**Radiofrequency Ablation of Primary or Metastatic Liver Tumors**

<table>
<thead>
<tr>
<th>Medical Benefit</th>
<th>Effective Date: 01/01/15</th>
<th>Next Review Date: 09/18</th>
</tr>
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<tbody>
<tr>
<td>Preauthorization</td>
<td>No</td>
<td>Review Dates: 11/07, 11/08, 09/09, 09/10, 09/11, 09/12, 09/13, 09/14, 09/15, 09/16, 09/17</td>
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*Preauthorization is not required.*

The following protocol contains medical necessity criteria that apply for this service. The criteria are also applicable to services provided in the local Medicare Advantage operating area for those members, unless separate Medicare Advantage criteria are indicated. If the criteria are not met, reimbursement will be denied and the patient cannot be billed. Please note that payment for covered services is subject to eligibility and the limitations noted in the patient’s contract at the time the services are rendered.

<table>
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<th>Populations</th>
<th>Interventions</th>
<th>Comparators</th>
<th>Outcomes</th>
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<tr>
<td>Individuals: • With primary, unresectable hepatocellular carcinoma</td>
<td>Interventions of interest are: • Radiofrequency ablation</td>
<td>Comparators of interest are: • Systemic therapy • Other locally ablative techniques</td>
<td>Relevant outcomes include: • Overall survival • Disease-specific survival • Change in disease status • Morbid events • Hospitalizations • Treatment-related morbidity</td>
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<tr>
<td>Individuals: • With unresectable hepatocellular carcinoma awaiting liver transplant</td>
<td>Interventions of interest are: • Radiofrequency ablation</td>
<td>Comparators of interest are: • Other locoregional therapies</td>
<td>Relevant outcomes include: • Overall survival • Disease-specific survival • Change in disease status</td>
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<tr>
<td>Individuals: • With unresectable hepatic metastases of colorectal or neuroendocrine origin</td>
<td>Interventions of interest are: • Radiofrequency ablation</td>
<td>Comparators of interest are: • Chemotherapy • Other locally ablative techniques • Best supportive care</td>
<td>Relevant outcomes include: • Overall survival • Disease-specific survival • Symptoms • Change in disease status • Morbid events • Quality of life • Treatment-related morbidity</td>
</tr>
<tr>
<td>Individuals: • With unresectable hepatic metastases other than colorectal or neuroendocrine origin</td>
<td>Interventions of interest are: • Radiofrequency ablation</td>
<td>Comparators of interest are: • Chemotherapy • Other locally ablative techniques • Other therapy • Best supportive care</td>
<td>Relevant outcomes include: • Overall survival • Disease-specific survival • Symptoms • Change in disease status • Morbid events • Quality of life • Treatment-related morbidity</td>
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**Description**

Radiofrequency ablation (RFA) is a procedure in which a probe is inserted into the center of a tumor and heated...
locally by a high frequency, alternating current that flows from electrodes. The local heat treats the tissue adjacent to the probe, resulting in a three to five cm sphere of dead tissue. The cells killed by RFA are not removed but are gradually replaced by fibrosis and scar tissue. If there is local recurrence, it occurs at the edge and, in some cases, may be retreated. RFA may be performed percutaneously, laparoscopically, or as an open procedure.

Summary of Evidence

For individuals who have primary, unresectable hepatocellular carcinoma (HCC) who receive RFA, the evidence includes randomized trials and several systematic reviews and meta-analyses. Relevant outcomes are overall survival, disease-specific survival, change in disease status, morbid events, hospitalizations, and treatment-related morbidity. Surgical resection of HCC, compared with RFA, has shown superior survival, supporting the use of RFA for unresectable HCC and for those who are not candidates for surgical resection. Response rates have demonstrated that, in patients with small foci of HCC (three or fewer lesions), RFA appears to be better than ethanol injection in achieving complete ablation and preventing local recurrence. Three-year survival rates of 80% have been reported. The evidence is sufficient to determine qualitatively that the technology results in a meaningful improvement in the net health outcome.

For individuals who have unresectable HCC awaiting liver transplant who receive RFA, the evidence includes small case series. Relevant outcomes are overall survival, disease-specific survival, and change in disease status. A number of approaches are used in this patient population, including RFA and other locoregional therapies, particularly transarterial chemoembolization. Locoregional therapy has reduced the dropout rate of patients with HCC awaiting a liver transplant. The evidence is sufficient to determine qualitatively that the technology results in a meaningful improvement in the net health outcome.

For individuals who have unresectable hepatic metastases of colorectal or neuroendocrine origin who receive RFA, the evidence includes systematic reviews and meta-analyses, prospective cohort series, and retrospective case series. Relevant outcomes are overall survival, disease-specific survival, symptoms, change in disease status, morbid events, quality of life, and treatment-related morbidity. Two prospective studies have demonstrated that overall survival following RFA is at least equivalent and likely better than that for currently accepted systemic chemotherapy in well-matched patients with unresectable hepatic metastatic colorectal cancer (CRC) who do not have extrahepatic disease, and results from a number of uncontrolled case series also have suggested RFA of hepatic CRC metastases produces long-term survival that is at minimum equivalent but likely superior to historical outcomes achieved with systemic chemotherapy. Evidence from one comparative study has indicated RFA has fewer deleterious effects on quality of life than chemotherapy and that RFA patients recover quality of life significantly faster than chemotherapy recipients. It should be noted, however, that patients treated with RFA in different series may have had better prognoses than those who underwent chemotherapy, suggesting patient selection bias may at least partially explain the apparent better outcomes observed following RFA. Durable tumor and symptom control of neuroendocrine liver metastases can be achieved by RFA in individuals whose symptoms are not controlled by systemic therapy. The evidence is sufficient to determine qualitatively that the technology results in a meaningful improvement in the net health outcome.

For individuals who have unresectable hepatic metastases other than colorectal or neuroendocrine origin who receive RFA, the evidence includes small case series. Relevant outcomes are overall survival, disease-specific survival, symptoms, change in disease status, morbid events, quality of life, and treatment-related morbidity. The evidence is insufficient to determine the effects of the technology RFA on health outcomes.

Policy

Radiofrequency ablation of primary hepatocellular carcinoma (HCC) may be considered medically necessary as a...
primary treatment of HCC for patients when there are no more than three nodules and all tumor foci can be adequately treated (see Policy Guidelines).

Radiofrequency ablation of primary HCC is considered medically necessary as a bridge to transplant, where the intent is to prevent further tumor growth and to maintain a patient’s candidacy for liver transplant.

Radiofrequency ablation of primary HCC is considered investigational when there are more than three nodules or when not all sites of tumor foci can be adequately treated.

Radiofrequency ablation of primary HCC is considered investigational when used to downstage (downsize) HCC in patients being considered for liver transplant.

Radiofrequency ablation may be considered medically necessary as a primary treatment of hepatic metastases five cm or less in diameter from colorectal cancer in the absence of extrahepatic metastatic disease when all tumor foci can be adequately treated (see Policy Guidelines).

Radiofrequency ablation may be considered medically necessary as treatment of hepatic metastases from neuroendocrine tumors in patients with symptomatic disease when systemic therapy has failed to control symptoms (see Policy Guidelines).

Radiofrequency ablation for hepatic metastasis is considered investigational:

- for hepatic metastases from colorectal cancer or neuroendocrine tumors that do not meet the criteria above; and
- for hepatic metastases from other types of cancer with the exception of colorectal cancer or neuroendocrine tumors.

Policy Guidelines

Explicit criteria have not been established for RFA of HCC or cancer metastatic to the liver.

For the medically necessary indications noted above for RFA in those with primary HCC and metastatic colorectal or neuroendocrine tumors, patients should not be candidates for curative resections (e.g., due to location of lesion(s) and/or comorbid conditions). Those with HCC should also not be candidates for liver transplantation unless RFA is used as a bridge to transplant.

Candidacy for RFA treatment of HCC is based on several factors that include number of tumor foci (nodules), size of tumor foci, and accessibility. In general, the randomized trials for HCC have included patients with three or fewer hepatic lesions measuring five cm or less (and often three cm or less) using current technology.

Candidacy for RFA treatment of metastatic colorectal cancer is based on several factors that include number of tumor foci, size of tumor foci, and accessibility. In general, published studies with metastatic colorectal cancer have included patients with four to five or fewer hepatic lesions measuring five cm or less using current technology.

Background

Hepatic tumors can arise either as primary liver cancer (hepatocellular cancer) or by metastasis to the liver from other tissues. Local therapy for hepatic metastasis may be indicated when there is no extrahepatic disease, which rarely occurs for patients with primary cancers other than colorectal carcinoma or certain neuroendocrine malignancies. At present, surgical resection with adequate margins or liver transplantation constitutes the only treatments available with demonstrated curative potential. However, most hepatic tumors are unresectable at diagnosis, due either to their anatomic location, size, number of lesions, or underlying liver reserve.
Neuroendocrine tumors are tumors of cells that possess secretory granules and originate from the neuroectoderm. Neuroendocrine cells have roles both in the endocrine system and in the nervous system. They produce and secrete a variety of regulatory hormones, or neuropeptides, which include neurotransmitters and growth factors. Overproduction of the specific neuropeptides produced by the cancerous cells causes various symptoms, depending on the hormone produced. They are rare, with an incidence of two to four per 100,000 per year. Treatment of liver metastases is undertaken to prolong survival and to reduce endocrine-related symptoms and hepatic mass-related symptoms.

RFA has been investigated as a treatment for unresectable hepatic tumors, both as primary treatment and as a bridge to liver transplant. In the latter setting, RFA is being tested to determine whether it can reduce the incidence of tumor progression in patients awaiting transplantation and thus maintain patients’ candidacy for liver ablation, transhepatic arterial chemoembolization, microwave coagulation, percutaneous ethanol injection, and radioembolization (yttrium-90 microspheres).

Note that RFA of extrahepatic tumors is addressed separately in the Radiofrequency Ablation of Miscellaneous Solid Tumors Excluding Liver Tumors Protocol.

**Regulatory Status**

Radiofrequency ablation devices have been cleared for marketing by the U.S. Food and Drug Administration (FDA) through the 510(k) process. FDA product code GEI.

**Related Protocols**

Cryosurgical Ablation of Primary or Metastatic Liver Tumors

Radioembolization for Primary and Metastatic Tumors of the Liver

Radiofrequency Ablation of Miscellaneous Solid Tumors Excluding Liver Tumors

Transcatheter Arterial Chemoembolization to Treat Primary or Metastatic Liver Malignancies

Services that are the subject of a clinical trial do not meet our Technology Assessment Protocol criteria and are considered investigational. *For explanation of experimental and investigational, please refer to the Technology Assessment Protocol.*

It is expected that only appropriate and medically necessary services will be rendered. We reserve the right to conduct prepayment and postpayment reviews to assess the medical appropriateness of the above-referenced procedures. *Some of this protocol may not pertain to the patients you provide care to, as it may relate to products that are not available in your geographic area.*

**References**

We are not responsible for the continuing viability of web site addresses that may be listed in any references below.