

Clinical Policy: Stereotactic Body Radiation Therapy

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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) as an alternative to surgery;
 - 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
 - F. Low to intermediated risk localized prostate cancer.
 - E. High risk prostate cancer when combined with androgen deprivation therapy, when delivering longer courses of external beam radiation therapy would present a documented hardship;
 - F. Pancreatic adenocarcinoma:
 1. Locally advanced disease, without distant metastases; or
 2. Combination therapy not feasible; or
 3. Isolated local recurrence, respecting normal organ tolerance.
- 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

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- 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.
- I. Refractory epileptic seizures in children when the lesion is located where a conventional surgical approach is technically difficult or excessively risky.³⁷

III. 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)

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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}

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/extremely hypofractionated image-guided intensity-modulated radiation therapy (IMRT) regimens (6.5 Gy per fraction or greater) can be considered as an alternative to conventionally fractionated regimens in the treatment of prostate cancer at clinics with appropriate technology, physics, and clinical expertise. Longer follow-up and prospective multi-institutional data are required to evaluate longer-term results, especially because late toxicity theoretically could be worse in hypofractionated regimens compared to conventional fractionation (1.8 Gy-2.0 Gy).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 for the treatment of pancreatic adenocarcinoma should be delivered at an experienced high-volume center with technology that allows for image-guided radiation therapy or in a clinical trial.²⁵ Most recent guidelines from NCCN on the principles of radiation therapy note that data are limited to support radiation therapy recommendations for locally advanced disease. The guidelines include SBRT as an “option” in select patients with pancreatic adenocarcinoma with good performance status and locally advanced disease without systemic metastasis. Chemoradiation or SBRT may be also be an option in select patients who are not candidates for combination therapy, an option in disease progression when SBRT had not been previously given, and as an option for isolated local recurrence. SBRT should be avoided if direct invasion of the bowel or stomach is observed on imaging and/or endoscopy.²⁵

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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

There is currently insufficient evidence to recommend SBRT for treatment of head and neck cancers, however, it might be beneficial for palliation or for older adults. When using SBRT techniques in reirradiation, selection of patients who do not have circumferential carotid involvement is advised.³⁴ The best outcomes are seen in patients with smaller tumors and no skin involvement.³⁴

American Academy of Neurology

There is insufficient evidence to make recommendations regarding the use of gamma knife thalamotomy in the treatment of essential tremor. Per UpToDate, “Gamma knife thalamotomy has not generally been adopted for essential tremor due to concerns about delayed radiation side effects, including risk of radiation necrosis and a theoretical risk of secondary tumor formation.”³¹

Per UpToDate on seizures and epilepsy in children, “Stereotactic radiosurgery may be helpful for selected cases when the lesion is located where a conventional surgical approach is technically difficult or excessively risky. More information is needed on long-term outcome before wider application of this procedure.”³⁷

American Society for Radiation Oncology (ASTRO), the American Society of Clinical Oncology (ASCO), and the American Urological Association (AUA)

Per a recent new guideline on hypofractionated radiation therapy for localized prostate cancer from ASTRO, ASCO, and the AUA, “Based on high-quality evidence, strong consensus was reached for offering moderate hypofractionation across risk groups to patients choosing external beam radiation therapy. The task force reached a weaker consensus for ultrahypofractionated radiation therapy. Extremely hypofractionated radiation therapy, also known as ultrahypofractionation, SBRT or stereotactic ablative radiation therapy (SABR) may be offered for low and intermediate risk prostate cancer, but strongly encourages treatment of intermediate-risk patients on a clinical trial or multi-institutional registry. For high-risk disease, the panel does not suggest offering ultrahypofractionation outside of a trial or registry.”³³ Recommendations for ultrahypofractionation were graded by the panel as conditional, reflecting the limited base of current evidence on this approach. The guideline recommends large-scale randomized clinical trials and stresses the importance of shared decision making between clinicians and patients.³³

Coding Implications

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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
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 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 (may not be all inclusive)

ICD-10-CM Code	Description
C22.0-C22.9	Malignant neoplasm of liver and intrahepatic bile ducts
C25.0- C25.9	Malignant neoplasm of pancreas
C34.00-C34.92	Malignant neoplasm of bronchus and lung
C61	Malignant neoplasm of prostate
C70.0-C70.9	Malignant neoplasm of meninges

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ICD-10-CM Code	Description
C71.0-C71.9	Malignant neoplasm of brain
C72.0-C72.59	Malignant neoplasm of spinal cord, cranial nerves
C78.00-C78.02	Secondary malignant neoplasm of lung
C78.7	Secondary malignant neoplasm of liver and intrahepatic bile duct
C78.89	Secondary malignant neoplasm of other digestive organs
C79.31-C79.32	Secondary malignant neoplasm of brain and cerebral meninges
D18.02	Hemangioma of intracranial structures
D32.0-D32.9	Benign neoplasm of 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
D35.3	Benign neoplasm of craniopharyngeal duct
D35.4	Benign neoplasm of pineal gland
D42.0-D42.9	Neoplasm of uncertain behavior of meninges
D43.0-D43.9	Neoplasm of uncertain behavior of brain and central nervous system
D44.3	Neoplasm of uncertain behavior of pituitary gland
D44.4	Neoplasm of uncertain behavior of craniopharyngeal duct
D49.6	Neoplasm of unspecified behavior of brain
G40.011-G40.019	Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with simple partial seizures, intractable
G40.111-G40.119	Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with simple partial seizures, intractable
G40.211-G40.219	Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with complex partial seizures, intractable
G40.311-G40.319	Generalized idiopathic epilepsy and epileptic syndromes, intractable
G40.A11-G40.A19	Absence epileptic syndrome, intractable
G40.B11-G40.B19	Juvenile myoclonic epilepsy, intractable
G40.411-G40.419	Other generalized epilepsy and epileptic syndromes, intractable
G40.803-G40.804	Other epilepsy, intractable
G40.813-G40.814	Lennox-Gastaut syndrome, intractable
G40.823-G40.824	Epileptic spasms, intractable,
G40.911-G40.919	Epilepsy, unspecified, intractable
G50.0	Trigeminal neuralgia
Q28.2	Arteriovenous malformations of cerebral vessels

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ICD-10-CM Code	Description
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.	03/18	
Added low to intermediate risk localized prostate cancer to section I.as medically necessary. Updated background. Revised coding section, combining ICD 10 codes into applicable categories. References reviewed and updated.	2/19	03/19
Revised wording in I.A from “in patients who are not surgical candidates” to “as an alternative to surgery”; Added to section I. Indications for SBRT: Pancreatic cancer and high risk prostate cancer, when specific criteria are met; Added to section II- indication for SRS: Refractory epileptic seizures in children, when criterion is met. Updated background information regarding NCCN recommendations on pancreatic cancer. Added note that ICD 10 code list may not be all inclusive. Added the following ICD-10 code/code ranges: C25.0- C25.9, C78.89, G40.011-G40.019, G40.111-G40.119, G40.211-G40.219, G40.311-G40.319, G40.A11-G40.A19, G40.B11-G40.B19, G40.411-G40.419, G40.803-G40.804, G40.813-G40.814, G40.823-G40.824, and G40.911-G40.919. Internal and external specialist review.	10/2020	12/2020

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