

8.01.45 Intracavitary Balloon Catheter Brain Brachytherapy for Malignant Gliomas or Metastasis to the Brain			
Original Policy Date:	June 30, 2015	Effective Date:	September 1, 2024
Section:	8.0 Therapy	Page:	Page 1 of 14

Policy Statement

- I. Intracavitary balloon catheter brain brachytherapy is considered **investigational**, alone or as part of a multimodality treatment regimen, for **any** of the following:
 - A. Primary or recurrent malignant brain tumors
 - B. Metastasis to the brain from primary solid tumors outside the brain

In the event of an overturn or exception, See Policy Guidelines for [allowable codes/number of units](#).

NOTE: Refer to [Appendix A](#) to see the policy statement changes (if any) from the previous version.

Policy Guidelines

Coding

There are no CPT codes specific to implantation of this type of balloon catheter. It is possible that the provider may use the following CPT code:

- **64999:** Unlisted procedure, nervous system

Remote afterloading brachytherapy systems automatically administer a radioisotope directly to cancerous tissue, thereby minimizing the radiation dose to surrounding tissue and eliminating the radiation exposure to hospital staff. The amount of the radiation dose varies with the brachytherapy method chosen for treatment delivery: low-dose-rate (LDR) brachytherapy uses an implanted source that delivers a dose of 40 to 60 centigrays (cGy) per hour over several days; high-dose-rate (HDR) brachytherapy uses a traveling (stepping) source that delivers a dose greater than 100 cGy per minute for 5 to 30 minutes; pulsed-dose-rate (PDR) brachytherapy uses a cable-driven source delivering a dose of up to about 300 cGy per hour for 10 to 30 minutes, repeated over several days.

The administration of the radiation source would likely be coded using one of the CPT codes for radiation source application (77761-77763) or remote afterloading of high-dose brachytherapy (77770-77772).

- **77761:** Intracavitary radiation source application; simple
- **77762:** Intracavitary radiation source application; intermediate
- **77763:** Intracavitary radiation source application; complex
- **77770:** Remote afterloading high dose rate radionuclide interstitial or intracavitary brachytherapy, includes basic dosimetry, when performed; 1 channel
- **77771:** Remote afterloading high dose rate radionuclide interstitial or intracavitary brachytherapy, includes basic dosimetry, when performed; 2-12 channels
- **77772:** Remote afterloading high dose rate radionuclide interstitial or intracavitary brachytherapy, includes basic dosimetry, when performed; over 12 channels

There is a HCPCS code specific to the radiation solution used in this procedure:

- **A9527:** Iodine I-125, sodium iodide solution, therapeutic, per millicurie

Allowable Codes and Frequencies for Brachytherapy

Description	Code	Maximum per course of treatment	Notes
Clinical Treatment Planning	77261, 77262 or 77263	1	When used as standalone or with external beam, only one plan is allowed.
Simulation	77280, 77285, 77290	5	May not be billed with 77301
Verification Simulation	77280	5	May not be billed with 77301
Respiratory Motion Management	77293	0	Not needed for brachytherapy alone
3D CRT Plan	77295	1 per insertion, max 5	May not be billed with 77301 or with 77316/77317/77318
Brachytherapy Isodose Plan	77316, 77317 or 77318	1 per insertion, max 5	cannot be billed along with 77295
Special Radiation Physics Consult	77370	0	May allow x 1; documentation of medical necessity required
Special MD Consultation (Special Tx Procedure)	77470	1	May allow x 1; documentation of medical necessity required for more than 1 unit
Supervision, Handling, Loading of Radiation Source	77790	1	May not be billed with 77761, 77762, 77763, 77770, 77771, 77772 or 77778
Application of Radiation Sources: LDR Brachytherapy	77761, 77762, 77763, 77778	1	May not be billed with 77770, 77771, 77772
Application of Radiation Sources: HDR Brachytherapy High Dose Rate	77770, 77771, 77772	4	Only one delivery code allowed per day per course of therapy. May not be billed with 77761, 77762, 77763, 77778, 77790.
Electronic Brachytherapy, per fraction	0394T-0395T	0	Investigational for the treatment of skin lesions.
Placement of Radiotherapy Afterloading Catheters	19296, 19297, 19298	1	

See the [Codes table](#) for details.

Description

Intracavitary balloon catheter brain brachytherapy is an approach to localized radiotherapy using liquid I-125 delivered with an inflatable balloon catheter to treat malignant brain lesions.

Related Policies

- Radiation Oncology

Benefit Application

Benefit determinations should be based in all cases on the applicable contract language. To the extent there are any conflicts between these guidelines and the contract language, the contract language will control. Please refer to the member's contract benefits in effect at the time of service to determine coverage or non-coverage of these services as it applies to an individual member.

Some state or federal mandates (e.g., Federal Employee Program [FEP]) prohibits plans from denying Food and Drug Administration (FDA)-approved technologies as investigational. In these instances, plans may have to consider the coverage eligibility of FDA-approved technologies on the basis of medical necessity alone.

Regulatory Status

In 2001, the GliSite[®] Radiation Therapy System (GliSite[®] RTS; IsoRay Medical) was cleared for marketing by the U.S. Food and Drug Administration (FDA) through the 510(k) process (K003206). FDA determined that this device was substantially equivalent to separately marketed ventricular reservoirs and catheters, manual radionuclide applicator systems, and radionuclide sources.

In 2011, a modified GliSite[®] RTS was cleared for marketing by FDA through the 510(k) process (K111931). GliSite[®] RTS includes a catheter tray with a double balloon catheter and accessories used for implantation of an aqueous saline solution of molecularly bound radioactive iodine (sodium 3 [I-125] iodo-4-hydroxybenzenesulfonate; Iotrex[™]) as the radiation source; and an access tray with items used for afterloading and retrieving the radioactive material. One to 3 weeks after resection and balloon implantation, the Iotrex[™] solution is loaded through a subcutaneous port and left in for 3 to 6 days. Prescribed radiation doses are usually 40 to 60 gray measured at 0.5 to 1.0 cm from the balloon surface. This procedure has been performed on an inpatient basis.

In December 2013, CESITRX (Liquid Cesium131 solution) was cleared for marketing by FDA through the 510(k) process (K132996) for use with GliSite RTS.

In April 2016, IsoRay Medical terminated the supply, manufacture, and distribution of the GliSite RTS due to poor sales. Other intracavitary balloon brachytherapy systems have also been cleared for marketing by the FDA through the 510(k) process, such as the MammoSite (2004) and Contura (2008) Systems manufactured by Hologic for the treatment of breast cancer.³

FDA product code: KXK.

Rationale

Background Brain Tumors

Malignant Gliomas

Diffuse fibrillary astrocytoma is the most common glial brain tumor in adults. It is classified histologically into 3 grades: grade II astrocytoma, grade III anaplastic astrocytoma, and grade IV glioblastoma multiforme. Oligodendrogliomas are diffuse neoplasms closely related to diffuse fibrillary astrocytomas clinically and biologically. However, these tumors generally have better prognoses than diffuse astrocytomas, with mean survival times of 10 years versus 2 to 3 years. Also, oligodendrogliomas apparently are more chemosensitive than astrocytomas. The most aggressive and chemoresistant astrocytoma, glioblastoma multiforme has survival times of less than 2 years for most patients.

Treatment

Treatment of primary brain tumors begins with surgery with curative intent or optimal tumor debulking, usually followed by radiotherapy and/or chemotherapy. Survival after chemoradiotherapy largely depends on the extent of residual tumor after surgery. Therefore, tumors arising in the midline, basal ganglia, or corpus callosum or those arising in the eloquent speech or motor areas of the cortex have a particularly poor outcome, because they typically cannot be extensively resected.

Recurrence is common after surgery for malignant gliomas, even if followed by chemoradiotherapy because the tumors are usually diffusely infiltrating and develop resistance to chemotherapy; also, neurotoxicity limits cumulative doses of whole-brain radiation. Chemotherapy regimens for gliomas usually rely on nitrosourea alkylating agents (carmustine or lomustine), temozolomide, procarbazine, vincristine, and platinum-based agents. The most common regimen combines procarbazine, lomustine, vincristine, and single or multiagent therapy with temozolomide. A biodegradable polymer wafer impregnated with carmustine (Gliadel® Wafer; Guilford Pharmaceuticals) also can be implanted into the surgical cavity as an adjunct to surgery and radiation. It is indicated for newly diagnosed high-grade malignant glioma and for recurrent glioblastoma multiforme.

Brain Metastasis From Other Primary Malignancies

Intracranial metastases are a frequent occurrence seen at autopsy in 10% to 30% of deaths from cancer. Lung cancer is the most common source of brain metastasis (relative prevalence, 48%), followed by breast cancer (15%), unknown primary (12%), melanoma (9%), and colon cancer (5%).

Treatment

Treatment goals in these patients include local control of existing metastases, regional control to prevent the growth of undetected metastases, extending the duration of overall survival, and maintaining quality of life. Surgical resection followed by whole-brain radiotherapy (WBRT) is the mainstay of treatment for patients with 1 to 3 operable brain metastases and with adequate performance status and control of extracranial disease. Resection plus WBRT extends the duration of survival compared with biopsy plus WBRT. Although adding WBRT to resection does not increase the duration of overall survival, it reduces local and distant recurrence of brain metastases. Thus, WBRT decreases the incidence of death from neurologic causes and may help maintain an adequate quality of life, if the cumulative dose does not cause unacceptable neurotoxicity.

Intracavitary Balloon Catheter Brain Brachytherapy

Intracavitary balloon catheter brain brachytherapy is localized temporary high-dose radiotherapy in the brain that requires placement of an inflatable balloon catheter in the surgical cavity, before closing the craniotomy of a resection to remove or debulk a malignant brain mass. A radiation source is then placed in the balloon to expose surrounding brain tissue to radiation, either continuously or in a series of brief treatments. After the patient completes therapy, the radiation source is permanently removed, and the balloon catheter is surgically explanted.

Safety Considerations

Overall, adverse events with Gliasite do not differ greatly from those observed with other brain brachytherapy techniques; however, Adkison et al (2008) reported a case in which linens of a patient with the Gliasite implant were contaminated with radiation.¹ Recovery studies confirmed that systemic absorption is greater than anticipated. Adkison et al concluded that precaution with a Foley catheter should be taken in patients with urinary incontinence. Gerber et al (2007) reported cases of brain hemorrhage have, suggesting the need for careful coagulation control.²

Literature Review

Evidence reviews assess the clinical evidence to determine whether the use of a technology improves the net health outcome. Broadly defined, health outcomes are length of life, quality of life, and ability to function—including benefits and harms. Every clinical condition has specific outcomes that are important to patients and to managing the course of that condition. Validated outcome measures are necessary to ascertain whether a condition improves or worsens; and whether the magnitude of that change is clinically significant. The net health outcome is a balance of benefits and harms.

To assess whether the evidence is sufficient to draw conclusions about the net health outcome of a technology, 2 domains are examined: the relevance and the quality and credibility. To be relevant, studies must represent 1 or more intended clinical use of the technology in the intended population and compare an effective and appropriate alternative at a comparable intensity. For some

conditions, the alternative will be supportive care or surveillance. The quality and credibility of the evidence depend on study design and conduct, minimizing bias and confounding that can generate incorrect findings. The randomized controlled trial (RCT) is preferred to assess efficacy; however, in some circumstances, nonrandomized studies may be adequate. RCTs are rarely large enough or long enough to capture less common adverse events and long-term effects. Other types of studies can be used for these purposes and to assess generalizability to broader clinical populations and settings of clinical practice.

Because primary brain tumors and brain metastases from other tumors have poor prognoses and are treatment-resistant, nonrandomized comparative studies and uncontrolled studies may provide useful information on health outcomes.

Promotion of greater diversity and inclusion in clinical research of historically marginalized groups (e.g., People of Color [African-American, Asian, Black, Latino and Native American]; LGBTQIA (Lesbian, Gay, Bisexual, Transgender, Queer, Intersex, Asexual); Women; and People with Disabilities [Physical and Invisible]) allows policy populations to be more reflective of and findings more applicable to our diverse members. While we also strive to use inclusive language related to these groups in our policies, use of gender-specific nouns (e.g., women, men, sisters, etc.) will continue when reflective of language used in publications describing study populations.

Primary Newly Diagnosed or Recurrent Brain Tumors

Clinical Context and Therapy Purpose

The purpose of intracavitary balloon catheter brain brachytherapy in individuals who have primary brain tumors is to provide a treatment option that is an alternative to or an improvement on existing therapies.

The following PICO was used to select literature to inform this review.

Populations

The relevant population of interest is individuals with primary or recurrent brain tumors.

Interventions

The therapy being considered is intracavitary balloon catheter brain brachytherapy.

Comparators

The following therapies are currently being used: other forms of radiotherapy.

Outcomes

The general outcomes of interest are overall survival (OS), recurrence-free survival, and symptom reductions (e.g., headaches, seizures, behavioral changes).⁴ Generally, the 5-year adult survival rate for brain tumors is 76%.⁵ Individuals over the age of 40 years with malignant tumors have a 5-year survival of 21%, compared to 5-year survival of 90.3% for non-malignant tumors.

Study Selection Criteria

Methodologically credible studies were selected using the following principles:

- To assess efficacy outcomes, comparative controlled prospective trials were sought, with a preference for RCTs;
- In the absence of such trials, comparative observational studies were sought, with a preference for prospective studies.
- To assess long-term outcomes and adverse events, single-arm studies that capture longer periods of follow-up and/or larger populations were sought.
- Studies with duplicative or overlapping populations were excluded.

Malignant Gliomas and Astrocytoma Review of Evidence

No RCTs or other controlled studies were identified. All published studies are uncontrolled case series.

Tatter et al (2003) reported on a multicenter safety and feasibility study of the GliaSite Radiation Therapy System (RTS) device for recurrent high-grade gliomas (N=21; 15 with glioblastoma multiforme [GBM], 5 with anaplastic astrocytoma, 1 with anaplastic oligodendrogliomas).⁶ All patients received first-line therapy with resection and radiation, with or without systemic chemotherapy. Time from end of first-line therapy to repeated resection for recurrent disease was not reported. Although not a primary end point, median OS was 12.7 months (95% confidence interval [CI], 6.9 to 15.3 months), and a Kaplan-Meier curve showed the estimated OS rate at 1 year as just over 50%. Investigators reported no serious device-related adverse events during brachytherapy and no symptomatic radiation necrosis during follow-up.

Gabayan et al (2006) reported on a retrospective multi-institutional analysis of the GliaSite RTS device for recurrent high-grade gliomas (N=95; 80 with GBM, 9 with anaplastic astrocytoma, 4 with anaplastic oligodendrogliomas, 1 each with a mixed anaplastic tumor or gliosarcoma).⁷ All patients received external-beam radiotherapy (EBRT) after initial resection, and 55 (58%) also received systemic chemotherapy. Time from end of front-line therapy to repeated resection for recurrent disease was not reported. Fifteen (16%) patients who had previously been treated with EBRT following maximal debulking surgery were treated with GliaSite RTS (average dose, 60 gray [Gy]) on tumor recurrence. Median OS from the time of GliaSite placement was 9.1 months (95% CI, 7.8 to 10.4 months), and the OS rate at 1 year was 31.1% (95% CI, 21.2% to 41.0%). Only 2 patients experienced Radiation Therapy Oncology Group grade 3 toxicity attributable to radiation, and none experienced grade 4 or 5 toxicity. However, 10 adverse events were attributed to surgery. The authors concluded that survival benefit was modest and that, similar to previous feasibility studies, these data were inconclusive. The retrospective analysis on GliaSite⁷ did not report important prognostic factors available from the Gliadel randomized trial (e.g., median interval from the first operation; cumulative radiation dose and proportion given whole-brain radiotherapy [WBRT] vs. local radiation vs. both in first-line therapy, and completeness of the second resections). Authors found it challenging to assess survival value from these studies without better comparative evidence on demonstrably similar patient groups, preferably from a randomized comparative trial.

Wernicke et al (2010) reported on a single-institution, dose-escalation study investigating the safety and feasibility of GliaSite after surgical resection of localized newly diagnosed and recurrent brain tumors.^{8,9} The balloon was implanted during surgery in 10 consecutive patients; then 2 to 3 weeks later, an aqueous solution of iodine 125 was introduced for times ranging from 68 to 120 hours. The median total dose was 52 Gy. Median survival for this cohort was 14 months. There were no reports of Radiation Therapy Oncology Group grade 3 or 4 toxicities. Similarly to the other studies cited, results from this trial suggested that the GliaSite RTS is relatively safe and well-tolerated in patients with localized brain tumors.

Gobitti et al (2011) reported on 15 patients treated with GliaSite brachytherapy after surgical resection of recurrent grade 3 or 4 gliomas (10 with GBM, 4 anaplastic astrocytomas, 1 anaplastic xanthoastrocytoma).¹⁰ Patients were followed for 1 to 30 months. Only 2 patients survived to 30-month follow-up. Eleven patients experienced local tumor recurrence. After GliaSite brachytherapy, median OS was 13 months, and median disease-free survival was 7 months. Late radiation necrosis was experienced by 3 patients; 2 subsequently died of further complications. One patient had hemiparesis and dysphagia, which resolved over 6 months. The authors concluded that reintervention followed by GliaSite brachytherapy should not be offered as a standard treatment for recurrent high-grade glioma, because of the high rate of late complications, treatment-related deaths, and high treatment costs.

No published studies using liquid cesium 131 for this indication were identified.

Section Summary: Malignant Gliomas and Astrocytoma

The evidence for the use of intracavitary balloon brain brachytherapy for malignant gliomas and astrocytomas consists of early-phase feasibility and dose-ranging studies, a small case series, and a retrospective review. There are no published RCTs. The evidence does not support conclusions on the effects of the technology on health outcomes.

Glioblastoma Multiforme**Review of Evidence**

No RCTs or other controlled studies were identified. All published studies were uncontrolled case series.

Johannesen et al (1999) reported on 44 newly diagnosed GBM patients implanted with intracavitary balloon catheters at resection.¹¹ Two to 3 days after surgery, high-dose-rate iridium 192 sources were inserted twice daily for 15 minutes over 5 to 6 days, using remote after loading devices designed and fabricated by the investigators. Cumulative radiation doses were 60 (n=33) or 72 Gy (n=11). Median survival was 11.7 months (range, 2.7 to 50.9 months) for all patients, 12.8 months for those treated with 60 Gy and 9.9 months for those treated with 72 Gy. The OS rate at 1 year was 46%. Relapses occurred in 89% of patients at a median follow-up of 8.3 months after treatment (range, 1.2 to 34.7 months). These outcomes are similar to those of conventional WBRT after resection, although investigators emphasized the shorter treatment time (1 week vs. 5 to 6 weeks) with balloon catheter brachytherapy. While claiming that hospital stays were shorter (median, 21 days) and quality of life over the first 6 months was better than after conventional WBRT, the authors did not report data to support these claims.

In a multicenter, retrospective study, Welsh et al (2007) compiled data from 20 patients with GBM at 8 centers (median age, 59 years; median Karnofsky Performance Status score, 89).¹² Following maximal tumor debulking, patients were treated with GliaSite (median dose, 60 Gy) before EBRT (median dose, 110 Gy). In this cohort, average survival was 11.4 months (range, 4 to 29 months), 4 months longer than historical controls (95% CI, 0.23 to 4.9 months). Radiation Therapy Oncology Group grade 3 central nervous system toxicity was observed in 3 (14%) patients. It is noteworthy that 50% of treatment failures had balloons placed 2 cm or more from the margin of the tumor. While this study might suggest that administration of increased doses (up to 100 Gy) using GliaSite is feasible and relatively well-tolerated, the authors acknowledged that putative survival advantage must be interpreted cautiously. Additional studies using GliaSite with EBRT following surgery for newly diagnosed GBM would be required to assess safety and efficacy adequately.

In a study (N=24) on recurrent GBM performed at university medical center, Chan et al (2005) reported results to be inconclusive.¹³ Front-line therapy included surgery followed by EBRT. Time from primary resection (or from the end of primary treatment) to recurrence was not reported. Median OS was 23.3 months (range, 9.3 to 64.1 months) from diagnosis of the primary tumor, and 9.1 months (range, 1.3 to 23.6 months) from GliaSite RTS treatment. Kaplan-Meier analyses showed a 1-year OS rate to be approximately 33%. GliaSite was relatively well-tolerated in this cohort with few serious adverse events. Acute adverse effects were reportedly mild: 1 patient experienced mild nausea and vomiting, and 10 experienced mild-to-moderate headaches. Late complications included a case of global aphasia and 2 incidents of symptomatic necrosis.

Waters et al (2013) retrospectively reviewed 11 patients with newly diagnosed GBM who received brain brachytherapy 2 to 3 days after surgical resection before EBRT and temozolomide.¹⁴ Brachytherapy was delivered at 45 to 60 Gy with GliaSite in 9 patients and with MammoSite in 2 patients. While progression-free survival trended toward improvement at 6 months, OS did not differ from historical controls.

No published studies using liquid cesium 131 for this indication were identified.

Section Summary: Glioblastoma Multiforme

The evidence for the use of intracavitary balloon brain brachytherapy to treat GBM is limited to case series.

Brain Metastases from Other Primary Solid Malignancies**Clinical Context and Therapy Purpose**

The purpose of intracavitary balloon catheter brain brachytherapy in individuals who have metastases to the brain from other tumors is to provide a treatment option that is an alternative to or an improvement on existing therapies.

The following PICO was used to select literature to inform this review.

Populations

The relevant population of interest is individuals with metastases to the brain from other tumors (e.g., non-small-cell lung cancer, renal cell carcinoma, melanoma).

Interventions

The therapy being considered is intracavitary balloon catheter brain brachytherapy.

Comparators

The following therapies are currently being used: other forms of radiotherapy.

Outcomes

The general outcomes of interest are OS, recurrence-free survival, and symptom reductions (e.g., headaches, seizures, cognitive changes). Given the prognosis of this patient population, follow-up to 5 years is rare (<35%).

Study Selection Criteria

Methodologically credible studies were selected using the following principles:

- To assess efficacy outcomes, comparative controlled prospective trials were sought, with a preference for RCTs;
- In the absence of such trials, comparative observational studies were sought, with a preference for prospective studies.
- To assess long-term outcomes and adverse events, single-arm studies that capture longer periods of follow-up and/or larger populations were sought.
- Studies with duplicative or overlapping populations were excluded.

Review of Evidence**Nonrandomized Studies**

No RCTs were identified. However, Rogers et al (2006) published a multicenter, nonrandomized, noncomparative study including 71 patients with 1 to 3 brain metastases from a solid tumor of distant origin.¹⁵ Enrolled patients received placement of the GliaSite balloon followed by installation of aqueous iodine-125 radiotherapy solution with the prescribed total dose for each patient of 60 Gy at a 1-cm depth to be delivered at a rate of 40 to 60 centigray per hour. The primary study end point was the 1-year local control rate. Outcomes were analyzed without an intention-to-treat model. Primary malignancies included non-small-cell lung (54%) and gastrointestinal tract (13%) cancers, melanoma (13%), renal carcinoma (6%), and others (15%). While most patients (57%) had only brain metastases, many (43%) also had extracranial metastases. Prior therapies varied widely and included no treatment (22%), surgery (31%), surgery plus radiotherapy (33%), or surgery plus chemotherapy followed by radiotherapy (24%). Estimated local control at 1 year was 79%, and median duration of local control exceeded 16.5 months. Median OS was 10 months (95% CI, 7.8 to 15 months), OS rate at 1 year was 40%, and median duration of functional independence was 10 months (95% CI, 7.3 to 20.8 months). Symptomatic imaging changes led to repeated surgeries in 13 patients, 9

of whom had radiation necrosis, 2 had mixed tumor and necrosis, and 2 had tumor recurrence only. Nine grade 3 and 1 grade 4 toxicities were reported in the treated population.

Investigators indirectly compared the local control rate in the GliaSite-treated population: 79% with historical data showing 80% to 90% local control after resection plus WBRT and only 40% after resection only. However, an accompanying editorial cautioned that the rate of new metastases elsewhere in the brain was 50% by 1 year after treatment and attributed this to the omission of WBRT.¹⁶ The editorial also emphasized the need for direct comparative evidence to determine whether neurocognitive function and quality of life are adequately maintained for longer durations with initially focal treatment and WBRT at recurrence or with focal treatment immediately combined with WBRT.

No published studies using liquid cesium 131 for this indication were identified.

Section Summary: Brain Metastases from Other Primary Solid Tumors

The evidence for the use of intracavitary balloon brain brachytherapy to treat brain metastases from other tumors is limited to a nonrandomized, single-arm study. The relevance of outcomes indirectly demonstrating local control of 79% at 1 year is confounded by the varying radiosensitivity of the tumors, and OS was impacted by the rate of extracranial metastatic disease.

Supplemental Information

The purpose of the following information is to provide reference material. Inclusion does not imply endorsement or alignment with the evidence review conclusions.

Practice Guidelines and Position Statements

Guidelines or position statements will be considered for inclusion in 'Supplemental Information' if they were issued by, or jointly by, a US professional society, an international society with US representation, or National Institute for Health and Care Excellence (NICE). Priority will be given to guidelines that are informed by a systematic review, include strength of evidence ratings, and include a description of management of conflict of interest.

National Comprehensive Cancer Network

The National Comprehensive Cancer Network guidelines (v.1.2024) for central nervous system cancers does not mention brachytherapy as 1 of several treatment options used by radiation oncologists.¹⁷

Congress of Neurological Surgeons

In 2019, the Congress of Neurological Surgeons published updated evidence-based guidelines on the role of emerging and investigational therapies for the treatment of adults with metastatic brain tumors. The guidelines indicate that there is insufficient evidence to support the routine use of existing local therapies such as brachytherapy aside from their use in approved clinical trials.¹⁸

U.S. Preventive Services Task Force Recommendations

Not applicable.

Medicare National Coverage

There is no national coverage determination. In the absence of a national coverage determination, coverage decisions are left to the discretion of local Medicare carriers.

Ongoing and Unpublished Clinical Trials

A search of ClinicalTrials.gov in June 2024 did not identify any ongoing or unpublished trials that would likely influence this review.

References

1. Adkison JB, Thomadsen B, Howard SP. Systemic iodine 125 activity after GliaSite brachytherapy: safety considerations. *Brachytherapy*. 2008; 7(1): 43-6. PMID 18201938
2. Gerber DE, Grossman SA, Chan TA, et al. Intracranial hemorrhage during GliaSite RTS manipulation in an anticoagulated patient. *J Radiother Pract*. 2007; 6: 53-57. PMID 19173012
3. IsoRay, Inc. Form 8-K 2016. SEC EDGAR. April 6, 2016; https://www.sec.gov/Archives/edgar/data/728387/000114420416093915/v436817_8k.htm. Accessed June 6, 2024.
4. Perkins A, Liu G. Primary Brain Tumors in Adults: Diagnosis and Treatment. *Am Fam Physician*. Feb 01 2016; 93(3): 211-7. PMID 26926614
5. National Brain Tumor Society. Quick Brain Tumor Facts. n.d.; <http://braintumor.org/brain-tumor-information/brain-tumor-facts/>. Accessed June 6, 2024.
6. Tatter SB, Shaw EG, Rosenblum ML, et al. An inflatable balloon catheter and liquid 125I radiation source (GliaSite Radiation Therapy System) for treatment of recurrent malignant glioma: multicenter safety and feasibility trial. *J Neurosurg*. Aug 2003; 99(2): 297-303. PMID 12924704
7. Gabayan AJ, Green SB, Sanan A, et al. GliaSite brachytherapy for treatment of recurrent malignant gliomas: a retrospective multi-institutional analysis. *Neurosurgery*. Apr 2006; 58(4): 701-9; discussion 701-9. PMID 16575334
8. Wernicke AG, Sherr DL, Schwartz TH, et al. The role of dose escalation with intracavitary brachytherapy in the treatment of localized CNS malignancies: outcomes and toxicities of a prospective study. *Brachytherapy*. 2010; 9(1): 91-9. PMID 19850535
9. Wernicke AG, Sherr DL, Schwartz TH, et al. Feasibility and safety of GliaSite brachytherapy in treatment of CNS tumors following neurosurgical resection. *J Cancer Res Ther*. 2010; 6(1): 65-74. PMID 20479550
10. Gobitti C, Borsatti E, Arcicasa M, et al. Treatment of recurrent high-grade gliomas with GliaSite brachytherapy: a prospective mono-institutional Italian experience. *Tumori*. 2011; 97(5): 614-9. PMID 22158493
11. Johannesen TB, Watne K, Lote K, et al. Intracavity fractionated balloon brachytherapy in glioblastoma. *Acta Neurochir (Wien)*. 1999; 141(2): 127-33. PMID 10189493
12. Welsh J, Sanan A, Gabayan AJ, et al. GliaSite brachytherapy boost as part of initial treatment of glioblastoma multiforme: a retrospective multi-institutional pilot study. *Int J Radiat Oncol Biol Phys*. May 01 2007; 68(1): 159-65. PMID 17331666
13. Chan TA, Weingart JD, Parisi M, et al. Treatment of recurrent glioblastoma multiforme with GliaSite brachytherapy. *Int J Radiat Oncol Biol Phys*. Jul 15 2005; 62(4): 1133-9. PMID 15990019
14. Waters JD, Rose B, Gonda DD, et al. Immediate post-operative brachytherapy prior to irradiation and temozolomide for newly diagnosed glioblastoma. *J Neurooncol*. Jul 2013; 113(3): 467-77. PMID 23673513
15. Rogers LR, Rock JP, Sills AK, et al. Results of a phase II trial of the GliaSite radiation therapy system for the treatment of newly diagnosed, resected single brain metastases. *J Neurosurg*. Sep 2006; 105(3): 375-84. PMID 16961129
16. Barker FG. Brain metastasis. *J Neurosurg*. Sep 2006; 105(3): 371-2; discussion 372-4. PMID 16961128
17. National Comprehensive Cancer Network (NCCN). NCCN Clinical Practice Guidelines in Oncology: Central Nervous System Cancers. Version 1.2024. https://www.nccn.org/professionals/physician_gls/pdf/cns.pdf. Accessed June 6, 2024.
18. Elder JB, Nahed BV, Linskey ME, et al. Congress of Neurological Surgeons Systematic Review and Evidence-Based Guidelines on the Role of Emerging and Investigational Therapies for the Treatment of Adults With Metastatic Brain Tumors. *Neurosurgery*. Mar 01 2019; 84(3): E201-E203. PMID 30629215

Documentation for Clinical Review

Please provide the following documentation:

- (click here >>>) [Radiation Oncology – Prior Authorization fax form](#)
- (click here >>>) [Radiation Oncology – Post Service fax form](#)

Coding

This Policy relates only to the services or supplies described herein. Benefits may vary according to product design; therefore, contract language should be reviewed before applying the terms of the Policy.

The following codes are included below for informational purposes. Inclusion or exclusion of a code(s) does not constitute or imply member coverage or provider reimbursement policy. Policy Statements are intended to provide member coverage information and may include the use of some codes for clarity. The Policy Guidelines section may also provide additional information for how to interpret the Policy Statements and to provide coding guidance in some cases.

Type	Code	Description
CPT®	64999	Unlisted procedure, nervous system
	77761	Intracavitary radiation source application; simple
	77762	Intracavitary radiation source application; intermediate
	77763	Intracavitary radiation source application; complex
	77770	Remote afterloading high dose rate radionuclide interstitial or intracavitary brachytherapy, includes basic dosimetry, when performed; 1 channel
	77771	Remote afterloading high dose rate radionuclide interstitial or intracavitary brachytherapy, includes basic dosimetry, when performed; 2-12 channels
	77772	Remote afterloading high dose rate radionuclide interstitial or intracavitary brachytherapy, includes basic dosimetry, when performed; over 12 channels
HCPCS	A9527	Iodine I-125, sodium iodide solution, therapeutic, per millicurie
	C2644	Brachytherapy source, cesium-131 chloride solution, per millicurie

Policy History

This section provides a chronological history of the activities, updates and changes that have occurred with this Medical Policy.

Effective Date	Action
06/30/2015	BCBSA Medical Policy adoption
07/31/2015	Coding update
01/01/2016	Coding update
04/01/2017	Policy revision without position change
10/01/2017	Policy revision without position change
09/01/2018	Policy revision without position change
10/01/2019	Policy revision without position change
06/01/2020	Administrative update. Policy statement, guidelines and literature updated.
11/20/2020	Annual review. No change to policy statement. Literature review updated.
08/01/2021	Annual review. Policy statement and guidelines updated.

Effective Date	Action
12/01/2021	Administrative update. No change to policy statement. Policy guidelines and literature updated.
08/01/2022	Annual review. No change to policy statement.
09/01/2022	Administrative update. No change to policy statement. Literature review updated.
09/01/2023	Annual review. No change to policy statement. Literature review updated.
09/01/2024	Annual review. No change to policy statement. Literature review updated.

Definitions of Decision Determinations

Medically Necessary: Services that are Medically Necessary include only those which have been established as safe and effective, are furnished under generally accepted professional standards to treat illness, injury or medical condition, and which, as determined by Blue Shield, are: (a) consistent with Blue Shield medical policy; (b) consistent with the symptoms or diagnosis; (c) not furnished primarily for the convenience of the patient, the attending Physician or other provider; (d) furnished at the most appropriate level which can be provided safely and effectively to the patient; and (e) not more costly than an alternative service or sequence of services at least as likely to produce equivalent therapeutic or diagnostic results as to the diagnosis or treatment of the Member's illness, injury, or disease.

Investigational/Experimental: A treatment, procedure, or drug is investigational when it has not been recognized as safe and effective for use in treating the particular condition in accordance with generally accepted professional medical standards. This includes services where approval by the federal or state governmental is required prior to use, but has not yet been granted.

Split Evaluation: Blue Shield of California/Blue Shield of California Life & Health Insurance Company (Blue Shield) policy review can result in a split evaluation, where a treatment, procedure, or drug will be considered to be investigational for certain indications or conditions, but will be deemed safe and effective for other indications or conditions, and therefore potentially medically necessary in those instances.

Prior Authorization Requirements and Feedback (as applicable to your plan)

Within five days before the actual date of service, the provider must confirm with Blue Shield that the member's health plan coverage is still in effect. Blue Shield reserves the right to revoke an authorization prior to services being rendered based on cancellation of the member's eligibility. Final determination of benefits will be made after review of the claim for limitations or exclusions.

Questions regarding the applicability of this policy should be directed to the Prior Authorization Department at (800) 541-6652, or the Transplant Case Management Department at (800) 637-2066 ext. 3507708 or visit the provider portal at www.blueshieldca.com/provider.

We are interested in receiving feedback relative to developing, adopting, and reviewing criteria for medical policy. Any licensed practitioner who is contracted with Blue Shield of California or Blue Shield of California Promise Health Plan is welcome to provide comments, suggestions, or concerns. Our internal policy committees will receive and take your comments into consideration.

For utilization and medical policy feedback, please send comments to: MedPolicy@blueshieldca.com

Disclaimer: This medical policy is a guide in evaluating the medical necessity of a particular service or treatment. Blue Shield of California may consider published peer-reviewed scientific literature, national guidelines, and local standards of practice in developing its medical policy. Federal and state law, as well as contract language,

8.01.45 Intracavitary Balloon Catheter Brain Brachytherapy for Malignant Gliomas or Metastasis to the Brain

Page 13 of 14

including definitions and specific contract provisions/exclusions, take precedence over medical policy and must be considered first in determining covered services. Member contracts may differ in their benefits. Blue Shield reserves the right to review and update policies as appropriate.

Appendix A

POLICY STATEMENT (No changes)	
BEFORE	AFTER
<p>Intracavitary Balloon Catheter Brain Brachytherapy for Malignant Gliomas or Metastasis to the Brain 8.01.45</p> <p>Policy Statement:</p> <ul style="list-style-type: none"> I. Intracavitary balloon catheter brain brachytherapy is considered investigational, alone or as part of a multimodality treatment regimen, for any of the following: <ul style="list-style-type: none"> A. Primary or recurrent malignant brain tumors B. Metastasis to the brain from primary solid tumors outside the brain <p>In the event of an overturn or exception, See Policy Guidelines for allowable codes/number of units.</p>	<p>Intracavitary Balloon Catheter Brain Brachytherapy for Malignant Gliomas or Metastasis to the Brain 8.01.45</p> <p>Policy Statement:</p> <ul style="list-style-type: none"> I. Intracavitary balloon catheter brain brachytherapy is considered investigational, alone or as part of a multimodality treatment regimen, for any of the following: <ul style="list-style-type: none"> A. Primary or recurrent malignant brain tumors B. Metastasis to the brain from primary solid tumors outside the brain <p>In the event of an overturn or exception, See Policy Guidelines for allowable codes/number of units.</p>