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POLICY

Laparoscopic and percutaneous techniques of myolysis as a treatment of uterine fibroids are considered investigational.

POLICY GUIDELINES

The following codes might be used for a laparoscopic procedure:
- 58674 Laparoscopy, surgical, ablation of uterine fibroid(s) including intraoperative ultrasound guidance and monitoring, radiofrequency
- 58578 Unlisted laparoscopy procedure, uterus
- 58999 Unlisted procedure, female genital system (nonobstetrical).

For percutaneous procedures, the following code would likely be used to describe the magnetic resonance imaging component of the procedure:
- 77022 Magnetic resonance guidance for, and monitoring of, parenchymal tissue ablation.

For ultrasound guidance, one of the following codes might be used:
- 76940 Ultrasound guidance for and monitoring of, parenchymal tissue ablation
- 76998 Ultrasonic guidance, intraoperative.

In November 2014, the U.S. Food and Drug Administration published a safety communication on laparoscopic power morcellators used for myomectomy and hysterectomy in most women. (Morcellators are not otherwise addressed herein). The Administration recommended that manufacturers of these devices include in their product labels a boxed safety warning and wording on contraindications.
Laparoscopic and Percutaneous Techniques for the Myolysis of Uterine Fibroids


**BENEFIT APPLICATION**

**BLUECARD/NATIONAL ACCOUNT ISSUES**

State or federal mandates (eg, Federal Employee Program) may dictate that certain U.S. Food and Drug Administration–approved devices, drugs, or biologics may not be considered investigational, and thus these devices may be assessed only by their medical necessity.

Some of the lysis procedures are specialized and not widely disseminated; therefore, requests for out-of-network referral may occur.

**BACKGROUND**

**Uterine Fibroids**

Uterine fibroids, also known as leiomyomas, are among the most common conditions affecting women in their reproductive years; symptoms include menorrhagia, pelvic pressure, or pain.

**Treatment**

Surgery, including hysterectomy and various myomectomy procedures, is considered the criterion standard for symptom resolution. However, there is the potential for surgical complications and, in the case of a hysterectomy, the uterus is not preserved. In addition, multiple myomectomies may be associated with longer operating time, postoperative febrile morbidity, and development of pelvic adhesions. There has been long-standing research interest in developing minimally invasive alternatives for treating uterine fibroids, including procedures that retain the uterus and permit future childbearing. Treatment options include uterine artery embolization (see evidence review 4.01.11) and the transcutaneous magnetic resonance imaging-guided focused ultrasound therapy (see evidence review 7.01.109). Various techniques to induce myolysis have also been studied including Nd:YAG lasers, bipolar electrodes, cryomyolysis, and radiofrequency ablation. With these techniques, an energy source is used to create areas of necrosis within uterine fibroids, reducing their volume and thus relieving symptoms. Early methods involved multiple insertions of probes into the fibroid, performed without imaging guidance. There were concerns about serosal injury and abdominopelvic adhesions with these techniques, possibly due to the multiple passes through the serosa needed to treat a single fibroid. Newer systems using radiofrequency energy do not require repetitive insertions of needle electrodes. Ultrasonography is used laparoscopically to determine the size and location of fibroids, to guide the probe, and to ensure the probe is in the correct location so that optimal energy is applied to the fibroid. Percutaneous approaches using magnetic resonance imaging guidance have also been reported.

**Regulatory Status**

In 2012, the Acessa™ System (Acessa Health, formerly Halt Medical) was cleared for marketing by the U.S. Food and Drug Administration (FDA) through the 510(k) process for percutaneous laparoscopic coagulation and ablation of soft tissue and treatment of symptomatic uterine fibroids under laparoscopic ultrasound guidance (K121858). The technology was previously approved in 2010, at which time it was called the Halt 2000GI™ Electrosurgical Radiofrequency Ablation System. In 2014, the ultrasound guidance system received marketing clearance from the FDA (K132744). FDA product code: GEI. In 2018, the third-generation Acessa™ ProVu System® was cleared for marketing by the FDA through the 510(k) process for use in percutaneous, laparoscopic coagulation and ablation of soft tissue,
including treatment of symptomatic uterine fibroids under laparoscopic ultrasound guidance. (K181124). FDA product code: HFG.

Cryoaablation is a surgical procedure that uses previously approved and available cryoaablation systems; and as a surgical procedure, it is not subject to regulation by the FDA. Other products addressed in this review (eg, Nd:YAG lasers, bipolar electrodes) have long-standing FDA approval, and there are no products specifically approved for the treatment of uterine fibroids.

**RATIONALE**

This evidence review was created in July 2004 and has been updated regularly with searches of the MEDLINE database until it was archived in December 2009. In July 2013, the review returned to active status. The most recent literature update was performed through June 16, 2019.

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

To assess whether the evidence is sufficient to draw conclusions about the net health outcome of technology, two domains are examined: the relevance, and quality and credibility. To be relevant, studies must represent one or more intended clinical use of the technology in the intended population and compare an effective and appropriate alternative at a comparable intensity. For some conditions, the alternative will be supportive care or surveillance. The quality and credibility of the evidence depend on study design and conduct, minimizing bias and confounding that can generate incorrect findings. The randomized controlled trial (RCT) is preferred to assess efficacy; however, in some circumstances, nonrandomized studies may be adequate. RCTs are rarely large enough or long enough to capture less common adverse events and long-term effects. Other types of studies can be used for these purposes and to assess generalizability to broader clinical populations and settings of clinical practice.

**Radiofrequency Volumetric Thermal Ablation**

**Clinical Context and Therapy Purpose**

The purpose of RFVTA in women who have uterine fibroids is to provide a treatment option that is an alternative to or an improvement on existing therapies.

The question addressed in this evidence review is: Does the use of RFVTA improve the net health outcome in women with uterine fibroids?

The following PICOs were used to select literature to inform this review.

**Patients**

The relevant population of interest are women with symptomatic uterine fibroids.

**Interventions**

The therapy being considered is RFVTA.

**Comparators**
The following therapies and practices are currently being used to make decisions about managing uterine fibroids: medical management, uterine artery embolization (UAE), myomectomy, and hysterectomy.

Outcomes

The outcomes of interest are, complications, postoperative pain and recovery time, symptom resolution, fibroid recurrence and need for reintervention at three to five years, and health-related QOL.

Systematic Reviews

A systematic review and meta-analysis by Sandberg et al (2018) evaluated the risk of reintervention for hysterectomy and QOL after uterine-sparing interventions for fibroids (see Tables 1 and 2). Risk of reintervention at 12 months was 0.3% for RFVTA compared with 3.6% for UAE and 1.1% for myomectomy. Symptom severity and QOL scores were similar for the three treatments. Only 1 RFVTA study was identified on reintervention risk at 36 months; none was identified on reintervention risk at 60 months. A systematic review by Havryliuk et al (2017) that did not separate outcomes by the length of follow-up found a reintervention rate of 5.2% after RFVTA (4 studies, 12 to 36 mo follow-up) compared to 4.2% after myomectomy (6 studies, 12 to 52 mo follow-up). There was no significant difference in complication rates between RFVTA (6.3%) and myomectomy (7.9%). The length of stay after myomectomy was two days (range 0.5 to 6.0). No data were provided on length of stay after RFVTA.

Lin et al (2018) conducted a meta-analysis of improvement in symptom severity, QOL, and reintervention after RFVTA. The review included one RCT and seven non-comparative trials. The recurrence risk at a weighted mean follow-up of 24.65 months (range, 3 to 36 months) was 4.4%. Improvements in symptoms and QOL were maintained out to 24 months in 3 studies and out to 36 months in 1 study. No studies were identified that had follow-up longer than 36 months.

Table 1. Characteristics of Systematic Reviews on RFVTA

<table>
<thead>
<tr>
<th>Study</th>
<th>Dates</th>
<th>Trials</th>
<th>Participants</th>
<th>N</th>
<th>Design</th>
<th>Duration, mo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sandberg et al</td>
<td>2006-2016</td>
<td>45</td>
<td>Women with symptomatic uterine fibroids undergoing myomectomy, UAE, or RFVTA</td>
<td>17,789</td>
<td>Studies evaluating reintervention for hysterectomy and quality of life with consecutive enrollment and follow-up of ≥12 mo</td>
<td>11.2-34.7</td>
</tr>
</tbody>
</table>

RFVTA: radiofrequency volumetric thermal ablation; UAE: uterine artery embolization.

Table 2. Results of Systematic Reviews on RFVTA

<table>
<thead>
<tr>
<th>Study</th>
<th>Reintervention Risk (95% CI), %</th>
<th>Symptom Severity Score (95% CI)</th>
<th>QOL (95% CI)</th>
</tr>
</thead>
</table>

Original Policy Date: July 2004
<table>
<thead>
<tr>
<th></th>
<th>At 12 Months</th>
<th>At 36 Months</th>
<th>At 60 Months</th>
<th>At 12 Months</th>
<th>At 24 Months</th>
<th>At 36 Months</th>
<th>At 12 Months</th>
<th>At 24 Months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sandberg et al (2018)[^1]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total studies</td>
<td>40</td>
<td>8</td>
<td>27</td>
<td>18</td>
<td></td>
<td></td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Myomectomy</td>
<td>1.1 (0.0 to 3.7)</td>
<td>1.2 (0.0 to 5.2)</td>
<td>12.2 (5.2 to 21.2)</td>
<td>-37.6 (-43.8 to -31.4)</td>
<td></td>
<td></td>
<td>39.9 (33.0 to 46.8)</td>
<td></td>
</tr>
<tr>
<td>UAE</td>
<td>3.6 (2.4 to 4.9)</td>
<td>7.4 (0.9 to 10.7)</td>
<td>14.4 (9.8 to 19.6)</td>
<td>-35.8 (-40.6 to -30.9)</td>
<td></td>
<td></td>
<td>38.9 (35.8 to 41.9)</td>
<td></td>
</tr>
<tr>
<td>RFVTA</td>
<td>0.3 (0.0 to 1.6)</td>
<td>10.4 (1 study)</td>
<td>Unknown</td>
<td>-37.0 (-44.6 to -29.4)</td>
<td></td>
<td></td>
<td>35.1 (28.7 to 41.6)</td>
<td></td>
</tr>
<tr>
<td>Lin et al (2018)[^4]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Studies</td>
<td>7</td>
<td></td>
<td></td>
<td>6</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>RVFTA</td>
<td>4.39 (1.60−8.45 )</td>
<td></td>
<td></td>
<td>-39.37 (-34.70 to -44.04)</td>
<td>-33.51 (-22.24 to -44.78)</td>
<td>-32.60 (-27.75 to -37.45)</td>
<td>29.21 (12.44 to 45.98)</td>
<td>38.6 (33.60 to 39.79)</td>
</tr>
<tr>
<td>P Value</td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>p&lt;0.001</td>
</tr>
</tbody>
</table>

CI: confidence interval; QOL: quality of life; RFVTA: radiofrequency volumetric thermal ablation; UAE: uterine artery embolization.

**Randomized Controlled Trials**

One RCT evaluating RFVTA was included in the Sandberg et al (2018) systematic review, with Tables 3 and 4 describing trial characteristics and results.

**Table 3. Summary of Key Randomized Controlled Trial Characteristics for RFVTA**

<table>
<thead>
<tr>
<th>Study</th>
<th>Countries</th>
<th>Sites</th>
<th>Dates</th>
<th>Participants[^4]</th>
<th>Interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brucker et al (2014)[^5]</td>
<td>Germany</td>
<td>1</td>
<td>2012-2013</td>
<td>≥18 y</td>
<td>RFVTA=26 LM=25</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Menstruating</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Symptomatic</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>uterine fibroids</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>&lt;10 cm</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Uterine size ≤16</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>gestational wk</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Desire uterine</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>conservation</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Not pregnant or</td>
<td></td>
</tr>
</tbody>
</table>
Laparoscopic and Percutaneous Techniques for the Myolysis of Uterine Fibroids

Lactating

LM: laparoscopic myomectomy; RFVTA: radiofrequency volumetric thermal ablation.

\(^a\) Key eligibility criteria.

### Table 4. Summary of Key Randomized Controlled Trial Outcomes for RFVTA

<table>
<thead>
<tr>
<th>Study</th>
<th>Primary Outcome</th>
<th>Secondary Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hospital LOS (SD, h)</td>
<td>Mean SSS</td>
</tr>
<tr>
<td></td>
<td>12 mo</td>
<td>24 mo</td>
</tr>
<tr>
<td>RFVTA</td>
<td>10.0 (5.5)</td>
<td>24.7</td>
</tr>
<tr>
<td>Laparoscopic myomectomy</td>
<td>29.9 (14.2)</td>
<td>26</td>
</tr>
<tr>
<td>p</td>
<td>&lt;0.001(^b)</td>
<td>NS(^c)</td>
</tr>
</tbody>
</table>

HRQOL: health-related quality of life; LOS: length of stay; NS: not significant; RFVTA: radiofrequency volumetric thermal ablation; SSS: Symptom Severity Score.

\(^a\) Analyses at 12 and 24 months were per protocol and included 84% of randomized participants.

\(^b\) Met criteria for noninferiority: hospital LOS after RFVTA no more than 10% longer than after laparoscopic myomectomy.

\(^c\) Exact between-group p values were not reported.

In the Brucker et al (2014) trial, all patients in the myomectomy group were hospitalized overnight; although not explicitly stated, this appeared to be the standard procedure at the study hospital. In the RFVTA (Acessa) group, there was an unplanned hospitalization due to unexplained vertigo and four hospitalizations as a standard procedure because the patients also underwent adhesiolysis.

Secondary outcomes of the RCT were reported by Hahn et al (2015)\(^2\) (12-month outcomes) and by Kramer et al (2016)\(^2\) (12-month and 24-month outcomes). In addition to summary symptom and QOL measures displayed in Table 2, the publications reported on 11 symptoms: heavy menstrual bleeding, increased abdominal girth, dyspareunia, pelvic discomfort/pain, dysmenorrhea, urinary frequency, urinary retention, sleep disturbance, backache, localized pain, and "other symptoms" (not specified).

Limitations of the 12- and 24-month analyses, shown in Tables 5 and 6, included lack of intention-to-treat analysis and failure to describe secondary study hypotheses and statistical analyses clearly. The RCT had a small sample size and thus might have been underpowered to detect clinically meaningful differences in secondary outcomes, so these results do not rule out potential differences between treatments.

### Table 5. Relevance Limitations

<table>
<thead>
<tr>
<th>Study</th>
<th>Population(^a)</th>
<th>Intervention(^b)</th>
<th>Comparator(^c)</th>
<th>Outcomes(^d)</th>
<th>Follow-Up(^e)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brucker et al</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1. Insufficient to determine reinvention rates</td>
</tr>
<tr>
<td>(2014)(^2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kramer et al</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2016)(^2)</td>
<td></td>
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</tr>
</tbody>
</table>

The study limitations stated in this table are those notable in the current review; this is not a comprehensive limitations assessment.

\(^a\) Population key: 1. Intended use population unclear; 2. Clinical context is unclear; 3. Study population is unclear; 4. Study population not representative of intended use.
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Laparoscopic and Percutaneous Techniques for the Myolysis of Uterine Fibroids

Intervention key: 1. Not clearly defined; 2. Version used unclear; 3. Delivery not similar intensity as comparator; 4. Not the intervention of interest.

Comparator key: 1. Not clearly defined; 2. Not standard or optimal; 3. Delivery not similar intensity as intervention; 4. Not delivered effectively.


Table 6. Study Design and Conduct Limitations

<table>
<thead>
<tr>
<th>Study</th>
<th>Allocatio n&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Blinding&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Selective Reporting&lt;sup&gt;c&lt;/sup&gt;</th>
<th>Data Completeness&lt;sup&gt;d&lt;/sup&gt;</th>
<th>Power&lt;sup&gt;e&lt;/sup&gt;</th>
<th>Statistical&lt;sup&gt;f&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kramer et al (2016)&lt;sup&gt;6&lt;/sup&gt;</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

The study limitations stated in this table are those notable in the current review; this is not a comprehensive limitations assessment.


Data Completeness key: 1. High loss to follow-up or missing data; 2. Inadequate handling of missing data; 3. High number of crossovers; 4. Inadequate handling of crossovers; 5. Inappropriate exclusions; 6. Not intent to treat analysis (per protocol for noninferiority trials).

Power key: 1. Power calculations not reported; 2. Power not calculated for primary outcome; 3. Power not based on clinically important difference.

Statistical key: 1. Analysis is not appropriate for outcome type: (a) continuous; (b) binary; (c) time to event; 2. Analysis is not appropriate for multiple observations per patient; 3. Confidence intervals and/or p values not reported; 4. Comparative treatment effects not calculated.

Pregnancy Outcomes After RFVTA

Keltz et al (2017) published a systematic review of published literature on pregnancy outcomes after thermal ablation of uterine fibroids.<sup>5</sup> For RFVTA, reviewers identified 20 pregnancies reported in 4 case series; the denominator (ie, the number of patients treated in these series) was not reported. Of the 20 pregnancies, 7 were undesired and were electively terminated. For the remaining 13 pregnancies, there was 1 spontaneous abortion and 12 full-term births. Nine of the 12 live births were delivered by cesarean section.

Section Summary: RFVTA

Systematic reviews and an RCT comparing RFVTA with laparoscopic myomectomy have been published. The meta-analysis found low rates of reintervention with RFVTA and QOL outcomes that were similar to
Laparoscopic and Percutaneous Techniques for the Myolysis of Uterine Fibroids

myomectomy and UAE at 12 months. Data on reintervention rates at 36 months was limited to a single study and no studies reported reintervention rates at 60 months. The RCT found that RFVTA was noninferior to laparoscopic myomectomy on the primary outcome (length of hospitalization). A number of secondary outcomes of the RCT were reported at 12 and 24 months, including symptoms and QOL outcomes; none differed significantly between groups. The RCT only had 43 patients in subgroup analyses at 12 and 24 months. Additional well-designed RCTs with longer follow-up are needed to determine the effect of RFVTA on health outcomes compared with other treatment options.

Laser or Bipolar Needles

Clinical Context and Therapy Purpose

The purpose of therapy with laser or bipolar needles in patients who have uterine fibroids is to provide a treatment option that is an alternative to or an improvement on existing therapies.

The question addressed in this evidence review is: Does the use of laser or bipolar needles improve the net health outcome in women with uterine fibroids?

The following PICOs were used to select literature to inform this review.

Patients

The relevant population of interest are women with symptomatic uterine fibroids.

Interventions

The therapy being considered is laser or bipolar needles.

Comparators

The following therapies and practices are currently being used to make decisions about managing uterine fibroids: medical management, UAE, myomectomy, and hysterectomy.

Outcomes

The outcomes of interest are, complications, postoperative pain and recovery time, symptom resolution, need for reintervention, and health-related QOL. The immediate follow-up would be a week for postoperative pain and recovery, and three to five years of follow-up would be needed to monitor for fibroid recurrence and retreatment.

Case Series

Several case series were identified, most published in the 1990s. For example, Goldfarb (1995) reported on outcomes for 300 women with symptomatic fibroids no larger than 10 cm who underwent myolysis using either Nd:YAG or bipolar needles." The author reported that the coagulating effect of the bipolar needle devascularized the fibroids, and the resulting shrinkage was comparable to that produced by Nd:YAG laser. An earlier study by Goldfarb (1992), included 75 patients who presented with symptomatic fibroids 5 to 10 cm in diameter.10 Symptoms included pelvic pain, pressure, dyspareunia, and recurrent menorrhagia. The Nd:YAG laser was inserted into the fibroid multiple times (eg, 75 to 100 punctures to coagulate a 5-cm fibroid). Based on an assessment by endovaginal ultrasound, the fibroids regressed in size and, after 6 to 14 months of follow-up, the size remained stable. No patient experienced significant complications. Nisolle et al (1993) reported on a case series of 48 women offered myolysis instead of myomectomy if they had completed childbearing.11 The authors reported that maximal decrease in fibroid size had occurred by 6 months, however, as reported, it is unclear among the 28 of 48 patients with more than 2 fibroids whether all fibroids were treated in each patient,
and, if not, how treated fibroids were selected. Additionally, no associated patient symptoms were reported.

Several authors have reported pelvic adhesions as a complication of the Nd:YAG laser procedure, presumably due to thermal damage to the serosal surface. In addition, the Nd:YAG laser produces a significant amount of smoke, which can obscure visibility.12,13.

**Section Summary: Laser or Bipolar Needles**

The evidence base on the use of lasers or bipolar needles only includes case series, small in size, and published in the 1990s. RCTs comparing laser and bipolar needles with alternative treatments for uterine fibroids and reporting health outcomes are needed.

**Cryomyolysis**

**Clinical Context and Therapy Purpose**

The purpose of cryomyolysis in patients who have uterine fibroids is to provide a treatment option that is an alternative to or an improvement on existing therapies.

The question addressed in this evidence review is: Does cryomyolysis improve the net health outcome in women with uterine fibroids?

The following PICOs were used to select literature to inform this review.

**Patients**

The relevant population of interest are women with symptomatic uterine fibroids.

**Interventions**

The therapy being considered is cryomyolysis. Cryomyolysis entails inserting a -180°C cryoprobe into the center of a fibroid, which creates an "iceball" within the fibroid. Several freeze-thaw cycles are typically used, and the process may not be standardized.

**Comparators**

The following therapies and practices are currently being used for managing uterine fibroids: medical management, UAE, myomectomy, and hysterectomy.

**Outcomes**

The outcomes of interest are, complications, postoperative pain and recovery time, symptom resolution, need for reintervention, and health-related QOL. The immediate follow-up would be a week for postoperative pain and recovery, and three to five years of follow-up would be needed to monitor for fibroid recurrence and retreatment.

**Case Series**

No controlled studies evaluating cryomyolysis were identified.

Two case series have been identified. Zreik et al (1998)14 published a prospective pilot study with 14 patients, and Zupi et al (2004)15 presented their experience with 20 patients.14,15 In both case series, the authors reported that patients had symptom resolution. In the Zreik et al (1998) series, cryomyolysis maintained or slightly reduced the myoma volume by 6%. In the Zupi et al (2004) study, cryomyolysis was associated with a 25% reduction in fibroid size. Zupi et al (2005) reported on the 1-year follow-up of these patients.15 Mean shrinkage in fibroid size continued until 9 months after surgery, to a mean volume reduction of 60%. In the Sandberg et al (2018) systematic review
Laparoscopic and Percutaneous Techniques for the Myolysis of Uterine Fibroids

(discussed above), the risk of reintervention was 15%. Interpretation of these studies is limited due to their small sample sizes and lack of comparison groups.

Section Summary: Cryomyolysis

The literature on cryomyolysis includes small case series, with no literature identified in the last decade. Controlled studies comparing cryomyolysis with alternative treatments for uterine fibroids and differentiating between outcomes related to fibroid treatment and outcomes related to the treatment of abnormal bleeding are needed.

Magnetic Resonance Imaging-Guided Laser Ablation

Clinical Context and Therapy Purpose

The purpose of MRI-guided laser ablation in patients who have uterine fibroids is to provide a treatment option that is an alternative to or an improvement on existing therapies.

The question addressed in this evidence review is: Does MRI-guided laser ablation improve the net health outcome in women with uterine fibroids?

The following PICOs were used to select literature to inform this review.

Patients

The relevant population of interest are women with symptomatic uterine fibroids.

Interventions

The therapy being considered is MRI-guided laser ablation.

Comparators

The following therapies are currently being used about managing uterine fibroids: medical management, UAE, myomectomy, and hysterectomy.

Outcomes

The outcomes of interest are, complications, postoperative pain and recovery time, resolution of symptoms, need for reintervention, and health-related QOL. The immediate follow-up would be a week for postoperative pain and recovery, and three to five years of follow-up would be needed to monitor for fibroid recurrence and retreatment.

Nonrandomized Studies

No RCTs evaluating MRI-guided laser ablation were identified. A nonrandomized study by Hindley et al (2002) was identified (see Tables 7 and 8). Results from the women treated with MRI-guided laser ablation were compared with a historical control group of 43 women who underwent a hysterectomy. Compared with the historical control group, the total score on the Menorrhagia Outcomes Questionnaire was significantly lower (ie, worse outcomes) in those undergoing percutaneous myolysis. The QOL subscores did not differ statistically.

Table 7. Summary of Key Nonrandomized Trial Characteristics

<table>
<thead>
<tr>
<th>Study</th>
<th>Type</th>
<th>Country</th>
<th>Participants</th>
<th>Treatment</th>
<th>Comparator</th>
<th>FU, y</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hindley et al (2002)</td>
<td>Cohort with historical controls</td>
<td>U.K.</td>
<td>109 women with symptomatic fibroids seeking to avoid</td>
<td>66 to MRI-guided laser ablation</td>
<td>43 to hysterectomy</td>
<td>1</td>
</tr>
</tbody>
</table>
surgery

FU: follow-up; MRI: magnetic resonance imaging.

Table 8. Summary of Key Nonrandomized Trial Results

<table>
<thead>
<tr>
<th>Study</th>
<th>Mean Fibroid Volume Reduction (Range), %</th>
<th>MOQ Total</th>
<th>MOQ QOL/Satisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>At 3 Months</td>
<td>At 1 Year</td>
<td></td>
</tr>
<tr>
<td>MRI-guided laser ablation</td>
<td>-31 (21 to -76)</td>
<td>-41 (13 to -78)</td>
<td>51.5</td>
</tr>
<tr>
<td>Hysterectomy</td>
<td>NR</td>
<td>NR</td>
<td>48.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>49.0</td>
</tr>
</tbody>
</table>

MRI: magnetic resonance imaging; MOQ: Menorrhagia Outcomes Questionnaire; NR: not reported; QOL: Quality of Life.

The purpose of the limitations tables (see Tables 9 and 10) is to display notable limitations identified in each study. This information is synthesized as a summary of the body of evidence following each table and provides the conclusions on the sufficiency of the evidence supporting the position statement.

Table 9. Relevance Limitations

<table>
<thead>
<tr>
<th>Study</th>
<th>Population</th>
<th>Intervention</th>
<th>Comparator</th>
<th>Outcomes</th>
<th>Follow-Up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hindley et al (2002)</td>
<td>4.</td>
<td>Self-selected population seeking to avoid open surgery</td>
<td>Not sufficient duration to assess reintervention</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The study limitations stated in this table are those notable in the current review; this is not a comprehensive limitations assessment.

Table 10. Study Design and Conduct Limitations

<table>
<thead>
<tr>
<th>Study</th>
<th>Allocation</th>
<th>Blinding</th>
<th>Selective Reporting</th>
<th>Data Completeness</th>
<th>Power</th>
<th>Statistical</th>
</tr>
</thead>
</table>

The study limitations stated in this table are those notable in the current review; this is not a comprehensive limitations assessment.
MP 4.01.19
Laparoscopic and Percutaneous Techniques for the Myolysis of Uterine Fibroids

\[\text{Allocation key: 1. Participants not randomly allocated; 2. Allocation not concealed; 3. Allocation concealment unclear; 4. Inadequate control for selection bias.}\]
\[\text{Blinding key: 1. Not blinded to treatment assignment; 2. Not blinded outcome assessment; 3. Outcome assessed by treating physician.}\]
\[\text{Selective Reporting key: 1. Not registered; 2. Evidence of selective reporting; 3. Evidence of selective publication.}\]
\[\text{Data Completeness key: 1. High loss to follow-up or missing data; 2. Inadequate handling of missing data; 3. High number of crossovers; 4. Inadequate handling of crossovers; 5. Inappropriate exclusions; 6. Not intent to treat analysis (per protocol for noninferiority trials).}\]
\[\text{Power key: 1. Power calculations not reported; 2. Power not calculated for primary outcome; 3. Power not based on clinically important difference.}\]
\[\text{Statistical key: 1. Analysis is not appropriate for outcome type: (a) continuous; (b) binary; (c) time to event; 2. Analysis is not appropriate for multiple observations per patient; 3. Confidence intervals and/or p values not reported; 4. Comparative treatment effects not calculated.}\]

Section Summary: MRI-Guided Laser Ablation

A single nonrandomized study with historical controls was identified. Data reporting was incomplete, and self-reported outcomes were worse compared with a historical control group of women undergoing a hysterectomy. RCTs comparing MRI-guided laser ablation with alternative treatments for uterine fibroids and reporting health outcomes are needed.

Summary of Evidence

For individuals who have symptomatic uterine fibroids who receive RFVTA, the evidence includes an RCT and systematic review. The relevant outcomes are symptoms, QOL, and treatment-related morbidity. The meta-analysis found low rates of reintervention with RFVTA and QOL outcomes that were similar to uterine artery embolization and myomectomy at 12 months. Data on reintervention rates at 36 months were limited to 1 study and no studies reported reintervention rates at 60 months. The single RCT with a follow-up longer than three months found that RFVTA was noninferior to laparoscopic myomectomy on the trial's primary outcome: length of hospitalization. A number of secondary outcomes were reported at 12 and 24 months, including symptoms and QOL. None of the secondary outcomes demonstrated significant between-group differences in a subgroup analysis of 43 patients. Additional well-designed RCTs with longer follow-up are needed to determine the effect of RFVTA on health outcomes compared with other treatment options. The evidence is insufficient to determine the effects of the technology on health outcomes.

For individuals who have symptomatic uterine fibroids who receive laser or bipolar needles, the evidence includes case series. The relevant outcomes are symptoms, QOL, and treatment-related morbidity. The case series were published in the 1990s, and the procedures used then may not reflect current practice. RCTs comparing laser or bipolar needles with alternative treatments for uterine fibroids are needed to evaluate the safety and efficacy of this technology adequately. The evidence is insufficient to determine the effects of the technology on health outcomes.

For individuals who have symptomatic uterine fibroids who receive cryomyolysis, the evidence includes case series. The relevant outcomes are symptoms, QOL, and treatment-related morbidity. Among the few case series, sample sizes were small (≤20 patients). RCTs comparing cryomyolysis with alternative treatments for uterine fibroids are needed to evaluate the safety and efficacy of this technology adequately. The evidence is insufficient to determine the effects of the technology on health outcomes.
For individuals who have symptomatic uterine fibroids who receive magnetic resonance imaging-guided laser ablation, the evidence includes a study with historical controls. The relevant outcomes are symptoms, QOL, and treatment-related morbidity. A single study with historical controls is not sufficiently robust to evaluate this technology. RCTs comparing magnetic resonance imaging-guided laser ablation with alternative treatments for uterine fibroids are needed to evaluate safety and efficacy adequately. The evidence is insufficient to determine the effects of the technology on health outcomes.

SUPPLEMENTAL INFORMATION

Practice Guidelines and Position Statements

American College of Obstetricians and Gynecologists

The American College of Obstetricians and Gynecologists (2019) reaffirmed its 2008 position on alternatives to hysterectomy in the management of leiomyomas.\textsuperscript{18,19} Recommendations based on good and consistent scientific evidence were that abdominal myomectomy is a safe and effective treatment for women with symptomatic leiomyomas and that uterine artery embolization is a safe and effective option for appropriately selected women who want to retain their uterus. The bulletin contained no recommendations on myolysis using laparoscopic or percutaneous techniques.

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 evidence review are listed in Table 11.

Table 11. Summary of Key Trials

<table>
<thead>
<tr>
<th>NCT No.</th>
<th>Trial Name</th>
<th>Planned Enrollment</th>
<th>Completion Date</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ongoing</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NCT02260752</td>
<td>Patient-Centered Results for Uterine Fibroids (COMPARE-UF)</td>
<td>3,094</td>
<td>Apr 2020</td>
</tr>
<tr>
<td>NCT02100904</td>
<td>Uterine Leiomyoma Treatment With Radiofrequency Ablation (ULTRA Registry)</td>
<td>200</td>
<td>Jun 2022</td>
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<tr>
<td>NCT03219385</td>
<td>Directed Ablation of Uterine Fibroids Using a Noninvasive Approach (DIANA)</td>
<td>180</td>
<td>Sep 2022</td>
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<tr>
<td>NCT03118037</td>
<td>Transcervical Radiofrequency Ablation of Uterine Fibroids Global Registry (SAGE)</td>
<td>100</td>
<td>Dec 2023</td>
</tr>
<tr>
<td>NCT02163525*</td>
<td>Post Market TRUST - U.S.A. Study</td>
<td>114</td>
<td>Jun 2024</td>
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<tr>
<td><strong>Unpublished</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NCT01750008*</td>
<td>The LUSTOR (Laparoscopic Uterine Sparing Techniques)</td>
<td>51</td>
<td>Jun 2018</td>
</tr>
</tbody>
</table>
Outcomes and Reinterventions)Trial
NCT: national clinical trial.

a Denotes industry-sponsored or cosponsored trial.

ESSENTIAL HEALTH BENEFITS

The Affordable Care Act (ACA) requires fully insured non-grandfathered individual and small group benefit plans to provide coverage for ten categories of Essential Health Benefits (“EHBs”), whether the benefit plans are offered through an Exchange or not. States can define EHBs for their respective state.

States vary on how they define the term small group. In Idaho, a small group employer is defined as an employer with at least two but no more than fifty eligible employees on the first day of the plan or contract year, the majority of whom are employed in Idaho. Large group employers, whether they are self-funded or fully insured, are not required to offer EHBs, but may voluntary offer them.

The Affordable Care Act requires any benefit plan offering EHBs to remove all dollar limits for EHBs.

REFERENCES


CODES

<table>
<thead>
<tr>
<th>Codes</th>
<th>Number</th>
<th>Description</th>
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</thead>
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<tr>
<td>CPT</td>
<td>58674</td>
<td>Laparoscopy, surgical, ablation of uterine fibroid(s) including intraoperative ultrasound guidance and monitoring, radiofrequency</td>
</tr>
<tr>
<td>ICD-10-CM</td>
<td>D25.0-D25.9</td>
<td>Leiomyoma of uterus, code range</td>
</tr>
<tr>
<td>ICD-10-PCS</td>
<td>0U593ZZ, 0U594ZZ, 0U598ZZ</td>
<td>Surgical, female reproductive system, destruction, uterus, code range</td>
</tr>
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</table>

Type of Service: Surgery
Place of Service: Inpatient/Outpatient

POLICY HISTORY

<table>
<thead>
<tr>
<th>Date</th>
<th>Action</th>
<th>Description</th>
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<tbody>
<tr>
<td>07/10/14</td>
<td>Replace policy</td>
<td>Policy updated with literature review through June 16, 2014. References 2, 4, and 15 added. Policy statement unchanged</td>
</tr>
<tr>
<td>07/09/15</td>
<td>Replace policy</td>
<td>Policy updated with literature review through June 1, 2015; references 5 and 15 added. Policy statement unchanged.</td>
</tr>
<tr>
<td>08/11/16</td>
<td>Replace policy</td>
<td>Policy updated with literature review through July 8, 2016; references 3-4 added. Policy statement unchanged</td>
</tr>
<tr>
<td>12/08/16</td>
<td>Replace policy – coding update only</td>
<td>CPT coding updated</td>
</tr>
<tr>
<td>08/30/17</td>
<td>Replace policy</td>
<td>Blue Cross of Idaho adopted changes to policy as noted. Policy updated with literature review through 2017; references 7 and 18 added. Policy statement unchanged</td>
</tr>
</tbody>
</table>

Original Policy Date: July 2004
<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
<th>Description</th>
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<tr>
<td>08/20/18</td>
<td>Replace policy</td>
<td>Blue Cross of Idaho adopted changes as noted. Policy updated with literature review through June 4, 2018; reference 2 added. Policy statement unchanged.</td>
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<tr>
<td>08/22/19</td>
<td>Replace policy</td>
<td>Blue Cross of Idaho adopted changes as noted, effective 08/22/2019. Policy updated with literature review through June 16, 2019; references added. Policy statement unchanged.</td>
</tr>
</tbody>
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