



Radioembolization for Primary and Metastatic Tumors of the Liver

Policy # 00110

Original Effective Date: 02/23/2004

Current Effective Date: 05/13/2024

Applies to all products administered or underwritten by Blue Cross and Blue Shield of Louisiana and its subsidiary, HMO Louisiana, Inc. (collectively referred to as the “Company”), unless otherwise provided in the applicable contract. Medical technology is constantly evolving, and we reserve the right to review and update Medical Policy periodically.

Note: Microwave Tumor Ablation is addressed separately in medical policy 00569.

Note: Cryosurgical Ablation of Primary or Metastatic Liver Tumors is addressed separately in medical policy 00220.

Note: Radiofrequency Ablation of Primary or Metastatic Liver Tumors is addressed separately in medical policy 00182.

Note: Transcatheter Arterial Chemoembolization to Treat Primary or Metastatic Liver Malignancies is addressed separately in medical policy 00227.

When Services Are Eligible for Coverage

Coverage for eligible medical treatments or procedures, drugs, devices or biological products may be provided only if:

- *Benefits are available in the member’s contract/certificate, and*
- *Medical necessity criteria and guidelines are met.*

Based on review of available data, the Company may consider the use of radioembolization (RE) to treat primary hepatocellular carcinoma (HCC) that is unresectable and limited to the liver to be **eligible for coverage**** (see Policy Guidelines section).

Based on review of available data, the Company may consider the use of radioembolization (RE) in primary hepatocellular carcinoma (HCC) as a bridge to liver transplantation to be **eligible for coverage.****

©2024 Blue Cross and Blue Shield of Louisiana

Blue Cross and Blue Shield of Louisiana is an independent licensee of the Blue Cross and Blue Shield Association and incorporated as Louisiana Health Service & Indemnity Company.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without permission from Blue Cross and Blue Shield of Louisiana.



Louisiana

Radioembolization for Primary and Metastatic Tumors of the Liver

Policy # 00110

Original Effective Date: 02/23/2004

Current Effective Date: 05/13/2024

Based on review of available data, the Company may consider radioembolization (RE) to treat primary intrahepatic cholangiocarcinoma (ICC) in individuals with unresectable tumors to be **eligible for coverage.****

Based on review of available data, the Company may consider the use of radioembolization (RE) to treat hepatic metastases from neuroendocrine tumors (carcinoid and noncarcinoid) with diffuse and symptomatic disease when systemic therapy has failed to control symptoms to be **eligible for coverage.****

Based on review of available data, the Company may consider the use of radioembolization (RE) to treat unresectable hepatic metastases from colorectal carcinoma (CRC), melanoma (ocular or cutaneous), or breast cancer that are both progressive and diffuse, in individuals with liver-dominant disease who are refractory to chemotherapy or are not candidates for chemotherapy or other systemic therapies to be **eligible for coverage.****

When Services Are Considered Investigational

Coverage is not available for investigational medical treatments or procedures, drugs, devices or biological products.

Based on review of available data, the Company considers radioembolization for all other hepatic metastases except as noted above to be **investigational.***

Based on review of available data, the Company considers radioembolization (RE) for all other indications not described as above to be **investigational.***

Policy Guidelines

In general, radioembolization is used for unresectable hepatocellular carcinoma that is greater than 3 cm.

There is little information on the safety or efficacy of repeated radioembolization treatments or on the number of treatments that should be administered.

©2024 Blue Cross and Blue Shield of Louisiana

Blue Cross and Blue Shield of Louisiana is an independent licensee of the Blue Cross and Blue Shield Association and incorporated as Louisiana Health Service & Indemnity Company.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without permission from Blue Cross and Blue Shield of Louisiana.



Radioembolization for Primary and Metastatic Tumors of the Liver

Policy # 00110

Original Effective Date: 02/23/2004

Current Effective Date: 05/13/2024

Radioembolization should be reserved for individuals with adequate functional status (Eastern Cooperative Oncology Group Performance Status 0-2), adequate liver function and reserve, Child-Pugh class A or B, and liver-dominant metastases.

Symptomatic disease from metastatic neuroendocrine tumors refers to symptoms related to excess hormone production.

Background/Overview

Treatments for Hepatic and Neuroendocrine Tumors

The use of external-beam radiotherapy and the application of more advanced radiotherapy approaches (eg, intensity-modulated radiotherapy) may be of limited use in individuals with multiple diffuse lesions due to the low tolerance of the normal liver to radiation compared with the higher doses of radiation needed to kill the tumor.

Various nonsurgical ablative techniques have been investigated that seek to cure or palliate unresectable hepatic tumors by improving locoregional control. These techniques rely on extreme temperature changes (cryosurgery or radiofrequency ablation), particle and wave physics (microwave or laser ablation), or arterial embolization therapy including chemoembolization, bland embolization, or radioembolization.

Radioembolization

Radioembolization (referred to as selective internal radiotherapy in older literature) delivers small beads (microspheres) impregnated with yttrium-90 (Y90) intra-arterially via the hepatic artery. The microspheres, which become permanently embedded, are delivered to tumors preferentially because the hepatic circulation is uniquely organized, whereby tumors greater than 0.5 cm rely on the hepatic artery for blood supply while the normal liver is primarily perfused via the portal vein. Y90 is a pure beta-emitter with a relatively limited effective range and a short half-life that helps focus the radiation and minimize its spread. Candidates for radioembolization are initially examined by hepatic angiogram to identify and map the hepatic arterial system. At that time, a mixture of technetium 99-labeled albumin particles are delivered via the hepatic artery to simulate microspheres. Single-photon emission computed tomography is used to detect possible shunting of the albumin particles into the gastrointestinal or pulmonary vasculature.

©2024 Blue Cross and Blue Shield of Louisiana

Blue Cross and Blue Shield of Louisiana is an independent licensee of the Blue Cross and Blue Shield Association and incorporated as Louisiana Health Service & Indemnity Company.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without permission from Blue Cross and Blue Shield of Louisiana.



Radioembolization for Primary and Metastatic Tumors of the Liver

Policy # 00110

Original Effective Date: 02/23/2004

Current Effective Date: 05/13/2024

Currently, 2 commercial forms of Y90 microspheres are available: a glass sphere (TheraSphere) and a resin sphere (SIR-Spheres). Noncommercial forms are mostly used outside the U.S. While the commercial products use the same radioisotope (Y90) and have the same target dose (100 gray), they differ in microsphere size profile, base material (ie, resin vs glass), and size of commercially available doses. The physical characteristics of the active and inactive ingredients affect the flow of microspheres during injection, their retention at the tumor site, spread outside the therapeutic target region, and dosimetry calculations. The U.S. Food and Drug Administration (FDA) granted premarket approval of SIR-Spheres for use in combination with 5-fluorouridine chemotherapy by hepatic arterial infusion to treat unresectable hepatic metastases from colorectal cancer. In contrast, TheraSphere's glass sphere was approved under a humanitarian device exemption for use as monotherapy to treat unresectable hepatocellular carcinoma. In 2007, this humanitarian device exemption was expanded to include individuals with hepatocellular carcinoma who have partial or branch portal vein thrombosis. For these reasons, results obtained with a product do not necessarily apply to another commercial (or non-commercial) products (see Regulatory Status section).

FDA or Other Governmental Regulatory Approval

U.S. Food and Drug Administration (FDA)

Currently, 2 forms of Y90 microspheres have been approved by the FDA.

In 1999, TheraSphere^{®†} (Boston Scientific; previously manufactured by Nordion, under license by BTG International), a glass sphere system, was approved by the FDA through the humanitarian drug exemption process for radiotherapy or as a neoadjuvant treatment to surgery or transplantation in individuals with unresectable hepatocellular carcinoma who can have placement of appropriately positioned hepatic arterial catheters (H980006).

On March 17, 2021, TheraSphere received approval through the premarket approval process for use as selective internal radiation therapy (SIRT) for local tumor control of solitary tumors (1 to 8 cm in diameter), in individuals with unresectable hepatocellular carcinoma, Child-Pugh Score A cirrhosis, well-compensated liver function, no macrovascular invasion, and good performance status (P200029).

©2024 Blue Cross and Blue Shield of Louisiana

Blue Cross and Blue Shield of Louisiana is an independent licensee of the Blue Cross and Blue Shield Association and incorporated as Louisiana Health Service & Indemnity Company.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without permission from Blue Cross and Blue Shield of Louisiana.



Radioembolization for Primary and Metastatic Tumors of the Liver

Policy # 00110

Original Effective Date: 02/23/2004

Current Effective Date: 05/13/2024

In 2002, SIR-Spheres^{®†} (Sirtex Medical), a resin sphere system, was approved by the FDA through the premarket approval process for the treatment of inoperable colorectal cancer metastatic to the liver (P990065).

FDA product code: NAW.

Rationale/Source

This medical policy was developed through consideration of peer-reviewed medical literature generally recognized by the relevant medical community, U.S. Food and Drug Administration approval status, nationally accepted standards of medical practice and accepted standards of medical practice in this community, technology evaluation centers, reference to federal regulations, other plan medical policies, and accredited national guidelines.

Radioembolization (RE), also referred to as selective internal radiotherapy, delivers small beads (microspheres) impregnated with yttrium 90 intra-arterially via the hepatic artery. The microspheres, which become permanently embedded, are delivered to tumors preferentially because the hepatic circulation is uniquely organized, whereby tumors greater than 0.5 cm rely on the hepatic artery for blood supply while the normal liver is primarily perfused via the portal vein. Radioembolization has been proposed as a therapy for multiple types of primary and metastatic liver tumors.

Summary of Evidence

For individuals who have unresectable hepatocellular carcinoma (HCC) who receive radioembolization (RE) or RE with a liver transplant, the evidence includes primarily retrospective and prospective nonrandomized studies, with limited evidence from randomized controlled trials (RCTs). Relevant outcomes are overall survival (OS), functional outcomes, quality of life, and treatment-related morbidity. Nonrandomized studies have suggested that RE has high response rates compared with historical controls. Two small pilot RCTs have compared RE with alternative therapies for HCC, including transarterial chemoembolization and transarterial chemoembolization with drug-eluting beads. Both trials reported similar outcomes for RE compared with alternatives. Evidence from nonrandomized studies has demonstrated that RE can permit successful liver transplantation in certain individuals. The evidence is sufficient to determine that the technology results in an improvement in the net health outcome.

©2024 Blue Cross and Blue Shield of Louisiana

Blue Cross and Blue Shield of Louisiana is an independent licensee of the Blue Cross and Blue Shield Association and incorporated as Louisiana Health Service & Indemnity Company.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without permission from Blue Cross and Blue Shield of Louisiana.



Radioembolization for Primary and Metastatic Tumors of the Liver

Policy # 00110

Original Effective Date: 02/23/2004

Current Effective Date: 05/13/2024

For individuals who have unresectable intrahepatic cholangiocarcinoma (ICC) who receive RE, the evidence includes phase 2 studies and case series. Relevant outcomes are OS, functional outcomes, quality of life, and treatment-related morbidity. Comparisons of these case series to case series of alternative treatments have suggested that RE for primary ICC has response rates similar to those seen with standard chemotherapy. Due to high study heterogeneity, it is difficult to identify individuals that are most likely to benefit from treatment. A phase 2 study of RE with chemotherapy in the first-line setting reported a response rate of 39% and a disease control rate of 98%. The efficacy of RE in the neoadjuvant setting is being evaluated in an ongoing follow-up RCT. Another phase 2 study evaluating RE with or without subsequent chemotherapy in individuals without prior treatment with chemotherapy or radiation found overall response rates of 25% and 16.7% in those who received RE with and without chemotherapy, respectively; the disease control rates were 75% and 58.3% amongst those who received RE with and without chemotherapy, respectively. However, at this time, the evidence is not yet sufficiently robust to draw definitive conclusions about treatment efficacy. The evidence is insufficient to determine that the technology results in an improvement in the net health outcome.

For individuals who have unresectable neuroendocrine tumors who receive RE, the evidence includes an open-label phase 2 study, retrospective reviews, and case series, some of which have compared RE with other transarterial liver-directed therapies. Relevant outcomes are OS, functional outcomes, quality of life, and treatment-related morbidity. This evidence has suggested that RE provides outcomes similar to standard therapies and historical controls for individuals with neuroendocrine tumor-related symptoms or progression of the liver tumor. The evidence is sufficient to determine that the technology results in an improvement in the net health outcome.

For individuals who have unresectable intrahepatic metastases from colorectal cancer and prior treatment failure who receive RE, the evidence includes several small- to moderate-sized RCTs, prospective trials, and retrospective studies using a variety of comparators, as well as systematic reviews of these studies. Relevant outcomes are OS, functional outcomes, quality of life, and treatment-related morbidity. While studies of individuals with prior chemotherapy failure have methodologic problems and have not shown definitive superiority of RE compared with alternatives in terms of survival benefit, they tend to show greater tumor response and significantly delayed disease progression, particularly with combined use of RE and chemotherapy. For example, the Efficacy Evaluation of TheraSphere Following Failed First Line Chemotherapy in Metastatic Colorectal Cancer (EPOCH) RCT found significantly prolonged primary endpoints of progression-

©2024 Blue Cross and Blue Shield of Louisiana

Blue Cross and Blue Shield of Louisiana is an independent licensee of the Blue Cross and Blue Shield Association and incorporated as Louisiana Health Service & Indemnity Company.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without permission from Blue Cross and Blue Shield of Louisiana.



Radioembolization for Primary and Metastatic Tumors of the Liver

Policy # 00110

Original Effective Date: 02/23/2004

Current Effective Date: 05/13/2024

free survival (PFS) (hazard ratio [HR], 0.69; 95% confidence interval [CI], 0.54 to 0.88) and hepatic PFS (HR, 0.59; 95% CI, 0.46 to 0.77) with combined RE and chemotherapy in individuals who had progressed on first-line chemotherapy. The evidence is sufficient to determine that the technology results in an improvement in the net health outcome.

For individuals who have unresectable intrahepatic metastases from other cancers (eg, breast, melanoma, pancreatic) who receive RE, the evidence includes nonrandomized studies. Relevant outcomes are OS, functional outcomes, quality of life, and treatment-related morbidity. These studies have shown significant tumor response; however, improvement in survival has not been demonstrated in controlled comparative studies. The evidence is insufficient to determine that the technology results in an improvement in the net health outcome.

Supplemental Information

Clinical Input From Physician Specialty Societies and Academic Medical Centers

While the various physician specialty societies and academic medical centers may collaborate with and make recommendations during this process, through the provision of appropriate reviewers, input received does not represent an endorsement or position statement by the physician specialty societies or academic medical centers, unless otherwise noted.

2015 Input

In response to requests, input was received from 3 physician specialty societies (with 5 individual responses) and 1 academic medical center (with 4 individual responses), for a total of 9 respondents, while this policy was under review in 2015. There was consensus supporting the use of radioembolization (RE) for hepatic metastases from melanoma, particularly ocular melanoma, and breast cancer. There was also consensus supporting the use of RE for treatment of primary intrahepatic cholangiocarcinoma. There was less consensus on the use of RE for hepatic metastases from other specific tumor types, including pancreatic cancer. However, many reviewers supported the use of RE for treatment of other radiosensitive tumors metastatic to the liver with the liver-limited or liver-dominant disease for symptom palliation or prolongation of survival.

2010 to 2011 Input

In response to requests, input was received from 2 physician specialty societies (with 5 individual responses) and 6 academic medical centers, for a total of 11 respondents, while this policy was under

©2024 Blue Cross and Blue Shield of Louisiana

Blue Cross and Blue Shield of Louisiana is an independent licensee of the Blue Cross and Blue Shield Association and incorporated as Louisiana Health Service & Indemnity Company.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without permission from Blue Cross and Blue Shield of Louisiana.



Radioembolization for Primary and Metastatic Tumors of the Liver

Policy # 00110

Original Effective Date: 02/23/2004

Current Effective Date: 05/13/2024

review in 2010 and again in 2011. For the 2011 review, input was received from 2 physician specialty societies and 3 academic medical centers; all but 1 academic medical center had provided input in 2010. There was strong support for the use of RE in individuals with primary hepatocellular carcinoma, as a bridge to liver transplant in hepatocellular carcinoma, and in neuroendocrine tumors. There was also strong support for use of RE in individuals with liver metastases from colorectal cancers and support for its use in individuals with liver metastases from other cancers but with less consensus than for colorectal metastases. Those providing input were split as to whether RE should be used as monotherapy or in combination with other agents.

The support for the use of RE in individuals with chemotherapy-refractory colorectal metastases was primarily to prolong time to tumor progression and subsequent liver failure (a major cause of morbidity and mortality in this patient population), potentially prolonging survival. Additional support for the use of RE in this setting was for the palliation of symptoms from tumor growth and tumor bulk.

Support for the use of RE for liver metastases from tumors other than colorectal or neuroendocrine was generally limited to a number of specific tumor types, in particular, ocular melanoma, cholangiocarcinoma, breast, and pancreas.

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.

American College of Radiology et al

In 2021, the American College of Radiology issued a practice parameter jointly developed with the American Brachytherapy Society, the American College of Nuclear Medicine, the American Society for Radiation Oncology, the Society of Interventional Radiology, and the Society of Nuclear Medicine and Molecular Imaging addressing the use of RE for the treatment of liver malignancies with glass- or resin-based yttrium-90 microspheres. The guidelines provided indications and contraindications for treatment as follows:

- "Indications for both agents include but are not limited to the following:

©2024 Blue Cross and Blue Shield of Louisiana

Blue Cross and Blue Shield of Louisiana is an independent licensee of the Blue Cross and Blue Shield Association and incorporated as Louisiana Health Service & Indemnity Company.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without permission from Blue Cross and Blue Shield of Louisiana.



Radioembolization for Primary and Metastatic Tumors of the Liver

Policy # 00110

Original Effective Date: 02/23/2004

Current Effective Date: 05/13/2024

1. The presence of unresectable or inoperable primary or secondary liver malignancies (particularly colorectal cancer and neuroendocrine tumor metastases). The tumor burden should be liver dominant, not necessarily exclusive to the liver. Individuals should also have a performance status that will allow them to benefit from such therapy.
2. A life expectancy of at least 3 months."
- "Absolute contraindications include the following:
 1. Inability to catheterize the hepatic artery
 2. Fulminant liver failure
 3. Initial mapping angiography and/or technetium-99m macroaggregated albumin (MAA) hepatic arterial perfusion scintigraphy demonstrating nontarget deposition to the gastrointestinal organs that cannot be corrected by angiographic techniques.
 4. Pretreatment hepatic arterial administration with technetium-99m MAA demonstrative of unfavorable (or unacceptable) shunt function between the liver and the pulmonary parenchyma. This shunt fraction must not be greater than acceptable limits specific to each brachytherapy device.
 5. Active hepatic infection
 6. Therapy during pregnancy may possibly be an option in extraordinary circumstances and with multidisciplinary consult and considerations."
- "Relative contraindications include the following:
 1. Excessive tumor burden in the liver with greater than 50 to 70% of the parenchyma replaced by tumor. In the setting of more extensive tumor burden, treatment can be considered if synthetic hepatic function is preserved.
 2. Total bilirubin greater than 2 mg/dL (in the absence of obstructive cause), which indicates severe liver function impairment. Nonobstructive bilirubin elevations may indicate that liver metastases have caused liver impairment to the degree that risks outweigh benefits for this therapy. In contrast, individuals with hepatocellular carcinoma (HCC) and elevated bilirubin may be treated with radioembolization if a segmental or subsegmental infusion can be performed.
 3. Prior radiation therapy to the liver or upper abdomen that included a significant volume of the liver (clinical judgment by the [authorized user] required).
 4. Care must be employed when individuals are on systemic therapies that may potentiate or may alter the impact of radioembolization and should use caution when combining therapies."

©2024 Blue Cross and Blue Shield of Louisiana

Blue Cross and Blue Shield of Louisiana is an independent licensee of the Blue Cross and Blue Shield Association and incorporated as Louisiana Health Service & Indemnity Company.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without permission from Blue Cross and Blue Shield of Louisiana.



Radioembolization for Primary and Metastatic Tumors of the Liver

Policy # 00110

Original Effective Date: 02/23/2004

Current Effective Date: 05/13/2024

American Society of Clinical Oncology

The 2023 American Society of Clinical Oncology (ASCO) guidelines for the treatment of metastatic colorectal cancer (mCRC) makes the following relevant recommendation:

- "SIRT [selective internal radiation therapy] is not routinely recommended for individuals with mCRC and unilobar or bilobar metastases of the liver (Type: Evidence-based, harms outweigh benefits; Evidence quality: Low; Strength of recommendation: Weak)."

National Comprehensive Cancer Network

Primary Hepatocellular Carcinoma

The National Comprehensive Cancer Network (NCCN) guidelines (v.1.2023) on the treatment of hepatocellular carcinoma indicate that the use of arterially directed therapies, including transarterial bland embolization, transarterial chemoembolization, and drug-eluting beads transarterial chemoembolization, and RE with yttrium-90 microspheres may be appropriate provided that the arterial blood supply can be isolated without excessive nontarget treatment. Individuals should be considered for locoregional therapy if they are not candidates for potential curative treatments (resection, transplantation, and for small lesions, ablative strategies). RE with yttrium-90 microspheres has an increased risk of radiation-induced liver disease in individuals with bilirubin levels greater than 2 mg/dL. Delivery of 205 Gy or more to the tumor may be associated with increased overall survival. A dose of greater than 400 Gy to 25% of the liver or less in individuals with Child-Pugh A liver function is recommended. RE may be more appropriate in some individuals with advanced HCC, specifically individuals with segmental or lobar portal vein, rather than main portal vein thrombosis.

Metastatic Neuroendocrine Tumors

The NCCN guidelines (v.2.2022) on the treatment of neuroendocrine tumors recommend consideration of transarterial radioembolization (TARE) for lobar or segmental disease distribution and in individuals with prior Whipple surgery or biliary tract instrumentation. TARE is better tolerated than transarterial embolization/transarterial chemoembolization, but late radioembolization-induced chronic hepatotoxicity may occur in long-term survivors, and is particularly a concern among individuals undergoing bilobar radioembolization.

Metastatic Colon Cancer

The NCCN guidelines (v.2.2023) on the treatment of colon cancer provides a consensus recommendation that: "...arterial-directed catheter therapy, in particular yttrium-90 microsphere

©2024 Blue Cross and Blue Shield of Louisiana

Blue Cross and Blue Shield of Louisiana is an independent licensee of the Blue Cross and Blue Shield Association and incorporated as Louisiana Health Service & Indemnity Company.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without permission from Blue Cross and Blue Shield of Louisiana.



Radioembolization for Primary and Metastatic Tumors of the Liver

Policy # 00110

Original Effective Date: 02/23/2004

Current Effective Date: 05/13/2024

selective internal radiation, is an option in highly selected individuals with chemotherapy-resistant/-refractory disease and with predominant hepatic metastases." RE may also be considered "when hepatic metastatic disease is not optimally resectable based on insufficient remnant liver volume..." The guidelines also note that "further investigation is necessary to identify the role of radioembolization at earlier stages of disease, particularly in individuals with right-sided primary origin."

Metastatic Uveal Melanoma

The NCCN guidelines (v.1.2023) on the treatment of uveal melanoma state the following regarding RE: "Further study is required to determine the appropriate individuals for and risks and benefits of this approach." [\[National Comprehensive Cancer Network. Melanoma: U.... al.pdf. Accessed May 23, 2023.\]](#)

National Institute for Health and Care Excellence

Primary Hepatobiliary Carcinoma

The July 2013 NICE interventional procedures guidance on selective internal radiation therapy for primary hepatocellular carcinoma states that the evidence for efficacy and safety are adequate for use with normal arrangements. However, "uncertainties remain about its comparative effectiveness, and clinicians are encouraged to enter eligible individuals into trials comparing the procedure against other forms of treatment."

In March 2021, a NICE technology appraisal guidance on selective internal radiation therapies (SIRTs) for treating hepatocellular carcinoma was published, providing specific evidence-based recommendations for the use of SIR-Spheres (Sirtex), TheraSphere (Boston Scientific), and QuiremSpheres (Quirem Medical). The guidance states that RE with SIR-Spheres or TheraSphere is recommended as an option for treating unresectable advanced hepatocellular carcinoma in adults only if "used for people with Child-Pugh grade A liver impairment when conventional transarterial therapies are inappropriate, and the company provides [the microspheres] according to the commercial arrangement." The guidance also stated that "clinical trial data for these SIRTs compared with other treatment options are limited. But, compared with sorafenib, SIRTs may have fewer and more manageable adverse effects, which can improve quality of life." The use of QuiremSpheres, imageable holmium-166 microspheres, was not recommended due to reduced clinical efficacy

©2024 Blue Cross and Blue Shield of Louisiana

Blue Cross and Blue Shield of Louisiana is an independent licensee of the Blue Cross and Blue Shield Association and incorporated as Louisiana Health Service & Indemnity Company.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without permission from Blue Cross and Blue Shield of Louisiana.



Radioembolization for Primary and Metastatic Tumors of the Liver

Policy # 00110

Original Effective Date: 02/23/2004

Current Effective Date: 05/13/2024

compared to sorafenib and higher cost. QuiremSpheres received its CE mark in April 2015 in Europe and is not commercially available in the U.S.

Primary Intrahepatic Cholangiocarcinoma

The October 2018 NICE interventional procedures guidance on selective internal radiation therapy for unresectable primary intrahepatic cholangiocarcinoma state that there are "well-recognized, serious but rare safety concerns. Evidence on its efficacy is inadequate in quantity and quality. Therefore, this procedure should only be used in the context of research."

Metastatic Colon Cancer

The March 2020 NICE interventional procedures guidance on selective internal radiation therapy for unresectable colorectal metastases in the liver states that "in people who cannot tolerate chemotherapy or have liver metastases that are refractory to chemotherapy, there is evidence of efficacy but this is limited, particularly for important outcomes such as quality of life. Therefore, in these people, this procedure should only be used with special arrangements for clinical governance, consent, and audit or research."

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

Some currently ongoing and unpublished trials that might influence this review are listed in Table 1.



Louisiana

Radioembolization for Primary and Metastatic Tumors of the Liver

Policy # 00110

Original Effective Date: 02/23/2004

Current Effective Date: 05/13/2024

Table 1. Summary of Key Trials

NCT No.	Name	Planned Enrollment	Completion Date
<i>Hepatocellular Carcinoma</i>			
<i>Ongoing</i>			
NCT04736121 ^a	A Prospective, Multicenter, Open-label Single Arm Study Evaluating the Safety & Efficacy of Selective Internal Radiation Therapy Using SIR-Spheres ^{®†} Y-90 Resin Microspheres on DoR & ORR in Unresectable Hepatocellular Carcinoma Individuals (DOORwaY90)	100	Jun 2025 (recruiting)
NCT04522544 ^a	A Phase II Study of Immunotherapy With Durvalumab (MEDI4736) and Tremelimumab in Combination With Either Y-90 SIRT or TACE for Intermediate Stage HCC With Pick-the-winner Design	84	Sep 2024 (recruiting)
NCT04069468 ^a	A Prospective, Post Approval, Multiple Centre, Open-Label, Non-Interventional, Registry Study to Evaluate Effectiveness of TheraSphere ^{®†} in Clinical Practice in France (PROACTIF)	500	Jan 2025 (recruiting)
NCT05377034 ^a	A Multinational, Double-blind, Placebo-Controlled, Parallel Randomized Arms, Phase II Trial to Compare Safety and Efficacy of Selective Internal Radiation Therapy (Y-90 Resin Microspheres) Followed by Atezolizumab Plus Bevacizumab Versus Selective Internal Radiation Therapy (SIRT-Y90) Followed by Placebo in Individuals With Locally Advanced Hepatocellular Carcinoma (HCC) (STRATUM)	176	Nov 2025 (recruiting)

©2024 Blue Cross and Blue Shield of Louisiana

Blue Cross and Blue Shield of Louisiana is an independent licensee of the Blue Cross and Blue Shield Association and incorporated as Louisiana Health Service & Indemnity Company.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without permission from Blue Cross and Blue Shield of Louisiana.



Louisiana

Radioembolization for Primary and Metastatic Tumors of the Liver

Policy # 00110

Original Effective Date: 02/23/2004

Current Effective Date: 05/13/2024

NCT05063565 ^a	An Open-Label, Prospective, Multi-Center, Randomized Clinical Trial to Evaluate The Efficacy and Safety Of TheraSphere Followed by Durvalumab (Imfinzi [®]) [‡] With Tremelimumab, Versus TheraSphere Alone For Hepatocellular Carcinoma (HCC) (ROWAN)	150	Apr 2026 (suspended)
<i>Unpublished</i>			
NCT04090645	A Humanitarian Device Exemption Treatment Protocol of TheraSphere for Treatment of Unresectable Primary or Unresectable Secondary Liver Cancer	187	Apr 2021 (completed)
NCT01176604	Protocol for Use of TheraSphere ^{®‡} for Treatment of Unresectable Hepatocellular Carcinoma	305	Apr 2021 (completed)
NCT01556490 ^a	A Phase III Clinical Trial of Intra-arterial TheraSphere ^{®‡} in the Treatment of Individuals With Unresectable Hepatocellular Carcinoma (HCC) (STOP-HCC)	526	Apr 2022 (completed)
NCT02072356	A Humanitarian Device Exemption Treatment Protocol of TheraSphere ^{®‡} For Treatment of Unresectable Hepatocellular Carcinoma	800	Jun 2021 (completed)
<i>Metastatic Colorectal Cancer</i>			
NCT05195710 ^a	Preoperative Y-90 Radioembolization for Tumor Control and Future Liver Remnant Hypertrophy in Individuals With Colorectal Liver Metastases	50	Mar 2024 (recruiting)
<i>Intrahepatic Cholangiocarcinoma</i>			
<i>Unpublished</i>			

©2024 Blue Cross and Blue Shield of Louisiana

Blue Cross and Blue Shield of Louisiana is an independent licensee of the Blue Cross and Blue Shield Association and incorporated as Louisiana Health Service & Indemnity Company.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without permission from Blue Cross and Blue Shield of Louisiana.





Radioembolization for Primary and Metastatic Tumors of the Liver

Policy # 00110

Original Effective Date: 02/23/2004

Current Effective Date: 05/13/2024

3. Tao R, Li X, Ran R, et al. A mixed analysis comparing nine minimally invasive surgeries for unresectable hepatocellular carcinoma patients. *Oncotarget*. Jan 17 2017; 8(3): 5460-5473. PMID 27705924
4. Pollock RF, Brennan VK, Shergill S, et al. A systematic literature review and network meta-analysis of first-line treatments for unresectable hepatocellular carcinoma based on data from randomized controlled trials. *Expert Rev Anticancer Ther*. Mar 2021; 21(3): 341-349. PMID 33131346
5. Venerito M, Pech M, Canbay A, et al. NEMESIS: Noninferiority, Individual-Patient Metaanalysis of Selective Internal Radiation Therapy with 90 Y Resin Microspheres Versus Sorafenib in Advanced Hepatocellular Carcinoma. *J Nucl Med*. Dec 2020; 61(12): 1736-1742. PMID 32358087
6. Yang B, Liang J, Qu Z, et al. Transarterial strategies for the treatment of unresectable hepatocellular carcinoma: A systematic review. *PLoS One*. 2020; 15(2): e0227475. PMID 32074102
7. Ludwig JM, Zhang D, Xing M, et al. Meta-analysis: adjusted indirect comparison of drug-eluting bead transarterial chemoembolization versus 90 Y-radioembolization for hepatocellular carcinoma. *Eur Radiol*. May 2017; 27(5): 2031-2041. PMID 27562480
8. Lobo L, Yakoub D, Picado O, et al. Unresectable Hepatocellular Carcinoma: Radioembolization Versus Chemoembolization: A Systematic Review and Meta-analysis. *Cardiovasc Intervent Radiol*. Nov 2016; 39(11): 1580-1588. PMID 27586657
9. Facciorusso A, Serviddio G, Muscatiello N. Transarterial radioembolization vs chemoembolization for hepatocarcinoma patients: A systematic review and meta-analysis. *World J Hepatol*. Jun 28 2016; 8(18): 770-8. PMID 27366304
10. Vente MA, Wondergem M, van der Tweel I, et al. Yttrium-90 microsphere radioembolization for the treatment of liver malignancies: a structured meta-analysis. *Eur Radiol*. Apr 2009; 19(4): 951-9. PMID 18989675
11. Dhondt E, Lambert B, Hermie L, et al. 90 Y Radioembolization versus Drug-eluting Bead Chemoembolization for Unresectable Hepatocellular Carcinoma: Results from the TRACE Phase II Randomized Controlled Trial. *Radiology*. Jun 2022; 303(3): 699-710. PMID 35258371
12. Facciorusso A, Bargellini I, Cela M, et al. Comparison between Y90 Radioembolization Plus Sorafenib and Y90 Radioembolization alone in the Treatment of Hepatocellular Carcinoma: A Propensity Score Analysis. *Cancers (Basel)*. Apr 07 2020; 12(4). PMID 32272656
13. Padia SA, Johnson GE, Horton KJ, et al. Segmental Yttrium-90 Radioembolization versus Segmental Chemoembolization for Localized Hepatocellular Carcinoma: Results of a Single-

©2024 Blue Cross and Blue Shield of Louisiana

Blue Cross and Blue Shield of Louisiana is an independent licensee of the Blue Cross and Blue Shield Association and incorporated as Louisiana Health Service & Indemnity Company.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without permission from Blue Cross and Blue Shield of Louisiana.



Radioembolization for Primary and Metastatic Tumors of the Liver

Policy # 00110

Original Effective Date: 02/23/2004

Current Effective Date: 05/13/2024

- Center, Retrospective, Propensity Score-Matched Study. *J Vasc Interv Radiol.* Jun 2017; 28(6): 777-785.e1. PMID 28365172
14. Soydal C, Arslan MF, Kucuk ON, et al. Comparison of survival, safety, and efficacy after transarterial chemoembolization and radioembolization of Barcelona Clinic Liver Cancer stage B-C hepatocellular cancer patients. *Nucl Med Commun.* Jun 2016; 37(6): 646-9. PMID 26905317
 15. Oladeru OT, Miccio JA, Yang J, et al. Conformal external beam radiation or selective internal radiation therapy-a comparison of treatment outcomes for hepatocellular carcinoma. *J Gastrointest Oncol.* Jun 2016; 7(3): 433-40. PMID 27284477
 16. Gramenzi A, Golfieri R, Mosconi C, et al. Yttrium-90 radioembolization vs sorafenib for intermediate-locally advanced hepatocellular carcinoma: a cohort study with propensity score analysis. *Liver Int.* Mar 2015; 35(3): 1036-47. PMID 24750853
 17. Kulik L, Heimbach JK, Zaiem F, et al. Therapies for patients with hepatocellular carcinoma awaiting liver transplantation: A systematic review and meta-analysis. *Hepatology.* Jan 2018; 67(1): 381-400. PMID 28859222
 18. Salem R, Gordon AC, Mouli S, et al. Y90 Radioembolization Significantly Prolongs Time to Progression Compared With Chemoembolization in Patients With Hepatocellular Carcinoma. *Gastroenterology.* Dec 2016; 151(6): 1155-1163.e2. PMID 27575820
 19. Kulik L, Vouche M, Koppe S, et al. Prospective randomized pilot study of Y90+/-sorafenib as bridge to transplantation in hepatocellular carcinoma. *J Hepatol.* Aug 2014; 61(2): 309-17. PMID 24681342
 20. Salem R, Johnson GE, Kim E, et al. Yttrium-90 Radioembolization for the Treatment of Solitary, Unresectable HCC: The LEGACY Study. *Hepatology.* Nov 2021; 74(5): 2342-2352. PMID 33739462
 21. U.S. Food and Drug Administration. Summary of Safety and Effectiveness Data (SSED): TheraSphere. https://www.accessdata.fda.gov/cdrh_docs/pdf20/P200029B.pdf.
 22. Pellegrinelli J, Chevallier O, Manfredi S, et al. Transarterial Radioembolization of Hepatocellular Carcinoma, Liver-Dominant Hepatic Colorectal Cancer Metastases, and Cholangiocarcinoma Using Yttrium90 Microspheres: Eight-Year Single-Center Real-Life Experience. *Diagnostics (Basel).* Jan 14 2021; 11(1). PMID 33466706
 23. Gabr A, Kulik L, Mouli S, et al. Liver Transplantation Following Yttrium-90 Radioembolization: 15-Year Experience in 207-Patient Cohort. *Hepatology.* Mar 2021; 73(3): 998-1010. PMID 32416631

©2024 Blue Cross and Blue Shield of Louisiana

Blue Cross and Blue Shield of Louisiana is an independent licensee of the Blue Cross and Blue Shield Association and incorporated as Louisiana Health Service & Indemnity Company.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without permission from Blue Cross and Blue Shield of Louisiana.



Radioembolization for Primary and Metastatic Tumors of the Liver

Policy # 00110

Original Effective Date: 02/23/2004

Current Effective Date: 05/13/2024

24. Zori AG, Ismael MN, Limaye AR, et al. Locoregional Therapy Protocols With and Without Radioembolization for Hepatocellular Carcinoma as Bridge to Liver Transplantation. *Am J Clin Oncol*. May 2020; 43(5): 325-333. PMID 32079854
25. Tohme S, Sukato D, Chen HW, et al. Yttrium-90 radioembolization as a bridge to liver transplantation: a single-institution experience. *J Vasc Interv Radiol*. Nov 2013; 24(11): 1632-8. PMID 24160821
26. Ramanathan R, Sharma A, Lee DD, et al. Multimodality therapy and liver transplantation for hepatocellular carcinoma: a 14-year prospective analysis of outcomes. *Transplantation*. Jul 15 2014; 98(1): 100-6. PMID 24503764
27. Lewandowski RJ, Kulik LM, Riaz A, et al. A comparative analysis of transarterial downstaging for hepatocellular carcinoma: chemoembolization versus radioembolization. *Am J Transplant*. Aug 2009; 9(8): 1920-8. PMID 19552767
28. National Organization for Rare Disorders. Rare Disease Database: Cholangiocarcinoma. 2020; <https://rarediseases.org/rare-diseases/cholangiocarcinoma>.
29. National Comprehensive Cancer Network (NCCN). NCCN Clinical Practice Guidelines in Oncology. Hepatocellular Carcinoma. Version 1.2023. https://www.nccn.org/professionals/physician_gls/pdf/hepatobiliary.pdf.
30. Schartz DA, Porter M, Schartz E, et al. Transarterial Yttrium-90 Radioembolization for Unresectable Intrahepatic Cholangiocarcinoma: A Systematic Review and Meta-Analysis. *J Vasc Interv Radiol*. Jun 2022; 33(6): 679-686. PMID 35219834
31. Edeline J, Lamarca A, McNamara MG, et al. Locoregional therapies in patients with intrahepatic cholangiocarcinoma: A systematic review and pooled analysis. *Cancer Treat Rev*. Sep 2021; 99: 102258. PMID 34252720
32. Yu Q, Liu C, Pillai A, et al. Twenty Years of Radiation Therapy of Unresectable Intrahepatic Cholangiocarcinoma: Internal or External? A Systematic Review and Meta-Analysis. *Liver Cancer*. Sep 2021; 10(5): 433-450. PMID 34721506
33. Mosconi C, Solaini L, Vara G, et al. Transarterial Chemoembolization and Radioembolization for Unresectable Intrahepatic Cholangiocarcinoma-a Systemic Review and Meta-Analysis. *Cardiovasc Intervent Radiol*. May 2021; 44(5): 728-738. PMID 33709272
34. Boehm LM, Jayakrishnan TT, Miura JT, et al. Comparative effectiveness of hepatic artery based therapies for unresectable intrahepatic cholangiocarcinoma. *J Surg Oncol*. Feb 2015; 111(2): 213-20. PMID 25176325

©2024 Blue Cross and Blue Shield of Louisiana

Blue Cross and Blue Shield of Louisiana is an independent licensee of the Blue Cross and Blue Shield Association and incorporated as Louisiana Health Service & Indemnity Company.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without permission from Blue Cross and Blue Shield of Louisiana.



Radioembolization for Primary and Metastatic Tumors of the Liver

Policy # 00110

Original Effective Date: 02/23/2004

Current Effective Date: 05/13/2024

35. Robinson TJ, Du L, Matsuoka L, et al. Survival and Toxicities after Yttrium-90 Transarterial Radioembolization of Cholangiocarcinoma in the RESiN Registry. *J Vasc Interv Radiol.* Apr 2023; 34(4): 694-701.e3. PMID 36509236
36. Chan SL, Chotipanich C, Choo SP, et al. Selective Internal Radiation Therapy with Yttrium-90 Resin Microspheres Followed by Gemcitabine plus Cisplatin for Unresectable Intrahepatic Cholangiocarcinoma: A Phase 2 Single-Arm Multicenter Clinical Trial. *Liver Cancer.* Sep 2022; 11(5): 451-459. PMID 36158588
37. Kis B, Shridhar R, Mhaskar R, et al. Radioembolization with Yttrium-90 Glass Microspheres as a First-Line Treatment for Unresectable Intrahepatic Cholangiocarcinoma-A Prospective Feasibility Study. *J Vasc Interv Radiol.* May 18 2023. PMID 37210030
38. Edeline J, Toucheffeu Y, Guiu B, et al. Radioembolization Plus Chemotherapy for First-line Treatment of Locally Advanced Intrahepatic Cholangiocarcinoma: A Phase 2 Clinical Trial. *JAMA Oncol.* Jan 01 2020; 6(1): 51-59. PMID 31670746
39. Riby D, Mazzotta AD, Bergeat D, et al. Downstaging with Radioembolization or Chemotherapy for Initially Unresectable Intrahepatic Cholangiocarcinoma. *Ann Surg Oncol.* Oct 2020; 27(10): 3729-3737. PMID 32472411
40. Buettner S, Braat AJAT, Margonis GA, et al. Yttrium-90 Radioembolization in Intrahepatic Cholangiocarcinoma: A Multicenter Retrospective Analysis. *J Vasc Interv Radiol.* Jul 2020; 31(7): 1035-1043.e2. PMID 32473757
41. Jia Z, Paz-Fumagalli R, Frey G, et al. Resin-based Yttrium-90 microspheres for unresectable and failed first-line chemotherapy intrahepatic cholangiocarcinoma: preliminary results. *J Cancer Res Clin Oncol.* Mar 2017; 143(3): 481-489. PMID 27826686
42. Mosconi C, Gramenzi A, Ascanio S, et al. Yttrium-90 radioembolization for unresectable/recurrent intrahepatic cholangiocarcinoma: a survival, efficacy and safety study. *Br J Cancer.* Jul 26 2016; 115(3): 297-302. PMID 27336601
43. Rayar M, Sulpice L, Edeline J, et al. Intra-arterial yttrium-90 radioembolization combined with systemic chemotherapy is a promising method for downstaging unresectable huge intrahepatic cholangiocarcinoma to surgical treatment. *Ann Surg Oncol.* Sep 2015; 22(9): 3102-8. PMID 25623598
44. Mouli S, Memon K, Baker T, et al. Yttrium-90 radioembolization for intrahepatic cholangiocarcinoma: safety, response, and survival analysis. *J Vasc Interv Radiol.* Aug 2013; 24(8): 1227-34. PMID 23602420

©2024 Blue Cross and Blue Shield of Louisiana

Blue Cross and Blue Shield of Louisiana is an independent licensee of the Blue Cross and Blue Shield Association and incorporated as Louisiana Health Service & Indemnity Company.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without permission from Blue Cross and Blue Shield of Louisiana.



Radioembolization for Primary and Metastatic Tumors of the Liver

Policy # 00110

Original Effective Date: 02/23/2004

Current Effective Date: 05/13/2024

45. Hoffmann RT, Paprottka PM, Schön A, et al. Transarterial hepatic yttrium-90 radioembolization in patients with unresectable intrahepatic cholangiocarcinoma: factors associated with prolonged survival. *Cardiovasc Intervent Radiol*. Feb 2012; 35(1): 105-16. PMID 21431970
46. Haug AR, Heinemann V, Bruns CJ, et al. 18F-FDG PET independently predicts survival in patients with cholangiocellular carcinoma treated with 90Y microspheres. *Eur J Nucl Med Mol Imaging*. Jun 2011; 38(6): 1037-45. PMID 21308371
47. Saxena A, Bester L, Chua TC, et al. Yttrium-90 radiotherapy for unresectable intrahepatic cholangiocarcinoma: a preliminary assessment of this novel treatment option. *Ann Surg Oncol*. Feb 2010; 17(2): 484-91. PMID 19876691
48. Ibrahim SM, Mulcahy MF, Lewandowski RJ, et al. Treatment of unresectable cholangiocarcinoma using yttrium-90 microspheres: results from a pilot study. *Cancer*. Oct 15 2008; 113(8): 2119-28. PMID 18759346
49. Paprottka KJ, Galiè F, Ingrischi M, et al. Outcome and Safety after 103 Radioembolizations with Yttrium-90 Resin Microspheres in 73 Patients with Unresectable Intrahepatic Cholangiocarcinoma-An Evaluation of Predictors. *Cancers (Basel)*. Oct 27 2021; 13(21). PMID 34771563
50. Sarwar A, Ali A, Ljuboja D, et al. Neoadjuvant Yttrium-90 Transarterial Radioembolization with Resin Microspheres Prescribed Using the Medical Internal Radiation Dose Model for Intrahepatic Cholangiocarcinoma. *J Vasc Interv Radiol*. Nov 2021; 32(11): 1560-1568. PMID 34454031
51. Ahmed O, Yu Q, Patel M, et al. Yttrium-90 Radioembolization and Concomitant Systemic Gemcitabine, Cisplatin, and Capecitabine as the First-Line Therapy for Locally Advanced Intrahepatic Cholangiocarcinoma. *J Vasc Interv Radiol*. Apr 2023; 34(4): 702-709. PMID 36521794
52. Cancer.Net. Neuroendocrine Tumors: Statistics. March 2023; <https://www.cancer.net/cancer-types/neuroendocrine-tumors/statistics>.
53. King J, Quinn R, Glenn DM, et al. Radioembolization with selective internal radiation microspheres for neuroendocrine liver metastases. *Cancer*. Sep 01 2008; 113(5): 921-9. PMID 18618495
54. Ngo L, Elnahla A, Attia AS, et al. Chemoembolization Versus Radioembolization for Neuroendocrine Liver Metastases: A Meta-analysis Comparing Clinical Outcomes. *Ann Surg Oncol*. Apr 2021; 28(4): 1950-1958. PMID 33393019

©2024 Blue Cross and Blue Shield of Louisiana

Blue Cross and Blue Shield of Louisiana is an independent licensee of the Blue Cross and Blue Shield Association and incorporated as Louisiana Health Service & Indemnity Company.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without permission from Blue Cross and Blue Shield of Louisiana.



Radioembolization for Primary and Metastatic Tumors of the Liver

Policy # 00110

Original Effective Date: 02/23/2004

Current Effective Date: 05/13/2024

55. Frilling A, Clift AK, Braat AJAT, et al. Radioembolisation with 90Y microspheres for neuroendocrine liver metastases: an institutional case series, systematic review and meta-analysis. *HPB (Oxford)*. Jul 2019; 21(7): 773-783. PMID 30733049
56. Devic Z, Rosenberg J, Braat AJ, et al. The efficacy of hepatic 90Y resin radioembolization for metastatic neuroendocrine tumors: a meta-analysis. *J Nucl Med*. Sep 2014; 55(9): 1404-10. PMID 25012459
57. Egger ME, Armstrong E, Martin RC, et al. Transarterial Chemoembolization vs Radioembolization for Neuroendocrine Liver Metastases: A Multi-Institutional Analysis. *J Am Coll Surg*. Apr 2020; 230(4): 363-370. PMID 32032719
58. Engelman ES, Leon-Ferre R, Naraev BG, et al. Comparison of transarterial liver-directed therapies for low-grade metastatic neuroendocrine tumors in a single institution. *Pancreas*. Mar 2014; 43(2): 219-25. PMID 24518499
59. Rhee TK, Lewandowski RJ, Liu DM, et al. 90Y Radioembolization for metastatic neuroendocrine liver tumors: preliminary results from a multi-institutional experience. *Ann Surg*. Jun 2008; 247(6): 1029-35. PMID 18520231
60. Cao CQ, Yan TD, Bester L, et al. Radioembolization with yttrium microspheres for neuroendocrine tumour liver metastases. *Br J Surg*. Apr 2010; 97(4): 537-43. PMID 20205229
61. Kennedy AS, Dezarn WA, McNeillie P, et al. Radioembolization for unresectable neuroendocrine hepatic metastases using resin 90Y-microspheres: early results in 148 patients. *Am J Clin Oncol*. Jun 2008; 31(3): 271-9. PMID 18525307
62. Memon K, Lewandowski RJ, Mulcahy MF, et al. Radioembolization for neuroendocrine liver metastases: safety, imaging, and long-term outcomes. *Int J Radiat Oncol Biol Phys*. Jul 01 2012; 83(3): 887-94. PMID 22137020
63. Paprottka PM, Hoffmann RT, Haug A, et al. Radioembolization of symptomatic, unresectable neuroendocrine hepatic metastases using yttrium-90 microspheres. *Cardiovasc Intervent Radiol*. Apr 2012; 35(2): 334-42. PMID 21847708
64. Peker A, Çiçek O, Soydal Ç, et al. Radioembolization with yttrium-90 resin microspheres for neuroendocrine tumor liver metastases. *Diagn Interv Radiol*. 2015; 21(1): 54-9. PMID 25430526
65. Jia Z, Paz-Fumagalli R, Frey G, et al. Single-institution experience of radioembolization with yttrium-90 microspheres for unresectable metastatic neuroendocrine liver tumors. *J Gastroenterol Hepatol*. Sep 2017; 32(9): 1617-1623. PMID 28132407
66. Fan KY, Wild AT, Halappa VG, et al. Neuroendocrine tumor liver metastases treated with yttrium-90 radioembolization. *Contemp Clin Trials*. Sep 2016; 50: 143-9. PMID 27520932

©2024 Blue Cross and Blue Shield of Louisiana

Blue Cross and Blue Shield of Louisiana is an independent licensee of the Blue Cross and Blue Shield Association and incorporated as Louisiana Health Service & Indemnity Company.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without permission from Blue Cross and Blue Shield of Louisiana.



Radioembolization for Primary and Metastatic Tumors of the Liver

Policy # 00110

Original Effective Date: 02/23/2004

Current Effective Date: 05/13/2024

67. Tice J. Selective internal radiation therapy or radioembolization for inoperable liver metastases from colorectal cancer San Francisco, CA: California Technology Assessment Forum; 2010.
68. Saxena A, Bester L, Shan L, et al. A systematic review on the safety and efficacy of yttrium-90 radioembolization for unresectable, chemorefractory colorectal cancer liver metastases. *J Cancer Res Clin Oncol.* Apr 2014; 140(4): 537-47. PMID 24318568
69. Gray B, Van Hazel G, Hope M, et al. Randomised trial of SIR-Spheres plus chemotherapy vs. chemotherapy alone for treating patients with liver metastases from primary large bowel cancer. *Ann Oncol.* Dec 2001; 12(12): 1711-20. PMID 11843249
70. Hendlisz A, Van den Eynde M, Peeters M, et al. Phase III trial comparing protracted intravenous fluorouracil infusion alone or with yttrium-90 resin microspheres radioembolization for liver-limited metastatic colorectal cancer refractory to standard chemotherapy. *J Clin Oncol.* Aug 10 2010; 28(23): 3687-94. PMID 20567019
71. Rosenbaum CE, Verkooijen HM, Lam MG, et al. Radioembolization for treatment of salvage patients with colorectal cancer liver metastases: a systematic review. *J Nucl Med.* Nov 2013; 54(11): 1890-5. PMID 24071510
72. Van Hazel G, Blackwell A, Anderson J, et al. Randomized phase 2 trial of SIR-Spheres plus fluorouracil/leucovorin chemotherapy versus fluorouracil/leucovorin chemotherapy alone in advanced colorectal cancer. *J Surg Oncol.* Nov 01 2004; 88(2): 78-85. PMID 15499601
73. Townsend A, Price T, Karapetis C. Selective internal radiation therapy for liver metastases from colorectal cancer. *Cochrane Database Syst Rev.* Oct 07 2009; 2009(4): CD007045. PMID 19821394
74. Mulcahy MF, Mahvash A, Pracht M, et al. Radioembolization With Chemotherapy for Colorectal Liver Metastases: A Randomized, Open-Label, International, Multicenter, Phase III Trial. *J Clin Oncol.* Dec 10 2021; 39(35): 3897-3907. PMID 34541864
75. van Hazel GA, Heinemann V, Sharma NK, et al. SIRFLOX: Randomized Phase III Trial Comparing First-Line mFOLFOX6 (Plus or Minus Bevacizumab) Versus mFOLFOX6 (Plus or Minus Bevacizumab) Plus Selective Internal Radiation Therapy in Patients With Metastatic Colorectal Cancer. *J Clin Oncol.* May 20 2016; 34(15): 1723-31. PMID 26903575
76. Wasan HS, Gibbs P, Sharma NK, et al. First-line selective internal radiotherapy plus chemotherapy versus chemotherapy alone in patients with liver metastases from colorectal cancer (FOXFIRE, SIRFLOX, and FOXFIRE-Global): a combined analysis of three multicentre, randomized, phase 3 trials. *Lancet Oncol.* Sep 2017; 18(9): 1159-1171. PMID 28781171

©2024 Blue Cross and Blue Shield of Louisiana

Blue Cross and Blue Shield of Louisiana is an independent licensee of the Blue Cross and Blue Shield Association and incorporated as Louisiana Health Service & Indemnity Company.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without permission from Blue Cross and Blue Shield of Louisiana.



Radioembolization for Primary and Metastatic Tumors of the Liver

Policy # 00110

Original Effective Date: 02/23/2004

Current Effective Date: 05/13/2024

77. Wolstenholme J, Fusco F, Gray AM, et al. Quality of life in the FOXFIRE, SIRFLOX and FOXFIRE-global randomized trials of selective internal radiotherapy for metastatic colorectal cancer. *Int J Cancer*. Aug 15 2020; 147(4): 1078-1085. PMID 31840815
78. Carr BI, Kondragunta V, Buch SC, et al. Therapeutic equivalence in survival for hepatic arterial chemoembolization and yttrium 90 microsphere treatments in unresectable hepatocellular carcinoma: a two-cohort study. *Cancer*. Mar 01 2010; 116(5): 1305-14. PMID 20066715
79. Salem R, Lewandowski RJ, Mulcahy MF, et al. Radioembolization for hepatocellular carcinoma using Yttrium-90 microspheres: a comprehensive report of long-term outcomes. *Gastroenterology*. Jan 2010; 138(1): 52-64. PMID 19766639
80. Mokkarala M, Noda C, Malone C, et al. Comparison of Response and Outcomes of Drug-eluting Bead Chemoembolization (DEB-TACE) Versus Radioembolization (TARE) for Patients With Colorectal Cancer Liver Metastases. *Anticancer Res*. Jun 2019; 39(6): 3071-3077. PMID 31177151
81. Seidensticker R, Denecke T, Kraus P, et al. Matched-pair comparison of radioembolization plus best supportive care versus best supportive care alone for chemotherapy refractory liver-dominant colorectal metastases. *Cardiovasc Intervent Radiol*. Oct 2012; 35(5): 1066-73. PMID 21800231
82. Kennedy AS, Salem R. Radioembolization (yttrium-90 microspheres) for primary and metastatic hepatic malignancies. *Cancer J*. 2010; 16(2): 163-75. PMID 20404614
83. Liu C, Tadros G, Smith Q, et al. Selective internal radiation therapy of metastatic breast cancer to the liver: A meta-analysis. *Front Oncol*. 2022; 12: 887653. PMID 36505832
84. Aarts BM, Muñoz FMG, Wildiers H, et al. Intra-Arterial Therapies for Liver Metastatic Breast Cancer: A Systematic Review and Meta-Analysis. *Cardiovasc Intervent Radiol*. Dec 2021; 44(12): 1868-1882. PMID 34322751
85. Feretis M, Solodkyy A. Yttrium-90 radioembolization for unresectable hepatic metastases of breast cancer: A systematic review. *World J Gastrointest Oncol*. Feb 15 2020; 12(2): 228-236. PMID 32104553
86. Ridouani F, Soliman MM, England RW, et al. Relationship of radiation dose to efficacy of radioembolization of liver metastasis from breast cancer. *Eur J Radiol*. Mar 2021; 136: 109539. PMID 33476965
87. Davisson NA, Bercu ZL, Friend SC, et al. Predictors of Survival after Yttrium-90 Radioembolization of Chemotherapy-Refractory Hepatic Metastases from Breast Cancer. *J Vasc Interv Radiol*. Jun 2020; 31(6): 925-933. PMID 32307310

©2024 Blue Cross and Blue Shield of Louisiana

Blue Cross and Blue Shield of Louisiana is an independent licensee of the Blue Cross and Blue Shield Association and incorporated as Louisiana Health Service & Indemnity Company.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without permission from Blue Cross and Blue Shield of Louisiana.



Radioembolization for Primary and Metastatic Tumors of the Liver

Policy # 00110

Original Effective Date: 02/23/2004

Current Effective Date: 05/13/2024

88. Alexander H, Wen D, Chu M, et al. Selective internal radiation therapy for hepatic metastases of uveal melanoma: a systematic review. *Br J Radiol.* Jan 01 2022; 95(1129): 20210200. PMID 34757824
89. Rowcroft A, Loveday BPT, Thomson BNJ, et al. Systematic review of liver directed therapy for uveal melanoma hepatic metastases. *HPB (Oxford).* Apr 2020; 22(4): 497-505. PMID 31791894
90. Gonsalves CF, Eschelman DJ, Adamo RD, et al. A Prospective Phase II Trial of Radioembolization for Treatment of Uveal Melanoma Hepatic Metastasis. *Radiology.* Oct 2019; 293(1): 223-231. PMID 31453767
91. Xing M, Prajapati HJ, Dhanasekaran R, et al. Selective Internal Yttrium-90 Radioembolization Therapy (90Y-SIRT) Versus Best Supportive Care in Patients With Unresectable Metastatic Melanoma to the Liver Refractory to Systemic Therapy: Safety and Efficacy Cohort Study. *Am J Clin Oncol.* Feb 2017; 40(1): 27-34. PMID 25089529
92. Eldredge-Hindy H, Ohri N, Anne PR, et al. Yttrium-90 Microsphere Brachytherapy for Liver Metastases From Uveal Melanoma: Clinical Outcomes and the Predictive Value of Fluorodeoxyglucose Positron Emission Tomography. *Am J Clin Oncol.* Apr 2016; 39(2): 189-95. PMID 24441583
93. Gonsalves CF, Eschelman DJ, Sullivan KL, et al. Radioembolization as salvage therapy for hepatic metastasis of uveal melanoma: a single-institution experience. *AJR Am J Roentgenol.* Feb 2011; 196(2): 468-73. PMID 21257902
94. Kennedy AS, Nutting C, Jakobs T, et al. A first report of radioembolization for hepatic metastases from ocular melanoma. *Cancer Invest.* Jul 2009; 27(6): 682-90. PMID 19219675
95. Klingenstein A, Haug AR, Zech CJ, et al. Radioembolization as locoregional therapy of hepatic metastases in uveal melanoma patients. *Cardiovasc Intervent Radiol.* Feb 2013; 36(1): 158-65. PMID 22526099
96. Piduru SM, Schuster DM, Barron BJ, et al. Prognostic value of 18f-fluorodeoxyglucose positron emission tomography-computed tomography in predicting survival in patients with unresectable metastatic melanoma to the liver undergoing yttrium-90 radioembolization. *J Vasc Interv Radiol.* Jul 2012; 23(7): 943-8. PMID 22609292
97. Ruohoniemi DM, Zhan C, Wei J, et al. Safety and Effectiveness of Yttrium-90 Radioembolization around the Time of Immune Checkpoint Inhibitors for Unresectable Hepatic Metastases. *J Vasc Interv Radiol.* Aug 2020; 31(8): 1233-1241. PMID 32741550
98. Michl M, Haug AR, Jakobs TF, et al. Radioembolization with Yttrium-90 microspheres (SIRT) in pancreatic cancer patients with liver metastases: efficacy, safety and prognostic factors. *Oncology.* 2014; 86(1): 24-32. PMID 24401529

©2024 Blue Cross and Blue Shield of Louisiana

Blue Cross and Blue Shield of Louisiana is an independent licensee of the Blue Cross and Blue Shield Association and incorporated as Louisiana Health Service & Indemnity Company.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without permission from Blue Cross and Blue Shield of Louisiana.



Radioembolization for Primary and Metastatic Tumors of the Liver

Policy # 00110

Original Effective Date: 02/23/2004

Current Effective Date: 05/13/2024

99. Miller MD, Sze DY, Padia SA, et al. Response and Overall Survival for Yttrium-90 Radioembolization of Hepatic Sarcoma: A Multicenter Retrospective Study. *J Vasc Interv Radiol*. Jun 2018; 29(6): 867-873. PMID 29724518
100. Hong K, Akinwande O, Bodei L, et al. ACR-ABS-ACNM-ASTRO-SIR-SNMMI practice parameter for selective internal radiation therapy or radioembolization for treatment of liver malignancies. *Brachytherapy*. 2021; 20(3): 497-511. PMID 33824051
101. Morris VK, Kennedy EB, Baxter NN, et al. Treatment of Metastatic Colorectal Cancer: ASCO Guideline. *J Clin Oncol*. Jan 20 2023; 41(3): 678-700. PMID 36252154
102. National Comprehensive Cancer Network (NCCN). NCCN Clinical Practice Guidelines in Oncology: Neuroendocrine and Adrenal Tumors. Version 2.2022. https://www.nccn.org/professionals/physician_gls/PDF/neuroendocrine.pdf.
103. National Comprehensive Cancer Network (NCCN). NCCN Clinical Practice Guidelines in Oncology. Colon Cancer. Version 2.2023. https://www.nccn.org/professionals/physician_gls/pdf/colon.pdf.
104. National Comprehensive Cancer Network. Melanoma: Uveal. Version 1.2023. https://www.nccn.org/professionals/physician_gls/pdf/uveal.pdf.
105. National Institute for Health and Care Excellence. Selective internal radiation therapy for primary hepatocellular carcinoma Interventional procedures guidance [IPG460]. July, 2013. <https://www.nice.org.uk/guidance/ipg460>.
106. National Institute for Health and Care Excellence. Selective internal radiation therapies for treating hepatocellular carcinoma. Technology appraisal guidance [TA688]. March 2021. <https://www.nice.org.uk/guidance/ta688>.
107. National Institute for Health and Care Excellence. Selective internal radiation therapy for unresectable primary intrahepatic cholangiocarcinoma Interventional procedures guidance [IPG630]. October, 2018. <https://www.nice.org.uk/guidance/ipg630>.
108. National Institute for Health and Care Excellence. Selective internal radiation therapy for unresectable colorectal metastases in the liver Interventional procedures guidance [IPG672]. March 2020. <https://www.nice.org.uk/guidance/ipg672>.

Policy History

Original Effective Date: 02/23/2004

Current Effective Date: 05/13/2024

01/31/2004 Medical Director review.

©2024 Blue Cross and Blue Shield of Louisiana

Blue Cross and Blue Shield of Louisiana is an independent licensee of the Blue Cross and Blue Shield Association and incorporated as Louisiana Health Service & Indemnity Company.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without permission from Blue Cross and Blue Shield of Louisiana.



Radioembolization for Primary and Metastatic Tumors of the Liver

Policy # 00110

Original Effective Date: 02/23/2004

Current Effective Date: 05/13/2024

02/17/2004	Medical Policy Committee review.
02/23/2004	Managed Care Advisory Council approval.
02/01/2006	Medical Director review
02/15/2006	Medical Policy Committee review. Format revisions, Rationale/Source.
02/23/2006	Quality Care Advisory Council approval.
07/07/2006	Format revision, including addition of FDA and or other governmental regulatory approval and rationale/source. Coverage eligibility unchanged.
03/14/2007	Medical Director review.
03/21/2007	Medical Policy Committee approval. Coverage eligibility unchanged.
04/02/2009	Medical Director review.
04/15/2009	Medical Policy Committee approval. Added “(SIRT)” to title. Revised investigational statement from “Based on review of available data, the Company considers the use of internal radiation therapy for all indications including, but not limited to, the treatment of primary or metastatic tumors of the liver, to be investigational*” to “Based on review of available data, the Company considers selective internal radiation therapy using intra-arterial injection of radiolabeled microspheres to treat primary or metastatic liver tumors to be investigational.*” Coverage eligibility unchanged.
09/09/2010	Medical Policy Committee review.
09/15/2010	Medical Policy Implementation Committee approval. policy statement and title (“selective internal radiation therapy” changed to “radioembolization”). Policy statements changed to indicate that selective cases of hepatocellular carcinoma and metastatic neuroendocrine tumors may be considered medically necessary. Title changed to reflect current procedure name.
04/07/2011	Medical Policy Committee review.
04/13/2011	Medical Policy Implementation Committee approval. Added that “radioembolization to treat unresectable hepatic metastases from colorectal cancer that are both progressive and diffuse, in patients with liver-dominant disease who are refractory to chemotherapy or are not candidates for chemotherapy is eligible for coverage.
04/05/2012	Medical Policy Committee review.
04/18/2012	Medical Policy Implementation Committee approval. Coverage eligibility unchanged.
10/11/2012	Medical Policy Committee review.

©2024 Blue Cross and Blue Shield of Louisiana

Blue Cross and Blue Shield of Louisiana is an independent licensee of the Blue Cross and Blue Shield Association and incorporated as Louisiana Health Service & Indemnity Company.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without permission from Blue Cross and Blue Shield of Louisiana.



Radioembolization for Primary and Metastatic Tumors of the Liver

Policy # 00110

Original Effective Date: 02/23/2004

Current Effective Date: 05/13/2024

10/31/2012	Medical Policy Implementation Committee approval. Investigational statement for unresectable hepatic metastases from colorectal carcinoma removed, since it is eligible for coverage.
10/03/2013	Medical Policy Committee review
10/16/2013	Medical Policy Implementation Committee approval. New investigational statement on intrahepatic cholangiocarcinoma added.
03/25/2014	Coding update due to codes added and deleted from policy
11/06/2014	Medical Policy Committee review
11/21/2014	Medical Policy Implementation Committee approval, Added "Based on review of available data, the Company considers radioembolization for all other indications not described as above to be investigational."
08/03/2015	Coding update: ICD10 Diagnosis code section added; ICD9 Procedure code section removed.
10/29/2015	Medical Policy Committee review
11/16/2015	Medical Policy Implementation Committee approval. Melanoma (ocular or cutaneous), or breast cancer added to eligibility statement for unresectable hepatic metastases.
11/03/2016	Medical Policy Committee review
11/16/2016	Medical Policy Implementation Committee approval. Medically necessary statements added for unresectable metastatic breast cancer and melanoma with liver-dominant disease and unresectable intrahepatic cholangiocarcinoma.
01/01/2017	Coding update: Removing ICD-9 Diagnosis Codes
11/02/2017	Medical Policy Committee review
11/15/2017	Medical Policy Implementation Committee approval. No change to coverage.
11/08/2018	Medical Policy Committee review
11/21/2018	Medical Policy Implementation Committee approval. No change to coverage.
11/07/2019	Medical Policy Committee review
11/13/2019	Medical Policy Implementation Committee approval. Coverage eligibility unchanged.
04/02/2020	Medical Policy Committee review
04/08/2020	Medical Policy Implementation Committee approval. Coverage eligibility unchanged.
04/01/2021	Medical Policy Committee review

©2024 Blue Cross and Blue Shield of Louisiana

Blue Cross and Blue Shield of Louisiana is an independent licensee of the Blue Cross and Blue Shield Association and incorporated as Louisiana Health Service & Indemnity Company.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without permission from Blue Cross and Blue Shield of Louisiana.



Radioembolization for Primary and Metastatic Tumors of the Liver

Policy # 00110

Original Effective Date: 02/23/2004

Current Effective Date: 05/13/2024

04/14/2021 Medical Policy Implementation Committee approval. Coverage eligibility unchanged.

04/07/2022 Medical Policy Committee review

04/13/2022 Medical Policy Implementation Committee approval. Coverage eligibility unchanged.

04/06/2023 Medical Policy Committee review

04/12/2023 Medical Policy Implementation Committee approval. Coverage eligibility unchanged.

03/28/2024 Coding update

04/04/2024 Medical Policy Committee review

04/10/2024 Medical Policy Implementation Committee approval. Patients changed to individuals.

03/25/2025 Coding update

Next Scheduled Review Date: 04/2025

Coding

The five character codes included in the Blue Cross Blue Shield of Louisiana Medical Policy Coverage Guidelines are obtained from Current Procedural Terminology (CPT®)†, copyright 2023 by the American Medical Association (AMA). CPT is developed by the AMA as a listing of descriptive terms and five character identifying codes and modifiers for reporting medical services and procedures performed by physician.

The responsibility for the content of Blue Cross Blue Shield of Louisiana Medical Policy Coverage Guidelines is with Blue Cross and Blue Shield of Louisiana and no endorsement by the AMA is intended or should be implied. The AMA disclaims responsibility for any consequences or liability attributable or related to any use, nonuse or interpretation of information contained in Blue Cross Blue Shield of Louisiana Medical Policy Coverage Guidelines. Fee schedules, relative value units, conversion factors and/or related components are not assigned by the AMA, are not part of CPT, and the AMA is not recommending their use. The AMA does not directly or indirectly practice medicine or dispense medical services. The AMA assumes no liability for data contained or not contained herein. Any use of CPT outside of Blue Cross Blue Shield of Louisiana Medical Policy

©2024 Blue Cross and Blue Shield of Louisiana

Blue Cross and Blue Shield of Louisiana is an independent licensee of the Blue Cross and Blue Shield Association and incorporated as Louisiana Health Service & Indemnity Company.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without permission from Blue Cross and Blue Shield of Louisiana.



Radioembolization for Primary and Metastatic Tumors of the Liver

Policy # 00110

Original Effective Date: 02/23/2004

Current Effective Date: 05/13/2024

Coverage Guidelines should refer to the most current Current Procedural Terminology which contains the complete and most current listing of CPT codes and descriptive terms. Applicable FARS/DFARS apply.

CPT is a registered trademark of the American Medical Association.

Codes used to identify services associated with this policy may include (but may not be limited to) the following:

Code Type	Code
CPT	37243, 75894, 77399, 77778, 79445
HCPCS	A9543, C2616, C9797, S2095 Add code effective 04/01/2025: C8004
ICD-10 Diagnosis	All related diagnoses

*Investigational – A medical treatment, procedure, drug, device, or biological product is Investigational if the effectiveness has not been clearly tested and it has not been incorporated into standard medical practice. Any determination we make that a medical treatment, procedure, drug, device, or biological product is Investigational will be based on a consideration of the following:

- A. Whether the medical treatment, procedure, drug, device, or biological product can be lawfully marketed without approval of the U.S. Food and Drug Administration (FDA) and whether such approval has been granted at the time the medical treatment, procedure, drug, device, or biological product is sought to be furnished; or
- B. Whether the medical treatment, procedure, drug, device, or biological product requires further studies or clinical trials to determine its maximum tolerated dose, toxicity, safety, effectiveness, or effectiveness as compared with the standard means of treatment or diagnosis, must improve health outcomes, according to the consensus of opinion among experts as shown by reliable evidence, including:
 1. Consultation with technology evaluation center(s);
 2. Credible scientific evidence published in peer-reviewed medical literature generally recognized by the relevant medical community; or
 3. Reference to federal regulations.

©2024 Blue Cross and Blue Shield of Louisiana

Blue Cross and Blue Shield of Louisiana is an independent licensee of the Blue Cross and Blue Shield Association and incorporated as Louisiana Health Service & Indemnity Company.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without permission from Blue Cross and Blue Shield of Louisiana.



Radioembolization for Primary and Metastatic Tumors of the Liver

Policy # 00110

Original Effective Date: 02/23/2004

Current Effective Date: 05/13/2024

****Medically Necessary (or “Medical Necessity”)** - Health care services, treatment, procedures, equipment, drugs, devices, items or supplies that a Provider, exercising prudent clinical judgment, would provide to a patient for the purpose of preventing, evaluating, diagnosing or treating an illness, injury, disease or its symptoms, and that are:

- A. In accordance with nationally accepted standards of medical practice;
- B. Clinically appropriate, in terms of type, frequency, extent, level of care, site and duration, and considered effective for the patient's illness, injury or disease; and
- C. Not primarily for the personal comfort or convenience of the patient, physician or other health care provider, and 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 that patient's illness, injury or disease.

For these purposes, “nationally accepted standards of medical practice” means standards that are based on credible scientific evidence published in peer-reviewed medical literature generally recognized by the relevant medical community, Physician Specialty Society recommendations and the views of Physicians practicing in relevant clinical areas and any other relevant factors.

‡ Indicated trademarks are the registered trademarks of their respective owners.

NOTICE: If the Patient’s health insurance contract contains language that differs from the BCBSLA Medical Policy definition noted above, the definition in the health insurance contract will be relied upon for specific coverage determinations.

NOTICE: Medical Policies are scientific based opinions, provided solely for coverage and informational purposes. Medical Policies should not be construed to suggest that the Company recommends, advocates, requires, encourages, or discourages any particular treatment, procedure, or service, or any particular course of treatment, procedure, or service.

NOTICE: Federal and State law, as well as contract language, including definitions and specific contract provisions/exclusions, take precedence over Medical Policy and must be considered first in determining eligibility for coverage.

©2024 Blue Cross and Blue Shield of Louisiana

Blue Cross and Blue Shield of Louisiana is an independent licensee of the Blue Cross and Blue Shield Association and incorporated as Louisiana Health Service & Indemnity Company.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without permission from Blue Cross and Blue Shield of Louisiana.