MEDICAL POLICY STATEMENT
Georgia D-SNP

Policy Name & Number	Date Effective
Radiofrequency and Microwave Ablation of Tumors-DSNP-MM-1354	05/01/2026
Policy Type	
MEDICAL	

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Table of Contents

A. Subject

Radiofrequency and Microwave Ablation of Tumors

B. Background

Radiofrequency and microwave ablation, both types of thermo-ablation, may be appropriate modalities to treat certain types of tumors. Radiofrequency ablation involves the delivery of high frequency alternating current to induce thermal injury of targeted tissue. Microwave ablation utilizes microwave energy to cause thermal coagulation and tissue necrosis at the targeted site. Evidence for the use of these techniques is constantly evolving based on tumor type, size, and location.

Hepatocellular carcinoma is the most common type of primary liver cancer. Treatment options include surgical excision, hepatic artery infusion chemotherapy, trans-arterial bland or chemoembolization, selective interstitial radiotherapy (Yttrium 90 microspheres), percutaneous ethanol injection, cryoablation, and thermo-ablation. Radiofrequency ablation and microwave ablation have demonstrated comparable results to other treatment options for smaller tumors.

Liver metastases are a common manifestation of many primary cancers. The number, location, size, and patient's general health determine the choice of treatment for liver metastases. While surgical resection with curative intent is ideal, this may not be possible in all patients. Non-surgical ablative techniques may be used for both curative and palliative intent. This includes systemic chemotherapy, targeted therapy, immunotherapy, external beam radiotherapy, cryoablation, thermo-ablation, arterial embolization techniques, and selective internal radiation therapy.

Lung cancer is one of the most common types of cancer as well as a common site of metastases. Since symptoms often do not appear until advanced disease, prognosis can be poor. Common treatments for primary or metastatic cancer in the lung include surgery, chemotherapy, radiotherapy, photodynamic therapy, thermal ablation, immunotherapy, and biological therapy. Treatment selection is based on type, size, position and stage of cancer, and the patient's overall health.

Small renal masses (SRMs) less than 4cm in size suspicious for clinical stage T1a renal cell carcinoma are the most common type of kidney tumor encountered. SRMs are often found incidentally with imaging for unrelated indications. Thermo-ablative techniques like RFA and MWA are gaining greater acceptance in clinical practice due to favorable outcomes observed in initial studies, low incidence of complications, lower cost, and ability to treat patients in the outpatient setting. Potential benefits of these techniques should be balanced against the lack of long-term follow-up data. For larger renal masses (T1b), several ablative procedures may be required to achieve the same results as other treatment techniques.

C. Definitions
- **Tumor Ablation** – Direct application of energy to eradicate or destroy focal tumors. The method of ablation is dependent on the characteristics of the lesion and risk mitigation.
  - **Microwave Ablation (MWA)** – Delivery of high-frequency microwave energy to rapidly agitate water molecules in the target tissue. The energy is converted to heat, which causes tissue necrosis.
  - **Radiofrequency Ablation (RFA)** – Delivery of radio waves to generate heat and induce tissue destruction in the targeted area.

D. Policy

I. Microwave ablation for tumor treatment using an FDA-approved device is considered medically necessary when **ONE** of the following indications are met:
   A. Member has primary or metastatic hepatic (liver) tumor, and **ALL** the following:
      1. The tumor is unresectable due to location of lesion(s), or the member has comorbid condition(s) that are contraindicative to surgery.
      2. The tumor is ≤ 5cm in size, or there are no more than 3 nodules, all of which are ≤ 3cm in size.
      3. Microwave ablation may be used alone or in conjunction with open or minimally invasive resection of other liver tumors. Curative resection of all disease must be the stated goal of therapy.
   B. Member has primary or metastatic lung tumor, and **ALL** the following:
      1. The tumor is unresectable due to location of lesion(s), or the member has comorbid condition(s) that are contraindicative to surgery.
      2. Single tumor is ≤ 3cm in size.
   C. Member has T1 renal cell carcinoma (RCC) and **ONE** of the following:
      1. Renal mass is ≤ 4cm in size and the member is not eligible for surgery or declines surgery.
      2. Renal mass is > 4cm but ≤ 7cm and the member is not eligible for surgery.

II. Microwave ablation is not covered for any other indication, including (but not limited to), the following:
   A. Microwave ablation for any other tumor type is considered experimental and investigational due to a lack of clinical evidence regarding efficacy.
   B. Microwave ablation for tumors larger than 5 cm or more than 3 nodules larger than 3 cm is considered experimental and investigational due to a lack of clinical evidence for efficacy compared to other treatment modalities.

III. Radiofrequency ablation for tumor treatment is considered medically necessary for **ANY** of the following indications (NOTE: updates to MCG take precedence to the below criteria):
   A. Barrett esophagus with dysplasia
   B. bone metastases
   C. hepatocellular carcinoma with **ALL** the following:
      1. Child-Pugh class A or B liver function (score of 9 or less)

2. surgical evaluation indicates at least one of the following:
    a. patient is a candidate for surgical resection following radiofrequency ablation
    b. patient is a candidate for transplant following bridge therapy by radiofrequency ablation
    c. patient is not a surgical candidate (or elects against surgery)
    d. patient is not a transplant candidate
3. tumor has all the following:
    a. location amenable to percutaneous, minimally invasive or open surgical ablation
    b. margins accessible to ablation
    c. not in close proximity to critical structures (eg, major vessels, major bile ducts, diaphragm, other intra-abdominal organs)
    d. single tumor 5cm or smaller in diameter OR no more than 3 tumors, each of which is 3cm or smaller in diameter
4. no portal hypertension

D. kidney tumor with **ALL** the following:
1. clinical stage T1 renal lesion
2. patient is not candidate for or elects against active surveillance
3. patient is not a surgical candidate (or elects against surgery)
4. tumor is not a renal angiomyolipoma

E. liver metastases from colorectal carcinoma with **ALL** the following:
1. patient is not an ideal surgical candidate (or elects against surgery)
2. tumor has all the following:
    a. location amenable to percutaneous or surgical ablation
    b. margins accessible to ablation
    c. not in close proximity to critical structures (eg, major vessels, major bile ducts, diaphragm, other intra-abdominal organs)
    d. single tumor 5cm or smaller in diameter OR no more than 3 tumors, each of which is 3cm or smaller in diameter
3. no extrahepatic disease

F. lung cancer (non-small cell [NSCLC]) with **ALL** the following:
1. patient is not a surgical candidate (or elects against surgery)
2. tumor with **ALL** the following:
    a. less than 3cm in diameter
    b. node negative (stage I)
    c. not in close proximity to major pulmonary vessels or esophagus

G. osteoid osteoma

H. soft tissue sarcoma with **at least ONE** of the following:
1. gastrointestinal stromal tumor with limited progressive disease (ie, appearance of new lesion, increase in tumor size)
2. soft tissue sarcoma of extremity, superficial trunk, or head/neck, as indicated by both:
    a. synchronous stage IV disease

b. need for treatment of tumor bulk limited to single organ that is amenable to local therapy, or palliation of disseminated metastases

I. thyroid cancer with **at least ONE** of the following:
   1. differentiated thyroid carcinoma (eg, follicular, papillary) with **at least ONE** of the following:
      a. distant metastasis or persistent disease not amenable to treatment with radioactive iodine
      b. recurrent disease following treatment of locoregional disease
   2. medullary carcinoma with **at least ONE** of the following:
      a. palliative treatment of symptomatic metastases or progressive disease needed
      b. Patient asymptomatic, with **at least ONE** of the following:
         01. disease metastasis
         02. persistent disease following treatment of locoregional disease
         03. recurrent disease following treatment of locoregional disease

J. thyroid nodules, with **ALL** the following:
   1. compressive symptoms from nodules (eg, cough, dysphagia, foreign body sensation, pain, voice changes)
   2. patient not a surgical candidate (or elects against surgery)

K. uterine leiomyomas with **ALL** the following:
   1. laparoscopic ultrasound-guided procedure planned
   2. leiomyomas documented by imaging study (eg, ultrasound) or hysteroscopy
   3. patient desires uterine conservation or is not a surgical candidate
   4. patient is premenopausal
   5. persistent symptoms (3 months or greater in duration) directly attributed to presence of leiomyomas, as indicated by **at least ONE** of the following:
      a. abnormal uterine bleeding unresponsive to conservative management (eg, hormonal therapy)
      b. bowel dysfunction
      c. dyspareunia
      d. infertility
      e. iron deficiency anemia
      f. pelvic pain or pressure
      g. urinary dysfunction
   6. testing has ruled out other potential causes of symptoms

E. Summary of Evidence

Aarts et al (2023) performed a retrospective analysis on patients with T1a RCC treated with RFA or MWA at 2 referral centers. In 164 patients, 87 RFAs and 101 MWAs were performed for 188 RCCs. Primary efficacy rate was 92% for RFA and 91% for MWA. Residual disease was similar between the two treatment groups (n=7 for RFA, n=9 for MWA), although recurrence rate was lower for MWA compared to RFA (n=2 vs n=7). Complications rates were similar (n=14 for RFA, n=14 for MWA), and there was no difference in local tumor progression-free intervals. The authors concluded that primary

efficacy for ablation of RCC is high for both RFA and MWA, with no difference in efficacy or safety.

McClure et al (2023) performed a systematic review and meta-analysis comparing MWA and cryoablation for the treatment of RCC. The review included English articles published from January 2006 to February 2022 assessing adults with primary RCC who received MWA or cryoablation. Mean tumor size for MWA and cryoablation was 2.74 and 2.69cm, respectively. Ablation time was significantly shorter for MWA than cryoablation (meta-regression weighted mean differences 24.55 minutes, 95% confidence interval (CI) -31.71 – -17.38, $p < 0.0001$), and 1-year local tumor recurrence was significantly lower for MWA compared to cryoablation (odds ratio 0.33, 95% CI 0.10 – 0.93, $p = 0.04$). The study concluded that MWA provided significantly improved 1-year LTR and ablation time compared to cryoablation and was as safe as cryoablation.

Macchi et al (2017) published results of the LUMIRA controlled prospective multi-center randomized trial for non-small-cell lung cancer, where 52 patients with state IV disease were randomized into a RFA group or a MWA group. The technical and clinical success were measured along with survival and complication rates. For RFA group, there was a significant reduction in tumor size only between 6 and 12 months ($p = 0.0014$). For MWA group, there was a significant reduction in tumor size between 6 and 12 months ($p = 0.0003$) and between pre-therapy and 12 months ($p = 0.0215$). There were no significant differences between the groups in terms of survival time ($p = 0.883$), while the pain level in MWA group was significantly less than in RFA group ($1.79 < 3.25$, $p = 0.0043$). The authors concluded both RFA and MWA are appropriate choices in terms of efficacy and safety in the treatment of lung tumors. However, MWA produced less intraprocedural pain and a significant reduction in tumor mass compared to RFA.

Glassberg et al (2019) compared microwave ablation (MWA) with hepatic resection (HR) for the treatment of hepatocellular carcinoma and liver metastases in a systematic review and meta-analysis. While HR is the gold standard for liver cancer treatment, few patients are eligible due to comorbidities or tumor location. The authors identified 1 RCT and 15 observational studies which showed an increased local tumor recurrence with MWA versus HR (risk ratio (RR) = 2.49; $p = 0.016$). and 3-year disease-free survival. In secondary measures, HR provided significantly higher 3- and 5-year overall survival (RR = 0.94; $p = 0.03$ and RR = 0.88; $p = 0.01$, respectively), and 3-year disease-free survival (RR = 0.78; $p = 0.009$). MWA exhibited significantly shorter length of stay (weighted mean difference (WMD) = -6.16 days; $p < 0.001$) and operative time (WMD = - 58.69 min; $p < 0.001$), less intraoperative blood loss (WMD = - 189.09mL; $p = 0.006$), and fewer complications than HR (RR = 0.31; $p < 0.001$). Glassberg et al. concluded that MWA can be an effective and safe alternative to HR in patients that are not amenable to resection.

The Society of Interventional Radiology released a standards of practice on percutaneous ablation of non-small cell lung cancer and metastatic disease of the lungs (Genshaft et al, 2021). Indirect comparisons from systematic reviews and meta-analyses

have found that radiofrequency ablation, cryoablation, and microwave ablation are appropriate for image-guided thermal ablation of lung tumors. The method of ablation should be determined by lesion characteristic and risk mitigation, with discretion left to the operating physician. The Society of Interventional Radiology report that MWA is preferred when tumors are adjacent to the pulmonary vasculature, when patients have a pacemaker, and when pulmonary or pleural hemorrhage is of concern. Genshaft et al. also report that there is insufficient published evidence on use of this technique in tumors larger than 5cm.

The National Comprehensive Cancer Network (NCCN) guidelines for non-small cell lung cancer (2025) recommends image-guided thermal ablation (eg, cryotherapy, microwave, radiofrequency) as an option for selected patients. Image-guided thermal therapy is considered an option for the management of NSCLC lesions smaller than 3cm. There is also evidence to support ablation of tumors in selected patients with state 1A NSCLC, those who present with multiple lung cancers, or those who present with locoregional recurrence of symptomatic local thoracic disease.

The NCCN guidelines for hepatocellular carcinoma (2025) state that ablation alone may be curative in treating tumors no larger than 3cm. In well-selected patients with multiple small tumors, MWA and RFA ablation may also be considered as definitive treatment in the context of a multidisciplinary review. Tumors 3 to 5cm in size may be treated to prolong survival using arterially directed therapies, or with combination of an arterially directed therapy and ablation as long as tumor location is accessible for ablation. Unresectable or inoperable tumors greater than 5cm in size should utilize arterially directed therapy, systemic therapy, or radiation therapy.

The NCCN guidelines for kidney cancer (2026) state that percutaneous ablation, including MWA, is an option for the management of clinical state T1 renal lesions. Percutaneous ablation if recommended for renal masses at most 3cm in size. Percutaneous ablation is an option for clinical T1b masses in select patients not eligible for surgery. Biopsy of lesions is recommended prior to or at the time of ablation for staging purposes. NCCN also notes that percutaneous ablation may require retreatment to achieve the same local oncologic outcomes as conventional surgery.

F. Conditions of Coverage

NA

G. Related Policies/Rules

NA

H. Review/Revision History

	DATE	ACTION
Date Issued	10/12/2022	
Date Revised	09/27/2023	Annual review: updated references, approved at Committee

	08/28/2024 06/18/2025 02/11/2026	Review: updated references, approved at Committee. Review: added indications for Barrett and thyroid nodules, section E, updated references, approved at Committee. Review: expanded Background and Summary of Evidence, added renal MWA indications, approved at Committee.
Date Effective	05/01/2026	
Date Archived		

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Independent medical review – September 2022