

Magnetic Resonance-Guided Focused Ultrasound

Policy # 00180

Original Effective Date: 09/22/2005

Current Effective Date: 01/01/2025

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: Occlusion of Uterine Arteries Using Transcatheter Embolization or Laparoscopic Occlusion is addressed separately in medical policy 00130.

Note: Radiofrequency Ablation of Miscellaneous Solid Tumors Excluding Liver Tumors is addressed separately in medical policy 00175.

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 magnetic resonance–guided high-intensity ultrasound ablation for pain palliation in adult patients with metastatic bone cancer who failed or are not candidates for radiotherapy to be **eligible for coverage.****

Based on review of available data, the Company may consider magnetic resonance-guided high-intensity ultrasound ablation for the treatment of medicine-refractory essential tremors 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 magnetic resonance-guided high-intensity ultrasound ablation to be **investigational*** in all other situations including but not limited to:

- Treatment of uterine fibroids;
- Treatment of other tumors (e.g., brain cancer, prostate cancer, breast cancer, desmoid);
- Treatment of medication-refractory tremor dominant Parkinson disease.

Policy # 00180

Original Effective Date: 09/22/2005

Current Effective Date: 01/01/2025

Background/Overview

Uterine Fibroids

Uterine fibroids are 1 of the most common conditions affecting women in the reproductive years. African American women have a greater lifetime incidence of uterine fibroids compared to other racial groups. Symptoms of uterine fibroids include menorrhagia, pelvic pressure, or pain.

Treatment

Approaches currently available to treat symptomatic uterine fibroids include hysterectomy, abdominal myomectomy, laparoscopic and hysteroscopic myomectomy, hormone therapy, uterine artery embolization, and watchful waiting. Hysterectomy and various myomectomy procedures are considered the criterion standard treatments.

Metastatic Bone Disease

Metastatic bone disease is 1 of the most common causes of cancer pain.

Treatment

Existing treatments include conservative measures (eg, massage, exercise) and pharmacologic agents (eg, analgesics, bisphosphonates, corticosteroids). For patients who do not respond to these treatments, standard care is external-beam radiotherapy. However, a substantial proportion of patients have residual pain after radiotherapy, and there is a need for alternative treatments for these patients.

Essential Tremors

Essential tremor (ET) is the most common movement disorder, with an estimated prevalence of 5% worldwide. Essential tremor most often affects the hands and arms, may affect head and voice, and rarely includes the face, legs, and trunk. Essential tremor is heterogeneous among patients, varying in frequency, amplitude, causes of exacerbation, and association with other neurologic deficits.

Treatment

The neuropathology of ET is uncertain, with some evidence suggesting that ET is localized in the brainstem and cerebellum. If patients with ET experience intermittent or persistent disability due to the tremors, initial therapy is with drugs (beta-blockers or anticonvulsants). For medicine-refractory patients, surgery (deep brain stimulation or thalamotomy) may be offered, though high rates of adverse events have been observed.

Tremor-Dominant Parkinson Disease

The 3 cardinal features of Parkinson disease (PD) are tremor, bradykinesia, and rigidity. The tremor in PD is a resting tremor that occurs when the body part is not engaged in purposeful activities. Major subtypes of PD include tremor-dominant, akinetic-rigid, and postural instability and gait difficulty. The progression of PD is highly variable and patients can change subtypes as the disease progresses.



Magnetic Resonance-Guided Focused Ultrasound

Policy # 00180

Original Effective Date: 09/22/2005

Current Effective Date: 01/01/2025

Treatment

Dopaminergic therapy (ie, levodopa or a dopamine agonist) is the first-line treatment for PD, which improves tremor. Amantadine and anticholinergics (eg, trihexyphenidyl) can also be considered as initial treatment for tremor-dominant PD or as add-on therapy in patients who have persistent tremor despite dopaminergic therapy. For medication-refractory patients, surgery (deep brain stimulation or lesioning procedures) may be offered. Lesioning procedures include conventional unilateral thalamotomy and focused ultrasound thalamotomy. Deep brain stimulation is the most frequently performed surgical procedure for the treatment of PD.

Magnetic Resonance-Guided Focused Ultrasound

Magnetic resonance-guided focused ultrasound (MRgFUS) is a noninvasive treatment that combines 2 technologies: focused ultrasound and magnetic resonance imaging (MRI). The ultrasound beam penetrates through the soft tissues and, using MRI for guidance and monitoring, the beam can be focused on targeted sites. Ultrasound causes a local increase in temperature in the target tissue, resulting in coagulation necrosis while sparing the surrounding normal structures. Ultrasound waves from each sonication are directed at a focal point that has a maximum focal volume of 20 mm in diameter and 15 mm in height/length. This causes a rapid rise in temperature (ie, to 65°C to 85°C), which is sufficient to ablate tissue at the focal point. In addition to providing guidance, the associated MRI can provide online thermometric imaging, a temperature "map", to confirm the therapeutic effect of the ablation treatment and allow for real-time adjustment of the treatment parameters.

The U.S. Food and Drug Administration (FDA) approved the ExAblate^{®†} MRgFUS system (InSightec) for 4 indications: treatment of uterine fibroids (leiomyomata), palliation of pain associated with tumors metastatic to bone, medication refractory ET, and tremor-dominant PD. The ultrasound equipment is specifically designed to be compatible with magnetic resonance magnets, and it is integrated into standard clinical MRI units; it also includes a patient table, which has a cradle that houses the focused ultrasound transducer in water or a light oil bath. Some models have a detachable cradle; only certain cradle types can be used for palliation of pain associated with metastatic bone cancer. For treating pain associated with bone metastases, the aim of MRgFUS is to destroy nerves in the bone surface surrounding the tumor.

MRgFUS is also being investigated for the treatment of other tumors, including breast, prostate, brain, and desmoid tumors as well as nonspinal osteoid osteoma.

FDA or Other Governmental Regulatory Approval

U.S. Food and Drug Administration (FDA)

In October 2004, the ExAblate 2000 System (InSightec) was approved by the FDA through the premarket approval process for "ablation of uterine fibroid tissue in pre- or perimenopausal women with symptomatic uterine fibroids who desire a uterine sparing procedure." Treatment is indicated for women with a uterine gestational size of fewer than 24 weeks who have completed childbearing. In October 2012, the ExAblate System, Model 2000/2100/2100 VI, was approved by the FDA through the premarket approval process for pain palliation in adults with metastatic bone cancer who have failed or are not candidates for radiotherapy. The device was evaluated through an expedited



Magnetic Resonance-Guided Focused Ultrasound

Policy # 00180

Original Effective Date: 09/22/2005

Current Effective Date: 01/01/2025

review process. The FDA required a post approval study with 70 patients to evaluate the effectiveness of the system under actual clinical conditions.

In July 2016, the FDA approved the use of the ExAblate Neuro System for the treatment of ET in patients who have not responded to medication (beta-blockers or anticonvulsant drugs) through the premarket approval process. In December 2018, the FDA approved the use of the ExAblate Model 4000 (Neuro) for the treatment of tremor-dominant PD with medication-refractory tremor through the premarket approval process.

In November 2021, the FDA approved the use of the Exablate Prostate System for prostate tissue ablation through the premarket approval process.

FDA product codes: NRZ, POH, PLP.

TULSA-PRO[®]‡ received 510(k) clearance from the U.S. FDA in 2019 to market TULSA-PRO[®] for ablation of prostate tissue. TULSA-PRO is a transurethral prostate tissue ablation system that combines real-time MRI guidance with robotically-driven directional thermal ultrasound and closed-loop temperature feedback control software to deliver predictable ablation of whole-gland or partial prostate tissue. System is designed to provide customizable and predictable, incision-free and radiation-free prostate ablation, protecting the urethra and rectum with water cooling. The FDA's clearance was based upon the Ablatherm device as the predicate device. FDA announcement noted the company sponsored international TACT pivotal clinical trial (prospective, multi-center, single-arm, open label study) of 115 patients with organ-confined prostate cancer evaluated at year 1 for safety and efficacy primary endpoints (i.e., incidence of treatment-emergent adverse events and proportion of patients achieving a PSA nadir $\leq 25\%$ of the pre-treatment baseline).

In October 2023, Cordance Medical announced that the FDA granted a breakthrough device designation for its NeuroAccess device. MRgFUS for blood-brain barrier disruption (0947T) to facilitate liquid biopsy is not evaluated in this policy.

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.

An integrated system providing magnetic resonance-guided focused ultrasound (MRgFUS) treatment is proposed as a noninvasive therapy for uterine fibroids and pain palliation of bone metastases. MRgFUS is also being investigated as a treatment of other benign and malignant tumors as well as essential tremors.



Magnetic Resonance-Guided Focused Ultrasound

Policy # 00180

Original Effective Date: 09/22/2005

Current Effective Date: 01/01/2025

Summary of Evidence

For individuals who have uterine fibroids who receive magnetic resonance-guided focused ultrasound (MRgFUS), the evidence includes systematic reviews, 2 randomized controlled trials (RCTs), nonrandomized comparative studies, and case series. Relevant outcomes are symptoms, quality of life, resource utilization, and treatment-related morbidity. One RCT (N=20) has reported some health outcomes but its primary purpose was to determine the feasibility of a larger trial. It did not find statistically significant differences in quality of life outcomes between active and sham treatment groups but it did find lower fibroid volumes after active treatment. This trial did not have an active comparator, the clinical significance of the primary outcome was unclear, and there were no follow-up data beyond 1 year. The second RCT (N=49) had preliminary results at 6 weeks posttreatment, comparing MRgFUS with uterine artery embolization (UAE), and demonstrated that the 2 groups are comparable in medication use and symptom improvement following treatments. Patients in the MRgFUS group reported recovering significantly faster than patients in the uterine artery embolization group, as measured by time to return to work and time to normal activities. Long-term follow-up results reported that there was lower reintervention rate and greater improvement in symptoms after UAE compared to MRgFUS. A 2021 meta-analysis reported that, comparatively, myomectomy had the lowest re-intervention rate of the 3 regimens (myomectomy vs UAE vs MRgFUS) in all time points assessed, while the MRgFUS had the highest re-intervention rate. Long-term data on the treatment effects, recurrence rates, and impact on future fertility and pregnancy are lacking. The evidence is insufficient to determine that the technology results in an improvement in the net health outcome.

For individuals with metastatic bone cancer who have failed or are not candidates for radiotherapy who receive MRgFUS, the evidence includes a sham-controlled randomized trial, a systematic review of RCTs and observational studies, and case series. Relevant outcomes are symptoms, functional outcomes, health status measures, quality of life, and treatment-related morbidity. The RCT found statistically significant improvements after MRgFUS in a composite outcome comprised of a reduction in pain and morphine use, and in pain reduction as a stand-alone outcome. A substantial proportion of patients in the treatment group experienced adverse events but most events were transient and not severe. Pooled efficacy data from a systematic review reported a treatment response to MRgFUS of 79%. The evidence is sufficient to determine that the technology results in an improvement in the net health outcome.

For individuals with other tumors (eg, breast cancer, brain cancer, prostate cancer, desmoid, nonspinal osteoid osteoma) who receive MRgFUS, the evidence includes nonrandomized, uncontrolled phase II trials and several case series. Relevant outcomes are symptoms, health status measures, and treatment-related morbidity. A nonrandomized, uncontrolled phase II trial evaluating MRgFUS for prostate cancer reported a 93% success rate at 5 months and an 86% success rate at 2 years. Another nonrandomized, phase II trial in patients with prostate cancer reported that at 24 months, 88% (78 out of 89) of patients had no evidence of grade group 2 or higher prostate cancer in the treated area. Use of MRgFUS for the treatment of nonspinal osteoid osteoma consists of several larger case series, including a propensity score-matched retrospective study that reported



Magnetic Resonance-Guided Focused Ultrasound

Policy # 00180

Original Effective Date: 09/22/2005

Current Effective Date: 01/01/2025

similar reductions in pain with radiofrequency ablation and MRgFUS. The evidence is insufficient to determine that the technology results in an improvement in the net health outcome.

For individuals with medicine-refractory essential tremors who receive MRgFUS, the evidence includes a technology assessment, meta-analyses, and a double-blind, sham-controlled randomized trial. Relevant outcomes include symptoms, functional outcomes, quality of life, and treatment-related morbidity. The assessment did not pool study results but concluded that, overall, MRgFUS decreased tremor severity and improved quality of life. One meta-analysis reported significant improvements in hand tremor scores from baseline up to 24 months post-treatment, with evidence of a diminishing treatment benefit over time. Another meta-analysis found similar improvements in tremor severity with MRgFUS to unilateral deep brain stimulation (DBS), but improvements in both were inferior to bilateral DBS. The sham-controlled randomized trial found significant improvements in the treatment group in tremor severity, functional improvement, and quality of life after 3 months of follow-up. The improvements in hand tremor score, function, and quality of life were maintained at the 2 year follow-up. The evidence is sufficient to determine that the technology results in an improvement in the net health outcome.

For individuals with medicine-refractory tremor dominant Parkinson disease (PD) who receive MRgFUS, the evidence includes a pilot RCT. Relevant outcomes include symptoms, functional outcomes, quality of life, and treatment-related morbidity. The double-blind, sham-controlled, pilot randomized trial (N=27) found significant improvements in the treatment group in tremor severity after 3 months of follow-up. The evidence is insufficient to determine that the technology results in an improvement in the net health outcome.

Supplemental Information

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

In 2018, the American College of Radiology published appropriateness criteria for the radiological management of uterine leiomyomas (fibroids). The clinical guidance states that "MR [magnetic resonance]-guided high-intensity focused US [ultrasound] (MRgFUS) is another uterine-sparing option to treat focal leiomyomas. It is noninvasive, though each treatment may take several hours to complete. Its use currently is restricted to patients with fewer than six leiomyomas or leiomyoma volume < 900 cm³," and "although a reasonable alternative for patients unable or unwilling to tolerate sedation or anesthesia, long-term data and viability results are still lacking."



Magnetic Resonance-Guided Focused Ultrasound

Policy # 00180

Original Effective Date: 09/22/2005

Current Effective Date: 01/01/2025

These appropriateness criteria were most recently updated in 2023, with evidence summaries provided for each reviewed clinical scenario. Table 1 summarizes the appropriateness category for specific populations with uterine fibroids.

Table 1. ACR Appropriateness Criteria: Management of Uterine Fibroids

Clinical situation	MRgFUS Appropriateness Category ^a
Reproductive age patient with uterine fibroids, symptomatic with heavy uterine bleeding or bulk symptoms (eg, pressure, pain, fullness, bladder, or bowel symptoms), and a desire to preserve fertility. Initial therapy.	Usually appropriate
Reproductive age patient with uterine fibroids, symptomatic with heavy uterine bleeding or bulk symptoms (eg, pressure, pain, fullness, bowel, or bladder symptoms), and no desire for future fertility. Initial therapy.	Usually appropriate
Reproductive age patient with uterine fibroids and concurrent adenomyosis, symptomatic with heavy uterine bleeding or bulk symptoms (eg, pressure, pain, fullness, bladder, or bowel symptoms), and no desire for future fertility. Initial therapy.	Usually not appropriate
Reproductive age patient with pedunculated submucosal uterine fibroids, symptomatic with heavy uterine bleeding. Initial therapy.	May be appropriate
Postmenopausal patient with uterine fibroids, symptomatic with heavy uterine bleeding or bulk symptoms (eg, pressure, pain, fullness, bladder, or bowel symptoms). Negative endometrial biopsy. Next step.	Usually not appropriate
Reproductive age patient with uterine fibroids desiring pregnancy and experiencing reproductive dysfunction. Initial therapy.	May be appropriate

ACR: American College of Radiology; MRgFUS: magnetic resonance-guided focused ultrasound.

^aUsually appropriate: the imaging procedure or treatment is indicated in the specified clinical scenarios at a favorable risk-benefit ratio for patients; May be appropriate: The imaging procedure or treatment may be indicated in the specified clinical scenarios as an alternative to imaging procedures or treatments with a more favorable risk-benefit ratio, or the risk-benefit ratio for patients is equivocal; Usually not appropriate: The imaging procedure or treatment is unlikely to be indicated in the specified clinical scenarios, or the risk-benefit ratio for patients is likely to be unfavorable.

American Society for Radiation Oncology et al

In 2017, the American Society for Radiation Oncology (ASTRO) published guidelines on palliative radiotherapy for bone metastases, which stated that external-beam radiotherapy continues to be the primary therapy for treating painful uncomplicated bone metastases. The guidelines did not mention magnetic resonance-guided focused ultrasound. If patients experience persistent or recurrent pain more than 1 month after initial treatment, the guidelines recommended retreatment with external-beam radiotherapy. As for advanced radiotherapy such as stereotactic body radiotherapy for



Magnetic Resonance-Guided Focused Ultrasound

Policy # 00180

Original Effective Date: 09/22/2005

Current Effective Date: 01/01/2025

retreatment of recurrent pain in spine bone lesions, these "may be feasible, effective, and safe, but the panel recommends that this approach should be limited to clinical trial participation or on a registry given limited data supporting routine use."

In 2022, the American Urological Association (AUA)/ASTRO published guidance on the management of clinically localized prostate cancer. The guidance states that "there is a lack of data to date to support the use of whole gland or focal ablation for the treatment of clinically localized prostate cancer."

National Comprehensive Cancer Network

Guidelines from the National Comprehensive Cancer Network (NCCN) on bone cancer (v.2.2024), breast cancer (v.2.2024), and brain cancer (v.1.2023), do not mention magnetic resonance-guided ultrasound as a treatment option. The NCCN guideline for prostate cancer (v.3.2024) states that "Cryotherapy or other local therapies are not recommended as routine primary therapy for localized prostate cancer due to lack of long-term data comparing these treatments to radiation. At this time, the panel recommends only cryosurgery and high-intensity focused ultrasound (HIFU; category 2B) as local therapy options for RT [radiotherapy] recurrence in the absence of metastatic disease".

National Institute for Health and Care Excellence

Guidance from NICE (2018) on unilateral magnetic resonance-guided ultrasound for treatment-resistant essential tremor states "the evidence on the safety of unilateral MRI [magnetic resonance imaging]-guided focused ultrasound thalamotomy for treatment-resistant essential tremor raises no major safety concerns. However, current evidence on its efficacy is limited in quantity. Therefore, this procedure should not be used unless there are 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 2.

Table 2. Summary of Key Trials

NCT No.	Trial Name	Planned Enrollment	Completion Date
<i>Ongoing</i>			



Magnetic Resonance-Guided Focused Ultrasound

Policy # 00180

Original Effective Date: 09/22/2005

Current Effective Date: 01/01/2025

NCT No.	Trial Name	Planned Enrollment	Completion Date
NCT01473485 ^a	A Study to Evaluate the Safety and Feasibility of Transcranial MRI-Guided Focused Ultrasound Surgery in the Treatment of Brain Tumors	10	Dec 2022
NCT03998657 ^a	A Continued Access Study to Evaluate Focal MR-Guided Focused Ultrasound Treatment of Localized Intermediate Risk Prostate Lesions	14	Dec 2022
NCT02923011	Phase III Study to Compare the Effectiveness of Magnetic Resonance Guided Focused Ultrasound With Computed Tomography Guided Radiofrequency Ablation for Treatment of Osteoid Osteomas	56	Dec 2024
NCT03948789	Multicenter, Randomized Phase III Study of MR-Guided Focused Ultrasound Surgery for the Treatment of Uterine Fibroids (MRgFUS TUF) Compared to Myomectomy in Symptomatic Medication and Not Sufficiently Treatable Uterine Fibroids	127	Jun 2025
NCT03100474 ^a	Global Registry: ExAblate 4000 Transcranial MR Guided Focused Ultrasound (TcMRgFUS) of Neurological Disorders	500	Jan 2024
NCT02252380 ^a	A Feasibility Clinical Trial of the Magnetic Resonance Guided Focused Ultrasound (MRgFUS) for the Management of Treatment-Refractory Movement Disorders	10	Dec 2023
<i>Unpublished</i>			
NCT02260752	Comparing Options for Management: Patient-Centered Results for Uterine Fibroids	3094	Apr 2020
NCT01833806 ^a	A Phase IV Post Approval Clinical Study of ExAblate Treatment of Metastatic Bone Tumors for the Palliation of Pain	32	Jan 2022
NCT01285960 ^a	A Clinical Study to Evaluate Safety of the ExAblate Model 2100 Type 1.1 System in the Treatment of Symptomatic Uterine Fibroids	108	Apr 2016 (completed)



Magnetic Resonance-Guided Focused Ultrasound

Policy # 00180

Original Effective Date: 09/22/2005

Current Effective Date: 01/01/2025

NCT No.	Trial Name	Planned Enrollment	Completion Date
NCT01620359 ^a	Study of ExAblate Focused Ultrasound Ablation of Breast Cancer under MR Guidance and MRI Evaluation of Ablation	14	Jul 2016 (completed)
NCT02794558 ^a	A Clinical Study to Evaluate the Safety and Effectiveness of MR Guided Focused Ultrasound Surgery in the Treatment of Early Breast Carcinomas	100	Mar 2019

NCT: national clinical trial.

^a Denotes industry-sponsored or cosponsored trial.

References

1. Eltoukhi HM, Modi MN, Weston M, et al. The health disparities of uterine fibroid tumors for African American women: a public health issue. *Am J Obstet Gynecol.* Mar 2014; 210(3): 194-9. PMID 23942040
2. Barnard EP, AbdElmagied AM, Vaughan LE, et al. Periprocedural outcomes comparing fibroid embolization and focused ultrasound: a randomized controlled trial and comprehensive cohort analysis. *Am J Obstet Gynecol.* May 2017; 216(5): 500.e1-500.e11. PMID 28063909
3. Laughlin-Tommaso S, Barnard EP, AbdElmagied AM, et al. FIRSST study: randomized controlled trial of uterine artery embolization vs focused ultrasound surgery. *Am J Obstet Gynecol.* Feb 2019; 220(2): 174.e1-174.e13. PMID 30696556
4. Jacoby VL, Kohi MP, Poder L, et al. PROMISe trial: a pilot, randomized, placebo-controlled trial of magnetic resonance guided focused ultrasound for uterine fibroids. *Fertil Steril.* Mar 2016; 105(3): 773-780. PMID 26658133
5. Gizzo S, Saccardi C, Patrelli TS, et al. Magnetic resonance-guided focused ultrasound myomectomy: safety, efficacy, subsequent fertility and quality-of-life improvements, a systematic review. *Reprod Sci.* Apr 2014; 21(4): 465-76. PMID 23868442
6. Xu F, Deng L, Zhang L, et al. The comparison of myomectomy, UAE and MRgFUS in the treatment of uterine fibroids: a meta analysis. *Int J Hyperthermia.* Sep 2021; 38(2): 24-29. PMID 34420449
7. Chen R, Keserci B, Bi H, et al. The safety and effectiveness of volumetric magnetic resonance-guided high-intensity focused ultrasound treatment of symptomatic uterine fibroids: early clinical experience in China. *J Ther Ultrasound.* 2016; 4: 27. PMID 27822376
8. Rabinovici J, David M, Fukunishi H, et al. Pregnancy outcome after magnetic resonance-guided focused ultrasound surgery (MRgFUS) for conservative treatment of uterine fibroids. *Fertil Steril.* Jan 2010; 93(1): 199-209. PMID 19013566
9. Otonkoski S, Sainio T, Mattila S, et al. Magnetic resonance guided high intensity focused ultrasound for uterine fibroids and adenomyosis has no effect on ovarian reserve. *Int J Hyperthermia.* 2023; 40(1): 2154575. PMID 36535925



Magnetic Resonance-Guided Focused Ultrasound

Policy # 00180

Original Effective Date: 09/22/2005

Current Effective Date: 01/01/2025

10. Baal JD, Chen WC, Baal U, et al. Efficacy and safety of magnetic resonance-guided focused ultrasound for the treatment of painful bone metastases: a systematic review and meta-analysis. *Skeletal Radiol.* Dec 2021; 50(12): 2459-2469. PMID 34018007
11. Hurwitz MD, Ghanouni P, Kanaev SV, et al. Magnetic resonance-guided focused ultrasound for patients with painful bone metastases: phase III trial results. *J Natl Cancer Inst.* Apr 23 2014; 106(5). PMID 24760791
12. Arrigoni F, Barile A, Zugaro L, et al. Intra-articular benign bone lesions treated with Magnetic Resonance-guided Focused Ultrasound (MRgFUS): imaging follow-up and clinical results. *Med Oncol.* Apr 2017; 34(4): 55. PMID 28244018
13. Ghai S, Finelli A, Corr K, et al. MRI-guided Focused Ultrasound Ablation for Localized Intermediate-Risk Prostate Cancer: Early Results of a Phase II Trial. *Radiology.* Mar 2021; 298(3): 695-703. PMID 33529137
14. Ghai S, Finelli A, Corr K, et al. MRI-guided Focused Ultrasound Focal Therapy for Intermediate-Risk Prostate Cancer: Final Results from a 2-year Phase II Clinical Trial. *Radiology.* Mar 2024; 310(3): e231473. PMID 38441092
15. Ehdaie B, Tempany CM, Holland F, et al. MRI-guided focused ultrasound focal therapy for patients with intermediate-risk prostate cancer: a phase 2b, multicentre study. *Lancet Oncol.* Jul 2022; 23(7): 910-918. PMID 35714666
16. Zippel DB, Papa MZ. The use of MR imaging guided focused ultrasound in breast cancer patients; a preliminary phase one study and review. *Breast Cancer.* 2005; 12(1): 32-8. PMID 15657521
17. Hynynen K, Pomeroy O, Smith DN, et al. MR imaging-guided focused ultrasound surgery of fibroadenomas in the breast: a feasibility study. *Radiology.* Apr 2001; 219(1): 176-85. PMID 11274554
18. Gianfelice D, Khiat A, Amara M, et al. MR imaging-guided focused US ablation of breast cancer: histopathologic assessment of effectiveness-- initial experience. *Radiology.* Jun 2003; 227(3): 849-55. PMID 12714680
19. Gianfelice D, Khiat A, Amara M, et al. MR imaging-guided focused ultrasound surgery of breast cancer: correlation of dynamic contrast-enhanced MRI with histopathologic findings. *Breast Cancer Res Treat.* Nov 2003; 82(2): 93-101. PMID 14692653
20. Merckel LG, Knuttel FM, Deckers R, et al. First clinical experience with a dedicated MRI-guided high-intensity focused ultrasound system for breast cancer ablation. *Eur Radiol.* Nov 2016; 26(11): 4037-4046. PMID 26852219
21. McDannold N, Clement GT, Black P, et al. Transcranial magnetic resonance imaging-guided focused ultrasound surgery of brain tumors: initial findings in 3 patients. *Neurosurgery.* Feb 2010; 66(2): 323-32; discussion 332. PMID 20087132
22. Arrigoni F, Spiliopoulos S, de Cataldo C, et al. A Bicentric Propensity Score Matched Study Comparing Percutaneous Computed Tomography-Guided Radiofrequency Ablation to Magnetic Resonance-Guided Focused Ultrasound for the Treatment of Osteoid Osteoma. *J Vasc Interv Radiol.* Jul 2021; 32(7): 1044-1051. PMID 33775816
23. Arrigoni F, Napoli A, Bazzocchi A, et al. Magnetic-resonance-guided focused ultrasound treatment of non-spinal osteoid osteoma in children: multicentre experience. *Pediatr Radiol.* Aug 2019; 49(9): 1209-1216. PMID 31129699



Magnetic Resonance-Guided Focused Ultrasound

Policy # 00180

Original Effective Date: 09/22/2005

Current Effective Date: 01/01/2025

24. Geiger D, Napoli A, Conchiglia A, et al. MR-guided focused ultrasound (MRgFUS) ablation for the treatment of nonspinal osteoid osteoma: a prospective multicenter evaluation. *J Bone Joint Surg Am*. May 07 2014; 96(9): 743-51. PMID 24806011
25. Avedian RS, Bitton R, Gold G, et al. Is MR-guided High-intensity Focused Ultrasound a Feasible Treatment Modality for Desmoid Tumors?. *Clin Orthop Relat Res*. Mar 2016; 474(3): 697-704. PMID 26040967
26. Bucknor MD, Rieke V. MRgFUS for desmoid tumors within the thigh: early clinical experiences. *J Ther Ultrasound*. 2017; 5: 4. PMID 28174660
27. Ghanouni P, Dobrotwir A, Bazzocchi A, et al. Magnetic resonance-guided focused ultrasound treatment of extra-abdominal desmoid tumors: a retrospective multicenter study. *Eur Radiol*. Feb 2017; 27(2): 732-740. PMID 27147222
28. Miller WK, Becker KN, Caras AJ, et al. Magnetic resonance-guided focused ultrasound treatment for essential tremor shows sustained efficacy: a meta-analysis. *Neurosurg Rev*. Feb 2022; 45(1): 533-544. PMID 33978922
29. Elias WJ, Lipsman N, Ondo WG, et al. A Randomized Trial of Focused Ultrasound Thalamotomy for Essential Tremor. *N Engl J Med*. Aug 25 2016; 375(8): 730-9. PMID 27557301
30. Giordano M, Caccavella VM, Zaed I, et al. Comparison between deep brain stimulation and magnetic resonance-guided focused ultrasound in the treatment of essential tremor: a systematic review and pooled analysis of functional outcomes. *J Neurol Neurosurg Psychiatry*. Dec 2020; 91(12): 1270-1278. PMID 33055140
31. Schaink A, Li C, Gajic-Veljanoski O, et al. Magnetic Resonance-Guided Focused Ultrasound Neurosurgery for Essential Tremor: A Health Technology Assessment. *Ont Health Technol Assess Ser*. 2018; 18(4): 1-141. PMID 29805721
32. Chang JW, Park CK, Lipsman N, et al. A prospective trial of magnetic resonance-guided focused ultrasound thalamotomy for essential tremor: Results at the 2-year follow-up. *Ann Neurol*. Jan 2018; 83(1): 107-114. PMID 29265546
33. Bond AE, Shah BB, Huss DS, et al. Safety and Efficacy of Focused Ultrasound Thalamotomy for Patients With Medication-Refractory, Tremor-Dominant Parkinson Disease: A Randomized Clinical Trial. *JAMA Neurol*. Dec 01 2017; 74(12): 1412-1418. PMID 29084313
34. Knuttinen MG, Stark G, Hohenwarter EJ, et al. ACR Appropriateness Criteria® Radiologic Management of Uterine Leiomyomas. *J Am Coll Radiol*. May 2018; 15(5S): S160-S170. PMID 29724419
35. American College of Radiology. ACR Appropriateness Criteria: Management of Uterine Fibroids. Updated 2023. <https://acsearch.acr.org/docs/69508/Narrative/>.
36. Lutz S, Balboni T, Jones J, et al. Palliative radiation therapy for bone metastases: Update of an ASTRO Evidence-Based Guideline. *Pract Radiat Oncol*. 2017; 7(1): 4-12. PMID 27663933
37. Eastham JA, Boorjian SA, Kirkby E. Clinically Localized Prostate Cancer: AUA/ASTRO Guideline. *J Urol*. Sep 2022; 208(3): 505-507. PMID 35830561
38. National Comprehensive Cancer Network (NCCN). NCCN Clinical Practice Guidelines in Oncology: Bone Cancer. Version 2.2024. https://www.nccn.org/professionals/physician_gls/pdf/bone.pdf.



Magnetic Resonance-Guided Focused Ultrasound

Policy # 00180

Original Effective Date: 09/22/2005

Current Effective Date: 01/01/2025

39. National Comprehensive Cancer Network (NCCN). NCCN Clinical Practice Guidelines in Oncology: Breast Cancer. Version 2.2024.
https://www.nccn.org/professionals/physician_gls/pdf/breast.pdf.
40. National Comprehensive Cancer Network (NCCN). NCCN Clinical Practice Guidelines in Oncology: Central Nervous System Cancers. Version 1.2023.
https://www.nccn.org/professionals/physician_gls/pdf/cns.pdf.
41. National Comprehensive Cancer Network (NCCN). NCCN Clinical Practice Guidelines in Oncology: Prostate Cancer. Version 3.2024.
https://www.nccn.org/professionals/physician_gls/pdf/prostate.pdf.
42. National Institute of Health and Care Excellence (NICE). Unilateral MRI-guided focused ultrasound thalamotomy for treatment-resistant essential tremor [IPG617]. 2018;
<https://www.nice.org.uk/guidance/ipg617>.

Policy History

Original Effective Date: 09/22/2005

Current Effective Date: 01/01/2025

- | | |
|------------|---|
| 09/07/2005 | Medical Director review |
| 09/20/2005 | Medical Policy Committee review |
| 09/22/2005 | 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. |
| 09/05/2007 | Medical Director review |
| 09/19/2007 | Medical Policy Committee approval. Coverage eligibility unchanged. |
| 09/03/2009 | Medical Policy Committee approval |
| 09/16/2009 | Medical Policy Implementation Committee approval. Coverage eligibility unchanged. |
| 09/09/2010 | Medical Policy Committee review |
| 09/15/2010 | Medical Policy Implementation Committee approval. Added that magnetic resonance imaging (MRI)-guided ablation of other tumors, including but not limited to breast, brain, prostate cancer, and palliative treatment of bone metastases, is considered to be investigational. |
| 09/01/2011 | Medical Policy Committee review |
| 09/14/2011 | Medical Policy Implementation Committee approval. Title changed from “MRI-Guided High Intensity Ultrasound Ablation of Uterine Fibroids” to “MRI-Guided Focused Ultrasound (MRgFUS) for the Treatment of Uterine Fibroids and Other Tumors.” Coverage eligibility unchanged. |
| 10/11/2012 | Medical Policy Committee review |
| 10/31/2012 | Medical Policy Implementation Committee approval |
| 10/03/2013 | Medical Policy Committee review |
| 10/16/2013 | Medical Policy Implementation Committee approval. Policy title changed from “MRI-Guided Focused Ultrasound (MRgFUS) for the Treatment of Uterine Fibroids and Other Tumors” to “MRI-Guided Focused Ultrasound (MRgFUS)”. Policy changed to a single investigational statement with no change to coverage eligibility. |
| 11/06/2014 | Medical Policy Committee review |



Magnetic Resonance-Guided Focused Ultrasound

Policy # 00180

Original Effective Date: 09/22/2005

Current Effective Date: 01/01/2025

11/21/2014 Medical Policy Implementation Committee approval. No change to coverage. Title changed from MRI-Guided Focused Ultrasound (MRgFUS) to Magnetic Resonance Imaging-Guided Focused Ultrasound.

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. Added “Based on review of available data, the Company may consider magnetic resonance imaging (MRI)–guided high-intensity ultrasound ablation for pain palliation in adult patients with metastatic bone cancer who failed or are not candidates for radiotherapy to be eligible for coverage.”

11/03/2016 Medical Policy Committee review

11/16/2016 Medical Policy Implementation Committee approval. Title change, “imaging” removed from policy statements.

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. A policy statement added that MRgFUS ablation may be considered eligible for coverage for the treatment of medicine-refractory essential tremors.

11/07/2019 Medical Policy Committee review

11/13/2019 Medical Policy Implementation Committee approval. No change to coverage.

04/02/2020 Medical Policy Committee review

04/08/2020 Medical Policy Implementation Committee approval. No change to coverage.

04/01/2021 Medical Policy Committee review

04/14/2021 Medical Policy Implementation Committee approval. No change to coverage

12/02/2021 Medical Policy Committee review

12/08/2021 Medical Policy Implementation Committee approval. Investigational statement added on tremor-dominant Parkinson disease to the policy statement.

12/01/2022 Medical Policy Committee review

12/14/2022 Medical Policy Implementation Committee approval. No change to coverage.

12/07/2023 Medical Policy Committee review

12/13/2023 Medical Policy Implementation Committee approval. No change to coverage. FDA updated to include TULSA-PRO. Body of policy updated. References added.

12/05/2024 Medical Policy Committee review

12/11/2024 Medical Policy Implementation Committee approval. FDA section updated. Coverage eligibility unchanged. Coding update effective 01/01/2025.

Next Scheduled Review Date: 12/2025



Magnetic Resonance-Guided Focused Ultrasound

Policy # 00180

Original Effective Date: 09/22/2005

Current Effective Date: 01/01/2025

Coding

The five character codes included in the Louisiana Blue 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 Louisiana Blue Medical Policy Coverage Guidelines is with Louisiana Blue 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 Louisiana Blue 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 Louisiana Blue Medical Policy 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	0071T, 0072T, 55899 Add code effective 01/01/2025: 61715 Delete code effective 01/01/2025: 0398T
HCPCS	C9734
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



Magnetic Resonance-Guided Focused Ultrasound

Policy # 00180

Original Effective Date: 09/22/2005

Current Effective Date: 01/01/2025

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.

****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.

