

Clinical Policy: Stereotactic Body Radiation Therapy

Reference Number: PA.CP.MP.22

Effective Date: 01/18

Last Review Date: 03/18

[Coding Implications](#)

[Revision Log](#)

Description

Stereotactic body radiation therapy (SBRT) and stereotactic radiosurgery (SRS) are radiation therapies delivered via stereotactic guidance to a small, precise target. It largely spares the surrounding tissue by multiple non-parallel radiation beams converging into one sharply defined target. It greatly reduces the amount of radiation to which the surrounding tissue is exposed. SBRT is used to treat extra-cranial sites and can be performed in one to five sessions (fractions). SRS is used to treat intra-cranial and spinal targets. SRS is typically performed in a single session but can be performed in a limited number of sessions, up to a maximum of five. Gamma-ray photons, X-ray photons, protons, helium ions, and neutrons have all been used for SBRT and SRS.

Policy/Criteria

- I. It is the policy of Pennsylvania Health and Wellness® (PHW) that up to 5 sessions of SBRT is **medically necessary** for any of the following indications:
 - A. Early stage non-small cell lung cancer (i.e., stage I-II, NO) in patients who are not surgical candidates;
 - B. Acoustic neuroma;
 - C. Localized malignant conditions in the body where highly precise application of high-dose radiotherapy is required, including tumors of any type arising in or near previously irradiated regions;
 - D. Recurrences of metastatic spine cancer after previous radiation.²³
 - E. Hepatocellular carcinoma, as an alternative to ablation/embolization techniques or when these therapies have failed or are contraindicated
- II. It is the policy of PHW that up to 5 sessions of SRS are **medically necessary** for any one of the following indications:
 - A. Cranial indications when unresectable due to its deep intracranial location or member is unable to tolerate conventional operative intervention:
 1. Inoperable, small (< 3 cm) arteriovenous (AV) malformations, or
 2. Benign tumors including meningiomas, pituitary adenomas, craniopharyngiomas, hemangiomas, and neoplasms of the pineal gland; or
 - B. Small acoustic neuromas (< 3 cm) or enlarging neuromas in patients who are not candidates for surgery; or
 - C. Brain malignancies, primary and/or metastatic lesions; or
 - D. Intracranial lesions where the patient refuses surgery; or
 - E. Severe, sustained trigeminal neuralgia not responsive to other treatments, or
 - F. A booster treatment for larger cranial or spinal lesions that have been treated initially with external beam radiation therapy or surgery. Avoid SBRT when in close proximity to cranial nerves II and VIII if the maximal dose delivered exceeds 10 Gy; or
 - G. Relapse in previously irradiated cranial or spinal field where additional stereotactic precision is required to avoid unacceptable vital tissue radiation; or
 - H. Inoperable spinal tumors causing compression or intractable pain.

Stereotactic Body Radiation Therapy

- III.** PHW will consider gamma knife thalamotomy for essential tremor (ET) on a case by case basis. For ICD-10-CM code G25.0, essential tremor coverage is limited to the patient who cannot be controlled with medication, has major systemic disease or coagulopathy, and who is unwilling or unsuited for open surgery. Coverage is limited to unilateral thalamotomy. Gamma knife pallidotomy remains non-covered and will be denied.³⁰
- IV.** It is the policy of PHW that more than 5 sessions of SBRT or SRS or for indications other than listed above, is considered **not medically necessary**.

Background

Stereotactic ablative radiotherapy is also known as SBRT. SRS and SBRT both pair a high degree of anatomic targeting accuracy and reproducibility with very high doses of extremely precise, externally generated, ionizing radiation to inactivate or eradicate a defined target(s). The target is defined by high resolution stereotactic imaging. The procedure involves a multidisciplinary team often consisting of a surgeon, radiation oncologist, radiologist, medical radiation physicist, dosimetrist, radiation therapist, radiation therapy nurse and a specialist of the disease site such as a neurologist.

Stereotactic describes a procedure during which a target lesion is localized relative to a fixed 3-D reference system, such as a rigid head frame affixed to a patient, fixed bony landmarks, a system of implanted fiducial markers, or other similar system. This localization procedure allows physicians to perform image-guided procedures with a high degree of accuracy and precision.

The risk of developing permanent damage following SRS varies by the location of the lesion in the brain. Lesions located deep in the gray matter (thalamus, basal ganglia) or brainstem (pons, midbrain) carry the maximum risk of neurologic complications. Complications are less likely with lesions in the frontal and temporal lobes. Fractionated radiation therapy is often preferred to SRS for the treatment of lesions in the deep gray matter or the brainstem.

Technologies that are used to perform SBRT and SRS include Gamma Knife, LINAC, CyberKnife and proton beam or heavy-charged-particle radiosurgery. In order to enhance precision, various devices may incorporate robotics and real time imaging.⁴

Gamma Knife

Standard gamma knife uses 192 or 201 beams of highly focused gamma rays all aiming at the target region. The Gamma Knife is ideal for treating small to medium size lesions.

Linear accelerator- (LINAC)

LINAC machines deliver high-energy x-rays, also known as photons. It can provide treatment on larger tumors in a single session or during multiple sessions (fractionated SRT). The principles of LINAC are identical to GammaKnife.⁴

CyberKnife

This device combines a mobile LINAC machine with an image guided robotic system that delivers either a single large dose or fractionated radiation therapy. The overall length of time of treatment on a CyberKnife is typically longer than with other radiation therapy modalities.^{4 11}

CLINICAL POLICY

Stereotactic Body Radiation Therapy



Proton Beam

There is limited use of this in North America; however the number of centers has dramatically increased in the last several years. Protons are atoms that carry a positive charge. Compared to the use of photons (x-rays), the energy from protons conforms to the tumor better and causes less damage to the surrounding tissue. This allows a greater dose of radiation to be used due to minimizing the effects to normal tissue.

National Comprehensive Cancer Network

SBRT should have longer follow-up and prospective multi-institutional data to evaluate longer-term results for prostate cancer, especially since late toxicity theoretically could be worse in hypofractionated regimens compared to conventional fractionation.¹³

The World Health Organization notes the following information regarding Grade I meningiomas: stereotactic or image guided therapy is recommended when using tight margins or when close to critical structures.²³

A revision to the metastatic spine guideline notes that in selected cases or recurrences after previous radiation, SBRT is appropriate.²³

Definitive radiation therapy, particularly SBRT, is recommended for individuals with early stage non-small cell lung cancer (i.e., stage I-II, NO) who are medically inoperable or those who refuse surgery.²²

SBRT in the treatment of pancreatic adenocarcinoma should be used preferably in the context of a clinical trial and at experienced high-volume centers since the data regarding the appropriate use of SBRT for this indication is evolving.²⁵

SBRT can be considered in patients with hepatocellular carcinoma, as an alternative to ablation/embolization techniques or when these therapies have failed or are contraindicated. SBRT (1-5 fractions) is often used for patients with 1-3 tumors. SBRT could be considered for larger lesions or more extensive disease, if there is sufficient uninvolved liver and liver radiation tolerance can be respected. There should be no extra hepatic disease or it should be minimal and addressed in a comprehensive management plan. (Category 2B recommendation) 26

American Academy of Neurology

There is insufficient evidence to make recommendations regarding the use of gamma knife thalamotomy in the treatment of essential tremor.

CMS National Coverage Determination

CMS NCD 160.24 addresses indications for the use of brain stimulation (DBS) for the treatment of essential tremor (ET) and/or Parkinsonian tremor and unilateral or bilateral subthalamic nucleus (STN) or globus pallidus interna (GPi) DBS for the treatment of Parkinson's disease (PD).

Coding Implications

This clinical policy references Current Procedural Terminology (CPT®). CPT® is a registered trademark of the American Medical Association. All CPT codes and descriptions are copyrighted 2015, American Medical Association. All rights reserved. CPT codes and CPT descriptions are from the current manuals and those included herein are not intended to be all-inclusive and are included for informational purposes only. Codes referenced in this clinical policy are for informational purposes only. Inclusion or exclusion of any codes does not guarantee coverage. Providers should reference the most up-to-date sources of professional coding guidance prior to the submission of claims for reimbursement of covered services.

CPT® Codes	Description
61796	Stereotactic radiosurgery (particle beam, gamma ray, or linear accelerator); 1 simple cranial lesion
61797	Stereotactic radiosurgery (particle beam, gamma ray, or linear accelerator ; each additional cranial lesion, simple
61798	Stereotactic radiosurgery (particle beam, gamma ray, or linear accelerator; 1 complex cranial lesion
61799	Stereotactic radiosurgery (particle beam, gamma ray, or linear accelerator ; each additional cranial lesion, complex
63620	Stereotactic radiosurgery (particle beam, gamma ray, or linear accelerator); 1 spinal lesion
63621	Stereotactic radiosurgery (particle beam, gamma ray, or linear accelerator ; each additional spinal lesion
63621	Stereotactic radiosurgery (particle beam, gamma ray, or linear accelerator ; ach additionalspinal lesion
77371	Radiation treatment delivery, stereotactic radiosurgery (SRS), complete course of treatment of cranial lesion(s) consisting of 1 session; multi-source cobalt 60 based
77372	Radiation treatment delivery, stereotactic radiosurgery (SRS), complete course of treatment of cranial lesion(s) consisting of 1 session; linear accelerator based
77373	Stereotactic body radiation therapy, treatment delivery, per fraction to 1 or more lesions, including image guidance, entire course not to exceed 5 fractions
77432	Stereotactic radiation treatment management of cranial lesion(s) (complete course of treatment consisting of one session)
77435	Stereotactic body radiation therapy, treatment management, per treatment course, to one or more lesions, including image guidance, entire course not to exceed 5 fractions

HCPS	Description
G0339	Image-guided robotic linear accelerator-based stereotactic radiosurgery, complete course of therapy in one session or first session of fractionated treatment
G0340	Image-guided robotic linear accelerator-based stereotactic radiosurgery, delivery including collimator changes and custom plugging, fractionated

CLINICAL POLICY
Stereotactic Body Radiation Therapy



HCPS	Description
	treatment, all lesions, per session, second through fifth sessions, maximum five sessions per course of treatment

ICD-10-CM Diagnosis Codes that Support Coverage Criteria

ICD-10-CM Code	Description
C22.0-C22.9	Malignant neoplasm of liver and intrahepatic bile ducts
C34.01	Malignant neoplasm of right main bronchus
C34.02	Malignant neoplasm of left main bronchus
C34.11	Malignant neoplasm of upper lobe, right bronchus or lung
C34.12	Malignant neoplasm of upper lobe, left bronchus or lung
C34.2	Malignant neoplasm of middle lobe, bronchus or lung
C34.31	Malignant neoplasm of lower lobe, right bronchus or lung
C34.32	Malignant neoplasm of lower lobe, left bronchus or lung
C34.81	Malignant neoplasm of overlapping sites of right bronchus and lung
C34.82	Malignant neoplasm of overlapping sites of left bronchus and lung
C71.0	Malignant neoplasm of cerebrum, except lobes and ventricles
C71.1	Malignant neoplasm of frontal lobe
C71.2	Malignant neoplasm of temporal lobe
C71.3	Malignant neoplasm of parietal lobe
C71.4	Malignant neoplasm of occipital lobe
C71.5	Malignant neoplasm of cerebral ventricle
C71.6	Malignant neoplasm of cerebellum
C71.7	Malignant neoplasm of brain stem
C17.8	Malignant neoplasm of overlapping sites of brain
C72.0	Malignant neoplasm of spinal cord
C72.1	Malignant neoplasm of cauda equine
C72.21	Malignant neoplasm of right olfactory nerve
C72.22	Malignant neoplasm of left olfactory nerve
C72.31	Malignant neoplasm of right optic nerve
C72.32	Malignant neoplasm of left optic nerve
C72.41	Malignant neoplasm of left acoustic nerve
C72.42	Malignant neoplasm of right acoustic nerve
C72.59	Malignant neoplasm of other cranial nerve
D18.02	Hemangioma of intracranial structures
D32.0	Benign neoplasm of cerebral meninges
D33.0	Benign neoplasm of brain, supratentorial
D33.1	Benign neoplasm of brain, infratentorial
D33.3	Benign neoplasm of cranial nerves
D35.2	Benign neoplasm of pituitary gland
D35.4	Benign neoplasm of pineal gland
D43.0	Neoplasm of uncertain behavior of brain, supratentorial
D43.1	Neoplasm of uncertain behavior of brain, infratentorial

CLINICAL POLICY

Stereotactic Body Radiation Therapy

ICD-10-CM Code	Description
D43.3	Neoplasm of uncertain behavior of cranial nerves
D43.4	Neoplasm of uncertain behavior of spinal cord
D43.8	Neoplasm of uncertain behavior of other specified parts of central nervous system
D44.4	Neoplasm of uncertain behavior of craniopharyngeal duct
G25.0	Essential Tremor
G50.0	Trigeminal neuralgia
Q28.2	Arteriovenous malformations of cerebral vessels
Z51.0	Encounter for antineoplastic radiation therapy

Reviews, Revisions, and Approvals	Date	Approval Date
Added hepatocellular cancer as an indication for SBRT per NCCN; added information to background section from NCCN that SBRT in the treatment of pancreatic adenocarcinoma be used preferably in the context of a clinical trial; added to background section, that while AAN, that there is insufficient evidence to make recommendations regarding the use of gamma knife thalamotomy in the treatment of essential tremor; codes reviewed and updated.	1/18 CPC 3/18 PHW	

References

1. ACR Practice Guideline. Practice guideline for the performance of stereotactic radiosurgery. 2006(989-94).
2. American Society for Radiation Oncology (ASTRO). Stereotactic body radiation therapy (SBRT) model policy. Web page updated Dec 17, 2015. Accessed Dec 27, 2017
3. ASTRO. Stereotactic radiosurgery (SRS) model coverage policy. Jan 14, 2011. Accessed Dec 27, 2017
4. National coverage Determination(NCD) for Deep Brain Stimulation for Essential Tremor (160.24); Center for Medicare & Medicaid Services; [https://www.cms.gov/medicare-coverage-database/details/ncd-details.aspx?CALId=182&CalName=Partial+Thromboplastin+Time+\(Addition+of+ICD-9-CM++289.81%2c+Primary+Hypercoagulable+State+as+a+covered+indication\)&ExpandComments=n&CommentPeriod=0&NCDId=279&ncdver=1&CoverageSelection=Both&ArticleType=All&PolicyType=Final&s=All&CptHcpcsCode=61863&bc=gAAAABAAQEAAA%3d%3d&](https://www.cms.gov/medicare-coverage-database/details/ncd-details.aspx?CALId=182&CalName=Partial+Thromboplastin+Time+(Addition+of+ICD-9-CM++289.81%2c+Primary+Hypercoagulable+State+as+a+covered+indication)&ExpandComments=n&CommentPeriod=0&NCDId=279&ncdver=1&CoverageSelection=Both&ArticleType=All&PolicyType=Final&s=All&CptHcpcsCode=61863&bc=gAAAABAAQEAAA%3d%3d&) Accessed 5/08/18.
5. Chen, CC, Chapman, PH, Loeffler, JS. Stereotactic cranial radiosurgery. In: UpToDate, Wen Good PY (Ed), UpToDate, Waltham, MA. Accessed 2/25/2016. 1/18/2017. 12/27/17
6. Hara W. General principles of radiation therapy for head and neck cancer. In: UpToDate, Brockstein BE, Brizel DM, Posner MR (Ed), UpToDate, Waltham, MA. Accessed 2/25/15.1/18/2017. 12/27/2017. Hayes, Inc. Stereotactic Radiosurgery for Trigeminal Neuralgia and Movement Disorders. Philadelphia, PA, 2015, Accessed 03/02/2016. 1/19/17. 12/27/17

7. Heinzerling JH, Timmerman RD. Stereotactic body radiation therapy for primary and metastatic lung tumors. In: UpToDate, Jett JR, Friedberg JS, Lilenbaum RC (Ed), UpToDate, Waltham, MA. Accessed 2/26/2016. 1/18/17. 12/27/17
8. IRSA. Radiosurgery practice guideline initiative: Stereotactic radiosurgery for patients with intractable typical trigeminal neuralgia who have failed medical management. Radiosurgery Practice Guideline Report #1-03. Issued January 2009.
9. Kieran MW, Marcus KJ. Focal brainstem glioma. In: UpToDate, Loeffler JS, Wen PY, Gajjar A (Ed), UpToDate, Waltham, MA. Accessed 2/26/2016. 1/18/17. 12/27/17
10. Lederman, G, Lowry, J, Wertheim, S, et al. Acoustic neuroma; potential benefits of fractionated stereotactic radiosurgery. Stereotact Funct Neurosurg 1997;69(1-4 Pt 2): 175-82.
11. Loeffler JS, Shih HA. Radiation therapy of pituitary adenomas. In: UpToDate, Snyder PJ (Ed), UpToDate, Waltham, MA. Accessed 2/26/16. 1/18/17. 12/27/2017
12. Mitin T. Radiation therapy techniques in cancer treatment. In: UpToDate, Loeffler JS (Ed), UpToDate, Waltham, MA. Accessed 2/26/2016. 1/18/17. 12/27/17
13. National Comprehensive Cancer Network®. Prostate cancer. NCCN Clinical Practice Guidelines in Oncology. Version 1.2014. Updated Version 1.2017. Version 2.2017. www.NCCN.org
14. Noridian Healthcare Solutions. Local Coverage Determination (LCD): Stereotactic radiation therapy: Stereotactic radiosurgery (SRS) and stereotactic body radiation therapy (SBRT) L32234). Revision effective date 1/1/15. Revision effective date 7/1/16
15. Park JK, Vernick DM, Ramakrishna N. Vestibular schwannoma (acoustic neuroma). In: UpToDate, Loeffler JS, Wen PY (Ed), UpToDate, Waltham, MA. Accessed 4/11/2016. 1/19/17. 12/27/17
16. Pollock, BE, Lunsford, LD. A call to define stereotactic radiosurgery. Neurosurgery. 2004 Dec;55(6): 1371-3.
17. Radiological Society of North America. Stereotactic Radiosurgery (SRS) and Stereotactic Body Radiotherapy (SBRT). RadiologyInfo. <http://www.radiologyinfo.org/en/info.cfm?pg=stereotactic>
18. Singer RJ, Ogilvy CS, Rordorf G. Brain arteriovenous malformations. In: UpToDate, Biller J (Ed), UpToDate, Waltham, MA. Accessed 2/26/2016.1/19/17. 12/17/17
19. Synderman C, Lin D. Chordoma and chondrosarcoma of the skull base. In: UpToDate, Loeffler JS, Wen PY, Fried MP (Ed), UpToDate, Waltham, MA. Accessed 2/26/2016. 1/19/17. 12/27/17
20. The National Association for Proton Therapy. Tumors and Other Diseases Treated with Protons. <http://www.proton-therapy.org/diseases.htm>
21. Owen D, Iqbal F, Pollock BE, et al. Long-term follow-up of stereotactic radiosurgery for head and neck malignancies. Head Neck. 2015 Nov;37(11):1557-62. Epub 2014 Aug 1.
22. National Comprehensive Cancer Network. Non-Small Lung Cancer. Version 4.2017. Version 2.2018. www.NCCN.org
23. National Comprehensive Cancer Network. Central Nervous System Cancers. Version 1.2016. Version 1.2017. www.NCCN.org
24. Videtic GMM, Donington J, Giuliani M, et al. Stereotactic Body Radiation Therapy for Early Stage Non-Small Cell Lung Cancer: an ASTRO Evidence-Based Guideline American Society for Radiation Oncology (ASTRO). Pract Radiat Oncol. 2017 Sep - Oct;7(5):295-301. doi: 10.1016/j.prro.2017.04.014

Stereotactic Body Radiation Therapy

25. National Comprehensive Cancer Network. Pancreatic Adenocarcinoma. Version 3.2017
26. National Comprehensive Cancer Network. Hepatocellular Carcinoma. Version 4.2017
27. Zesiewicz TA, Elble RJ, Louis ED, et al. Evidence-based guideline update: Treatment of essential tremor. Report of the Quality Standards Subcommittee of the American Academy of Neurology. *Neurology*. 2011 Nov 8; 77(19): 1752–1755. Reaffirmed April 30, 2014
28. Curley SA, Stuart KE, Schwartz JM, et al. Nonsurgical therapies for localized hepatocellular carcinoma: Transarterial embolization, radiotherapy, and radioembolization. In: UpToDate. Waltham, MA. Accessed Jan 3, 2018
29. Caivano D, Valeriani M, Russo I, et al. Stereotactic Body Radiation Therapy in Primary and Metastatic Liver Disease. *Anticancer Res*. 2017 Dec;37(12):7005-7010.
30. Su TS, Liang P, Liang J, et al. Long-Term Survival Analysis of Stereotactic Ablative Radiotherapy Versus Liver Resection for Small Hepatocellular Carcinoma. *Int J Radiat Oncol Biol Phys*. 2017 Jul 1;98(3):639-646. doi: 10.1016/j.ijrobp.2017.02.095