy (SBRT) is considered investigational for the treatment of extracranial sites, except for the cases of spinal tumors after prior radiation therapy and stage 1 non-small cell lung cancer as noted above.

Policy Guidelines

Refer to the individual member's benefit booklet for prior review requirements.

SRS is typically performed in one session, usually requiring no more than an overnight hospital stay.

For the initial or recurrent SRS treatment of solitary or multiple brain metastases in patients without extracranial disease**,** the patient should have good performance status.

For the initial SRS treatment of solitary or multiple brain metastases with extracranial disease, patients should have good performance status AND one of the following:

a. be newly diagnosed,
b. have stable disease, or
c. have reasonable systemic treatment options.

For recurrent SRS treatment of brain metastases patients should have good performance status AND have one of the following:

a. stable extracranial disease, or
b. reasonable systemic treatment options.

SRS is a multistep procedure involving the following:

- localization of the target (responsibility of the radiation oncologist)
- radiation dose planning (responsibility of the radiation oncologist)
- attachment of the stereotactic head frame to the patient (responsibility of the neurosurgeon)
- actual radiosurgery (may be done by either the radiation oncologist or the neurosurgeon)
- removal of the head frame (responsibility of the neurosurgeon)

Billing/Coding/Physician Documentation Information

This policy may apply to the following codes. Inclusion of a code in this section does not guarantee that it will be reimbursed. For further information on reimbursement guidelines, please see Administrative Policies on the Blue Cross Blue Shield of North Carolina web site at www.bcbsnc.com. They are listed in the Category Search on the Medical Policy search page.

Applicable codes: 20660, 61781,61782,61783, 61796, 61797, 61798, 61799, 61800, 63620, 63621, 77331, 77332, 77333, 77334, 77370, 77371, 77372, 77373, 77402, 77403, 77404, 77406, 77407, 77408, 77409, 77411, 77412, 77413, 77414, 77416, 77432, 77435, G0173, G0251, G0339, G0340.

BCBSNC may request medical records for determination of medical necessity. When medical records are requested, letters of support and/or explanation are often useful, but are not sufficient documentation unless all specific information needed to make a medical necessity determination is included.

Scientific Background and Reference Sources

BCBSA Medical Policy Reference Manual - 12/95

BCBSA Medical Policy Reference Manual - 1/30/98

BCBSA Medical Policy Reference Manual - 11/98

Medical Policy Advisory Group - 12/99

Specialty Matched Consultant Advisory Panel - 8/01

BCBSA Medical Policy Reference Manual, 6.01.10; 12/18/02

Specialty Matched Consultant Advisory Panel - 7/03

BCBSA Medical Policy Reference Manual [Electronic Version]. 6.01.10, 4/16/2004

Specialty Matched Consultant Advisory Panel - 6/2005

BCBSA Medical Policy Reference Manual [Electronic Version]. 6.01.10, 7/20/2006

Specialty Matched Consultant Advisory Panel - 5/2007

Specialty Matched Consultant Review - 8/2008

National Comprehensive Cancer Network. NCCN Clinical Practice Guidelines in Oncology, Non-small cell lung cancer. V.2.2009. Retrieved 10/22/2008 from http://www.nccn.org/professionals/physician_gls/PDF/ nscl.pdf

BCBSA Medical Policy Reference Manual [Electronic Version]. 6.01.10, 12/11/08

Specialty Matched Consultant Advisory Panel - 5/2009

BCBSA Medical Policy Reference Manual [Electronic Version] 6.01.10, 02/2010

Specialty Matched Consultant Advisory Panel- 5/2010

BCBSA Medical Policy Reference Manual [Electronic Version] 6.01.10, 9/16/2010

Senior Medical Director – 5/2011

Policy Implementation/Update Information

6/84 Original policy: proton beam radiotherapy generally accepted medical practice for

	arteriovenous malformations. Issued as Advice to plans 9/84 Newsletter. Evaluated and reversed 3/88.
3/88	Evaluated: gamma beam radiosurgery eligible for coverage for selected patients with arteriovenous malformations. Proton beam radiosurgery eligible for coverage for second line treatment of pituitary microadenoma.
7/89	Evaluated: proton beam radiosurgery eligible for coverage for first line treatment of pituitary microadenoma. Gamma beam radiosurgery investigational for acoustic neuroma.
8/92	Evaluated and eligible for coverage: gamma beam radiosurgery for acoustic neuromas, helium ion radiosurgery for selected arteriovenous malformations and pituitary.
8/92	Evaluated and investigational: gamma beam radiosurgery for angiographically occult arteriovenous malformations, meningiomas, brain metastases and pituitary adenomas; helium ion radiosurgery for angiographically occult arteriovenous malformations; linear accelerator radiosurgery for arteriovenous malformations, meningiomas, brain metastases and pituitary adenomas; neutron beam radiosurgery for arteriovenous malformations.
9/93	Revised.
11/94	Evaluated: Gamma beam radiosurgery and linear accelerator radiosurgery are eligible for coverage for initial treatment of solitary brain metastasis.
6/96	Revised: National Association reviewed 12/95.
9/98	Reviewed: Adopted BCBSA's policy issued 1/30/98.
6/99	Reformatted, Medical term Definitions added.
12/99	Medical Policy Advisory Group
10/00	System coding changes.
12/00	77520, 77522, 77523, 77525 added to coding section. System coding changes.
7/01	Policy name changed from Stereotactic Radiosurgery to Radiosurgery, Stereotactic Approach.
9/01	Specialty Matched Consultant Advisory Panel - 8/01. Approved. Format changes. Typos corrected.
10/01	Format changes.
08/03	Specialty Matched Consultant Advisory Panel review 7/15/2003. Benefits Application section revised. Under "When covered" section: 5th bullet - removed "up to three" and replaced with "multiple"...to indicate that stereotactic radiosurgery is no longer limited to 3 or fewer metastases; 6th bullet - added "primary malignancies of the CNS, including but not limited to..."; 7th bullet-added "or in cases where the patient is unable to tolerate the side effects of medications". Typos corrected. Added CPT codes 77402-77416 and HCPCS Level II codes G0173, G0242, G0243 to Billing/Coding section.
7/7/05	Specialty Matched Consultant Advisory Panel review 6/24/2005. No changes to policy intent. Removed the statement, "The most common applications of SRS include treatment of intracranial metastases, arteriovenous malformations, acoustic neuromas (benign tumors originating on the eight cranial nerves), or other benign intracranial tumors such as meningiomas or pituitary adenomas." from first paragraph of the "Description of Procedure or Service" because this is addressed later in the description. Added "functional disorders other than trigeminal neuralgia, such as" to the statement associated with the first bullet under "When not covered". Policy number added to "Key Words" section. References added.
1/19/06	Added "Cyberknife is a novel new technology of delivering radiation with a lightweight linear accelerator (LINAC) device utilizing a robotic manipulator to permit a wide range of beam orientations." to "Description of Procedure or Service" section. HCPS codes G0339, G0340, 0082T, and 0083T added to "Billing/Coding" section. Deleted HCPCS G0242 from

	"Billing/Coding" section. Added "Cyberknife" to "Policy Key Words" section.
1/3/07	Added the following new 2007 CPT codes to the "Billing/Coding" section: 77371, 77372, 77373, 77435, 0169T. Deleted CPT codes 0082T and 0083T and HCPCS code G0243 from "Billing/Coding" section.
8/13/07	Specialty Matched Consultant Advisory Panel review 5/23/2007. Updated "Description section regarding stereotactic radiotherapy and added information related to stereotactic radiosurgery of extracranial sites. Expanded the 5th bullet in the "When Covered" section to include; "solitary or multiple brain metastases (up to 3) in patients having good performance status and no active systemic disease **or** patients with active systemic disease when the treatment is likely to improve the functional status of the patient" Clarified "When not covered" section; first bullet, added "cluster headaches and chronic pain" as examples of functional disorders, and second bullet "Stereotactic radiosurgery for the treatment of extracranial sites (i.e., stereotactic body radiosurgery)." Removed reference to "fractionated stereotactic radiotherapy" from "When not covered" section. Removed CPT code 0169T from "Billing/Coding" section as it is not specific to this policy. References added.
7/6/09	Specialty Matched Consultant review 8/8/2008. Reviewed with Senior Medical Director 3/23/09. Specialty Matched Consultant Advisory Panel Review 5/28/09. "Description" section updated. Revised the following in the "When Covered" section to remove the statement: "5.) ...or patients with active systemic disease when the treatment is likely to improve the functional status of the patient;" and inserted "and no active systemic disease (defined as extracranial disease that is stable or in remission)". Added additional indications: "B. Stereotactic Body Radiotherapy (SBRT) with Gamma knife®, Cyberknife®, or linear accelerator (LINAC) may be considered medically necessary for the following indications: 1.) Patients with stage 1 non-small cell lung cancer showing no nodal or distant disease and who are not candidates for surgical resection; 2) Spinal or vertebral body tumors (metastatic or primary) in patients who have received prior radiation therapy." Added to the "When not covered" section: "3.) Stereotactic body radiosurgery therapy (SBRT) is considered investigational for the treatment of extracranial sites, except for the cases of spinal tumors after prior radiation therapy and stage 1 non-small cell lung cancer as noted above." Added the following statement to the "Policy Guidelines" section: "Refer to the individual certificate for prior review/precertification requirements." Added new CPT codes 61795, 61796, 61797, 61798, 61799, 61800, 63620, 63621 and new HCPCS code, G0251 to the "Billing/Coding" section. Removed deleted CPT code 61793. Removed the following CPT codes: 77520, 77522, 77523 and 77525, as they no longer relate to this policy. References added. (btw)
6/22/10	Specialty Matched Consultant Advisory Panel review 5/24/10. Under "When covered" section: 5th bullet - removed "up to three" to indicate that stereotactic radiosurgery is no longer limited to 3 or fewer metastases. Medical Policy number removed. References added.(lpr)
11/23/10	Reordered CPT code 77435 so that it appears in the proper numerical sequence in the Billing/Coding section. (lpr)
1/4/2011	Added new CPT codes 61781, 61782, 61783 to Billing/Coding section. Removed deleted CPT code 61795. (lpr)
5/24/11	"Description" section revised. Added "T1 or T2a" and "(not larger than 5 cm) to B.1. under the "When Covered" section. Specified "chronic" pain in statement 2 under the "When Not Covered" section. Added the following statement to the "Policy Guidelines" section: For the initial or recurrent SRS treatment of solitary or multiple brain metastases in patients without extracranial disease, the patient should have good performance status. For the initial SRS treatment of solitary or multiple brain metastases with extracranial disease, patients should have good performance status AND one of the following: a. be newly diagnosed, b. have

stable disease, or c. have reasonable systemic treatment options. For recurrent SRS treatment of brain metastases patients should have good performance status AND have one of the following: a. stable extracranial disease, or b. reasonable systemic treatment options. Reviewed with Senior Medical Director 5/2/2010. References added. (btw)