Society of Interventional Radiology Clinical Practice Guideline for the Embolization of Uterine Fibroids DRAFT

DRAFT MANUSCRIPT

I. SUMMARY OF RECOMMENDATIONS

1. **For women with symptomatic uterine fibroids who are candidates for uterine-sparing therapy, UFE should be offered as an alternative to myomectomy.**

   CCR Strength: Moderate
   GRADE Certainty: Moderate (≥2 moderate-quality comparative studies; mixed risk of bias and imprecision noted in GRADE tables)

2. **For women who do not desire future menstruation or uterine preservation, hysterectomy remains a highly effective option with long-term satisfaction comparable to UFE.**

   CCR Strength: Moderate
   GRADE Certainty: Moderate (≥2 moderate-quality RCTs/cohorts with some imprecision)

3. **Patients should be counseled that the risk of re-intervention appears higher after UFE than after some myomectomy strategies, particularly beyond the first postoperative year.**

   CCR Strength: Moderate
   GRADE Certainty: Moderate (multiple RCTs and observational studies; consistent direction of effect despite varying quality)

4. **When discussing peri-procedural risks and recovery profiles with patients, it should be noted that serious adverse event (SAE) rates are generally low and similar between UFE and surgery in available trials, though estimates are imprecise.**

   CCR Strength: Limited
   GRADE Certainty: Low (≥2 low-quality studies; small samples; imprecision)

5. **Consistently across clinical trials and observation cohorts, UFE is associated with shorter hospital stays and faster return to normal activity compared with surgical alternatives.**

   CCR Strength: Moderate
   GRADE Certainty: Moderate (multiple RCTs and observational studies)

6. **Patients should be informed that overall satisfaction is high and comparable between UFE and surgery through long-term follow-up.**

   CCR Strength: Moderate
   GRADE Certainty: Moderate (≥2 moderate-quality studies; consistent findings)

7. **Include cost considerations in shared decision-making: UFE procedure costs are often lower than hysterectomy or myomectomy, while 12-month total payer costs are generally similar across options.**

   CCR Strength: Moderate
   GRADE Certainty: Moderate (≥2 moderate-quality cost analyses; consistent direction)

8. **Myomectomy may be considered over UFE for patients whose primary goal is future pregnancy or live birth.**

   CCR Strength: Limited
   GRADE Certainty: Very low (heterogeneous studies, largely observational with bias)

9. **It may be reasonable that patients are advised that short-term ovarian reserve (AMH/FSH) appears broadly similar after UFE and myomectomy in small studies. The evidence is limited and heterogeneous and age strongly modifies risk.**

   CCR Strength: Limited
   GRADE Certainty: Low to very low (observation, indirectness, risk of bias)

10. **It is recommended that shared decision-making explicitly weighs the uncertain comparative live-birth data, potential for non-target ovarian impact after UFE (especially with advancing age), and the established uterine cavity restoration advantages of myomectomy for cavity-distorting fibroids.**

    CCR strength: Strong
    GRADE certainty: N/A (consensus)

11. **Evidence is insufficient to determine whether, among women with a prior myomectomy, UFE or repeat myomectomy yields better reproductive outcomes. Treatment recommendation should be individualized based on clinical presentation, anatomic considerations, and patient values.**

    CCR Strength: Limited
    GRADE certainty: Insufficient/very low

12. **For patients prioritizing durable symptom control, UFE can be recommended over MRgFUS because UFE is associated with substantially lower re-intervention through 1–5 years.**

    CCR Strength: Moderate
    GRADE Certainty: Low (observation, risk of bias, consistent direction of evidence)

13. **If a patient's short-term symptom score improvement is prioritized over long-term durability, MRgFUS may provide larger 12-month symptom score gains when compared to UFE. This should be discussed alongside its higher re-intervention risk.**

    CCR Strength: Limited
    GRADE Certainty: Very Low (observational, risk of bias)

14. **For patients actively pursuing future pregnancy or desiring to preserve ovarian reserve, the evidence is insufficient to recommend one modality (UFE or MRgFUS) over the other.**

    CCR Strength: Limited
    GRADE Certainty: Very Low (Observational, risk of bias)

15. **Shared decision-making is the preferred approach for patients with symptomatic uterine fibroids to ensure that treatment selection is individualized and aligned with personal goals, including future reproductive plans. Choices among surgical options, UFE, and MR-guided focused ultrasound should reflect both patient preferences and local clinical expertise.**

    Clinical Care Recommendation: Strong
    GRADE Certainty: N/A (Consensus)

II. INTRODUCTION

This clinical practice guideline is based on a systematic review of published studies on the use of uterine fibroid embolization (UFE) in the treatment of patients with symptomatic uterine fibroids. It is reported and conducted in alignment with the Preferred Reporting Items for Systematic reviews and eta-Analyses (PRISMA) (1). In addition to providing recommendations to guide clinical decision-making, this guideline also emphasizes gaps in the literature and areas that would benefit from additional research. The intended audience for this guideline is all appropriately trained and qualified clinicians involved in the management of patients with uterine fibroids, administrators, and policy makers. Uterine fibroid care is delivered by different medical specialties, including those that focus on medical management and those that provide surgical and minimally-invasive interventions.

Uterine fibroids (leiomyomas) are the most common benign tumors of the female reproductive tract and constitute a major source of gynecologic morbidity worldwide. Up to 70-80% of women will develop fibroids by 50 years of age with a higher prevalence, earlier onset, and greater symptom burden among black women (2,3). While many patients with fibroids remain asymptomatic, a substantial portion of affected patients experience clinically significant symptoms that include heavy menstrual bleeding,

pelvic pain or pressure, bulk-related urinary or bowel dysfunction, anemia, and adverse reproductive outcomes such as infertility and pregnancy complications (4,5). Fibroids arise from uterine smooth muscle cells and generally respond to hormones. Their growth and symptom expression is influenced by estrogen and progesterone signaling. Clinical manifestations are heterogeneous and vary based on fibroid size, number, vascularity, and location within the uterus (submucosal, intramural, or subserosal) (6). Management options range from expectant management, medical therapies focused on symptom control, and procedural or surgical interventions. Procedural treatments include UFE, Magnetic Resonance guided focused ultrasound (MRgFUS), radiofrequency ablation (RFA), myomectomy, and hysterectomy. These options are associated with differing levels of effectiveness, risk, recovery profile, and implications for uterine preservation and future fertility (7, 8, 9). Given the heterogeneity of disease presentation and patient preferences, optimal management requires individualized, patient-centered decision-making supported by high-quality evidence regarding symptom relief, durability of response, safety, and quality-of-life outcomes. This guideline was created with multidisciplinary input to improve the quality of care for patients with symptomatic uterine fibroids who may require an intervention.

III. MATERIALS AND METHODS

The methods used to perform the systematic review supporting the guideline recommendations were employed to minimize bias and enhance transparency in the selection, appraisal, and analysis of the available evidence.

Panel Formation and Conflict of Interest Review: The chair of the panel was nominated by the SIR Executive Committee and reviewed for potential conflicts of interest (COIs). The chair, along with the SIR Guidelines and Statements Division Councilor, subsequently nominated panelists, ensuring a multidisciplinary panel of experts was included. All panel nominees were reviewed for potential COIs in accordance with the SIR COI policy for clinical practice guidelines. The policy adheres to the National Academy of Medicine guidance for COI (10). The final panel consisted of 8 interventional radiologists, 1 diagnostic radiologist, and 2 representatives from obstetrics and gynecology.

Key Question Development: Approved panelists met during an introductory meeting on August 5, 2024, to establish the scope of the clinical practice guideline by developing key clinical questions in the patient, intervention, control/comparator, outcome (PICO) format. The panel agreed on 3 PICO questions (Table 1) that covered management and use of UFE in patients with symptomatic uterine fibroids. Full inclusion and exclusion criteria for each question can be found in Appendix A.

Table 1: Uterine Fibroid Embolization Key Clinical Questions

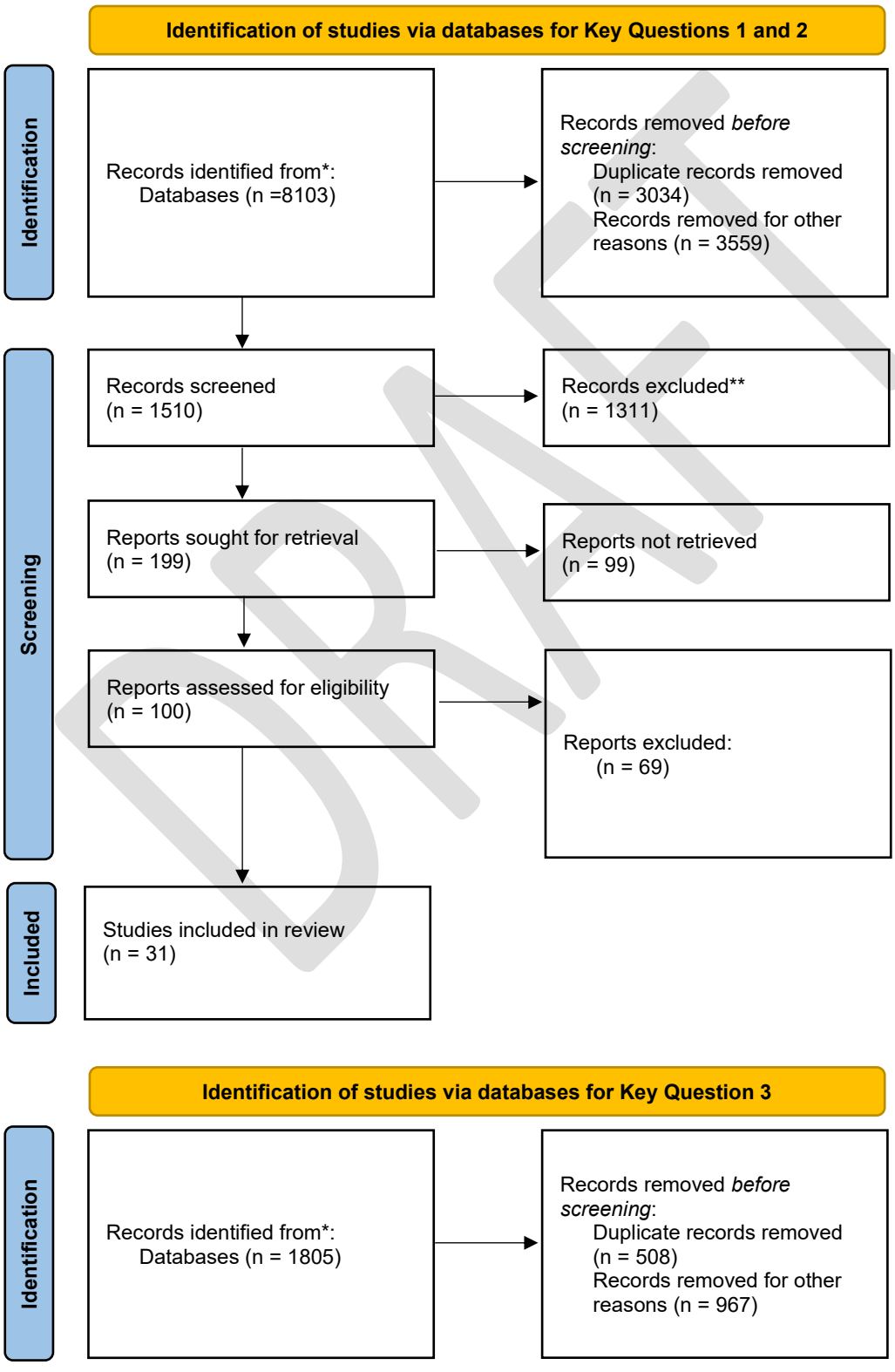
Key Question 1	In patients with symptomatic fibroids, what is the effectiveness of UFE compared to surgical intervention?
Key Question 2	In patients who are interested in future fertility, what are the reproductive outcomes of UFE compared to myomectomy?
Key Question 3	In patients with symptomatic fibroids, what is the effectiveness of UFE compared to MR-guided focused ultrasound?

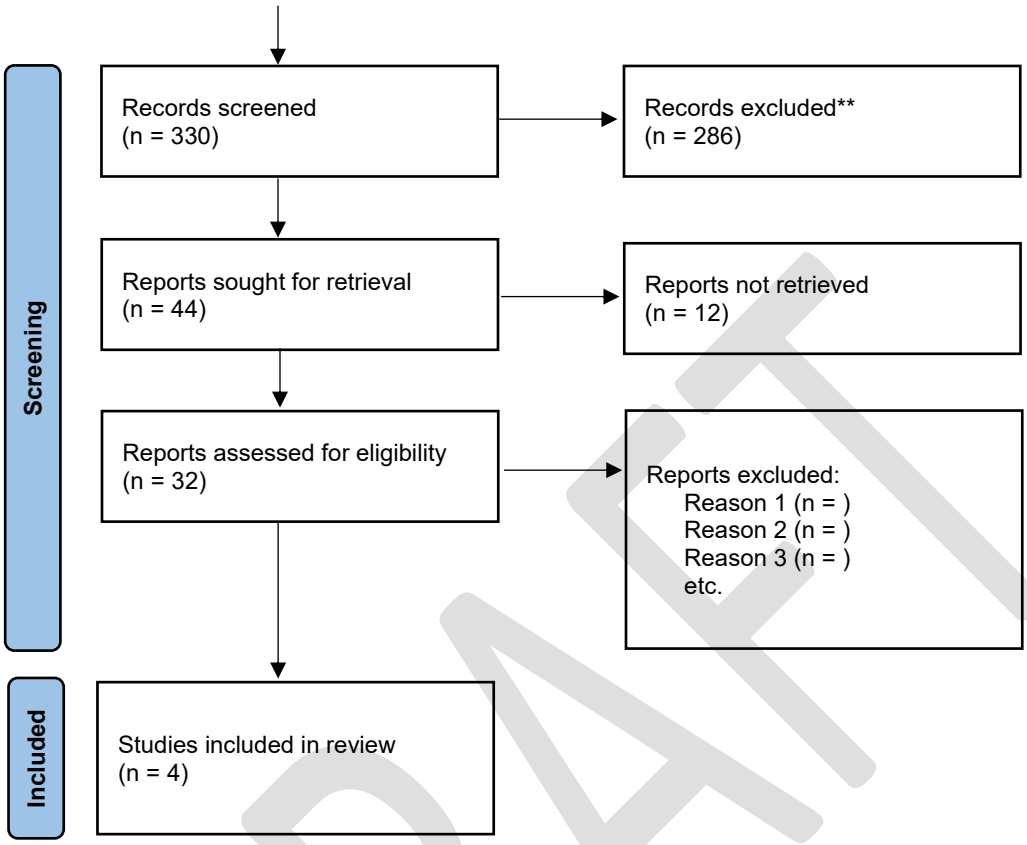
Literature Searches: A medical librarian from the SIR conducted a comprehensive search of MEDLINE, Embase, and the Cochrane Central Register of Controlled Trials in August 2024 based on key terms and concepts from the clinical practice guideline development group's PICO questions. Bibliographies of relevant systematic reviews were hand-searched for additional references. An updated search was conducted on September 13, 2024, with results limited to English-language publications between 1966 and that day. The full search strategies are reported in Appendix B (available online on the article's Supplemental Material page at www.jvir.org).

Study Selection and Data Extraction: The panel reviewed the literature search results and selected studies for inclusion and exclusion according to eligibility criteria (Appendix A). In addition to having the required outcome measures, studies were included if they were randomized controlled trials (RCTs), observational studies with two arms (retrospective and prospective cohorts, case-control), or national database studies with two arms. Non-comparative studies (i.e. single arm cohort, case series, etc.) and non-systematic reviews were excluded. SIR partnered with the Clinical Evidence and Guidelines department of the Emergency Care Research Institute (ECRI) for the data analysis. The ECRI team screened the full-text of the included studies and excluded full-texts that did not meet the eligibility criteria. A total of four systematic reviews [9, 11-13], five RCTs from 11 publications [14-24], and 17 observational studies from 18 publications [25-42] met the inclusion criteria. Full references of the excluded studies and the reasons for exclusion are provided in Appendix C. ECRI methodologists reviewed the results of the literature search for relevant studies meeting the inclusion criteria and extracted all relevant data. To ensure accuracy and consistency, a second reviewer verified the extracted data for a 10% sample of the included studies. Details of study selection and final number of included studies can be found in Figure 1. The risk of bias in the included studies was evaluated by using AMSTAR 2 (43) for systematic reviews, RoB 2 for randomized trials (44), and ROBINS-I (45) for non-randomized studies. Risk of bias ratings are available in Appendix D. The GRADE methodology was used to compile the extracted data into evidence tables and synthesize the findings narratively (Appendix E: available

online on the article's Supplemental Material page at www.jvir.org). No meta-analysis was conducted. Results of economic studies that would inform the panel's decision making were narratively summarized.

Figure 1: PRISMA Flow Diagram for Questions 1-3





Drafting and Defining the Strength of the Recommendations: The panel developed clinical care recommendations for each of the PICO questions in January 2026. Panel members made decisions regarding the balance between benefit and harm, impact on patients' values and preferences, cost, feasibility, and acceptability of the intervention. The SIR system of defining the strength of a clinical care recommendation was used in formulating the grade for each recommendation. The strength of recommendation (Table 2) also takes into account the quality, quantity, and the trade-off between the benefits and harms of a treatment; the magnitude of a treatment's effect; and whether there are data on critical outcomes. Recommendations graded as high or moderate use the wording "is recommended/indicated/effective/useful" or "is reasonable/can be useful/can be beneficial/can be effective", respectively. This is compared to recommendations graded as "limited" use the wording "may be reasonable/may be considered." Clinical care recommendation statements are accompanied by the GRADE assessment of certainty pertaining to the body of literature that informed the clinical decision.

Table 2: Society of Interventional Radiology Clinical Care Recommendation System

Clinical Care Recommendation (CCR)	GRADE Certainty
STRONG Suggested phrases: • Is recommended • Is indicated / effective / useful / beneficial • Should be performed	**High** • High confidence in effect estimates • Well-conducted studies, consistent results • Further research unlikely to change confidence
MODERATE Suggested phrases: • Is reasonable • Can be useful / beneficial / effective • Treatment A may be offered	**Moderate** • Evidence supports conclusion • Further research may impact confidence • Possible limitations or bias
LIMITED Suggested phrases: • May be reasonable / considered • Usefulness uncertain or not established	**Low** • Limited evidence • True effect may differ substantially • Additional research likely impactful
NO BENEFIT Suggested phrases: • Not recommended • Not effective / useful / beneficial • Should not be performed	**Very Low** • Insufficient evidence • Major limitations or sparse data • True effect unknown
POTENTIAL HARM Suggested phrases: • Potentially or definitively harmful • Excess morbidity/mortality • Should not be performed	**N/A (Consensus)** • Expert opinion

Voting on the Recommendations: The recommendations and their strength were voted on by the guideline panel members during the final full panel meeting held virtually on January 27, 2026. Any panelists with COIs deemed to be significant recused themselves from voting. Recommendation statements were approved and adopted in instances in which a majority (80%) of the guideline development group voted to approve; however, the guideline development group had consensus (100% approval) when voting on every recommendation for this guideline.

Document Peer Review and Approval: Reviewers from the participating societies and the SIR Women's Health Clinical Specialty Council reviewed the content and methods, including consistency, accuracy, and completeness. The manuscript was revised after consideration by the panel of the feedback

received from the peer reviewers. SIR's Executive Committee provided final approval of the revised manuscript before submission to the *Journal of Vascular and Interventional Radiology.*

IV. RESULTS

IV.1 KQ1 - In patients with symptomatic fibroids, what is the effectiveness of UFE compared to surgical intervention?

IV.1.1 Symptom Improvement and Quality of Life

Clinical Care Recommendations:

1. **For women with symptomatic uterine fibroids who are candidates for uterine-sparing therapy, UFE should be offered as an alternative to myomectomy.**

   CCR Strength: Moderate

   GRADE Certainty: Moderate (≥2 moderate-quality comparative studies; mixed risk of bias and imprecision noted in GRADE tables)

   Summary of the evidence: For women with symptomatic uterine fibroids who desire uterine preservation, UFE offers a viable alternative to myomectomy, with comparable improvements in fibroid-related symptoms and health-related quality of life over medium-term follow-up (1–5 years). A recent systematic review and meta-analysis by Peng et al. (13), including 13 studies (4 randomized trials and 9 observational cohorts), demonstrated similar gains in symptom severity and quality-of-life scores between UFE and myomectomy at four years, despite higher rates of reintervention and subsequent hysterectomy following UFE (15). Consistent with these findings, a prospective comparative study by Aktürk et al. reported no significant differences in quality-of-life trajectories between treatment groups, although recurrence rates were somewhat higher after UFE (28). Several comparative studies also report shorter hospital stays and faster recovery following UFE, which may be clinically meaningful for selected patients. Overall certainty is moderated by study heterogeneity, mixed risk of bias, and imprecision related to recurrence and reintervention outcomes, supporting UFE as an option to be offered.

2. **For women who do not desire future menstruation or uterine preservation, hysterectomy remains a highly effective option with long-term satisfaction comparable to UFE.**

CCR Strength: Moderate

GRADE Certainty: Moderate (≥2 moderate-quality RCTs/cohorts with some imprecision)

Summary of the evidence: Randomized and comparative evidence demonstrates that hysterectomy provides definitive and highly durable symptom resolution for women with symptomatic uterine fibroids who do not desire future menstruation of uterine preservation, with long-term satisfaction comparable to UFE. In the EMMY trial, both hysterectomy and UFE resulted in substantial and sustained improvements in symptoms and health-related quality of life, though hysterectomy conferred immediate and complete elimination of bleeding and bulk-related symptoms, with high satisfaction rates persisting through 10-year follow-up (14, 18, 19). Early comparative analyses from the same trial also assessed peri-procedural recovery and found important short-term differences in pain and return to daily activities between treatment groups (22,23). Consistent with these data, the REST trial likewise demonstrated similar quality-of-life gains between uterine-artery embolization and surgery, but hysterectomy uniquely eliminates the risks of fibroid recurrence and need for reintervention (21). Observational data from the HOPEFUL cohort further support the long-term durability of hysterectomy, showing high symptom relief and patient-reported improvement over time when compared with UFE (37,42). Overall certainty is moderated by imprecision and variation in outcome definitions across studies, but the consistency of longer-term findings supports hysterectomy as a highly effective option for appropriately selected patients prioritizing definitive therapy. For appropriately selected patients prioritizing definitive therapy, these data reinforce hysterectomy as a highly effective option with outcomes that remain stable for a decade or longer.

IV.1.2 Re-intervention

Clinical Care Recommendation:

3. Patients should be counseled that the risk of re-intervention appears higher after UFE than after some myomectomy strategies, particularly beyond the first postoperative year.

CCR Strength: Moderate

GRADE Certainty: Moderate (multiple RCTs and observational studies; consistent direction of effect despite varying quality)

Summary of the evidence: Meta-analyses and large cohort studies consistently demonstrate that the risk of subsequent re-intervention is higher following UFE than after many myomectomy strategies, with differences becoming more apparent beyond the first postoperative year. Systematic reviews pooling randomized and observational data report higher cumulative rates of repeat intervention or hysterectomy after UFE compared with myomectomy over medium- and long-term follow-up (9,11). These findings are supported by large population-based and integrated health system analyses showing persistently higher long-term re-intervention hazards following UFE relative to surgical leiomyoma treatment (25). Randomized trial data, including the NEJM study by Edwards et al., similarly observed greater need for additional procedures after embolization, with divergence increasing over time rather than being confined to the early postoperative period (21). Importantly, re-intervention risk varies by myomectomy approach, fibroid burden, age, and reproductive intent, and some contemporary comparative cohorts report smaller or nonsignificant differences in selected populations (28). Currently, studies do not assess for inadvertent biases based on an individual patient's willingness to consider a surgery after embolization compared with a patient considering a second surgical intervention.

Overall, while symptom relief and satisfaction remain high after UFE, these data support counseling patients regarding a higher long-term likelihood of additional intervention relative to certain surgical approaches.

IV.1.3 Adverse events and recovery

Clinical Care Recommendations:

4. **When discussing peri-procedural risks and recovery profiles with patients, it should be noted that serious adverse event (SAE) rates are generally low and similar between UFE and surgery in available trials, though estimates are imprecise.**

CCR Strength: Limited

GRADE Certainty: Low (≥2 low-quality studies; small samples; imprecision)

Summary of the evidence: Comparative randomized and observational studies evaluating peri-procedural safety demonstrate that serious adverse events following UFE and surgical

management are uncommon and occur at similar overall rates, although individual event types differ by treatment modality (15,24). Reported SAEs across trials are infrequent, limiting the precision of effect estimates and precluding reliable detection of small between-group differences (20). Surgical cohorts more commonly experience perioperative complications related to anesthesia, blood loss, or wound morbidity, whereas UFE is associated with post-embolization pain, transient inflammatory symptoms, and rare ischemic complications (23,24). Across studies, definitions and reporting of SAEs vary substantially, and sample sizes are often insufficient to support definitive comparative safety conclusions (21). As a result, while available evidence suggests broadly comparable serious complication rates, uncertainty remains, supporting cautious interpretation and individualized counseling regarding peri-procedural risks and recovery expectations (15,24).

5. **Consistently across clinical trials and observation cohorts, UFE is associated with shorter hospital stays and faster return to normal activity compared with surgical alternatives.**

CCR Strength: Moderate
GRADE Certainty: Moderate (multiple RCTs and observational studies)

Summary of the evidence: Multiple randomized controlled trials and large observational cohorts consistently demonstrate that UFE is associated with shorter hospital length of stay and more rapid return to normal activities compared with surgical management of uterine fibroids. Across comparative studies, patients undergoing UFE experience lower early postprocedural pain and faster functional recovery, while overall serious adverse event rates remain low and comparable between treatment modalities (21,34). Randomized data from the EMMY trial and additional trials demonstrate reduced hospitalization and earlier resumption of daily activities following UFE relative to hysterectomy, with differences most pronounced in the early postprocedural period (22,23). These findings are reinforced by observational evidence, including the HOPEFUL multicenter cohort and large database analyses, which similarly report shorter hospital stays and lower early morbidity after UFE compared with hysterectomy (37,42). Although recovery metrics and assessment time points vary across studies, the consistency of results across randomized and real-world data supports counseling patients that UFE generally affords a faster recovery trajectory than surgical alternatives.

IV.1.4 Patient satisfaction

Clinical Care Recommendation:

6. **Patients should be informed that overall satisfaction is high and comparable between UFE and surgery through long-term follow-up.**

CCR Strength: Moderate

GRADE Certainty: Moderate (≥2 moderate-quality studies; consistent findings)

Summary of the evidence: Long-term follow-up from randomized trials demonstrates that overall patient satisfaction after uterine artery embolization (UFE) is high and comparable to that achieved with hysterectomy. In the EMMY trial, women undergoing either UFE or hysterectomy reported sustained improvements in symptom control and health-related quality of life, with satisfaction rates remaining high at 2 years and persisting through 10-year follow-up (14,18,19). Across EMMY publications, long-term perceptions of symptom relief, treatment success, and overall satisfaction did not differ significantly between treatment groups, despite higher rates of subsequent reintervention among UFE-treated patients (18,22). Notably, patient-reported satisfaction appears more closely linked to durable symptom improvement than to treatment modality or need for additional procedures. Although study populations and satisfaction instruments vary, the consistency of long-term findings across randomized and observational data supports counseling patients that both UFE and surgery provide durable benefit with high overall satisfaction, enabling individualized decision-making based on patient preferences and reproductive goals (14).

IV.1.5 Cost and economic impact (payer perspective)

Clinical Care Recommendation:

7. **Include cost considerations in shared decision-making: UFE procedure costs are often lower than hysterectomy or myomectomy, while 12-month total payer costs are generally similar across options.**

CCR Strength: Moderate

GRADE Certainty: Moderate (≥2 moderate-quality cost analyses; consistent direction)

Summary of the evidence: Economic analyses indicate that cost considerations are relevant when counseling patients about treatment options for symptomatic uterine fibroids. Across multiple studies, procedural costs for UFE are frequently lower than those for hysterectomy or myomectomy, largely reflecting shorter hospital stays, reduced operating room utilization, and less intensive perioperative care (51). However, analyses incorporating follow-up care and 12-month total payer costs generally demonstrate similar overall expenditures across UFE and surgical options (51-56), as downstream costs related to readmissions, complications, and additional interventions tend to offset initial procedural savings (PMID: 21343478, 29678486). Cost-effectiveness findings are sensitive to assumptions regarding reintervention rates, length of follow-up, and healthcare system context. While available studies are heterogeneous in design and costing methodology, the consistent direction of findings supports inclusion of cost considerations within shared decision-making discussions rather than privileging any single modality on economic grounds alone.

IV.2 KQ 2 — In patients who are interested in future fertility, what are the reproductive outcomes of UFE compared to myomectomy?

Clinical Care Recommendations:

8. **Myomectomy may be considered over UFE for patients whose primary goal is future pregnancy or live birth.**

CCR Strength: Limited
GRADE Certainty: Very low (heterogeneous studies, largely observational with bias)

Summary of the evidence: Available comparative evidence suggests that myomectomy may be associated with higher clinical pregnancy and live-birth rates and lower miscarriage rates than UFE among patients pursuing future fertility, although overall certainty remains very low. A recent systematic review and meta-analysis reported consistently favorable reproductive outcomes following myomectomy compared with UFE across heterogeneous study designs, with lower cumulative pregnancy and live-birth rates observed after embolization (13). Most included studies are observational, subject to substantial selection bias, and limited by small

sample sizes, variable fertility definitions, and inconsistent adjustment for fibroid characteristics and baseline reproductive risk. Additionally, fertility outcomes after UFE may be influenced by factors such as ovarian reserve, fibroid location, and need for subsequent interventions, which are incompletely captured in available datasets. As a result, while the direction of evidence favors myomectomy for patients whose primary goal is conception or live birth, the low certainty of data supports cautious interpretation and individualized counseling within shared decision-making.

9. **It may be reasonable that patients are advised that short-term ovarian reserve (AMH/FSH) appears broadly similar after UFE and myomectomy in small studies. The evidence is limited and heterogeneous and age strongly modifies risk.**

CCR Strength: Limited
GRADE Certainty: Low to very low (observation, indirectness, risk of bias)

Summary of the evidence: Evidence from small randomized and prospective comparative studies suggests that short-term ovarian reserve, as assessed by serum AMH and FSH, appears broadly similar following UFE and myomectomy (31,32), although the certainty of this evidence is low to very low. A randomized comparison reported no significant differences in early postoperative AMH decline between treatment groups, with modest changes observed in both arms and more pronounced declines among older patients (31). Prospective cohort data likewise demonstrate comparable short-term AMH and FSH trajectories after UFE and laparoscopic myomectomy, while highlighting substantial inter-individual variability and an increased likelihood of diminished ovarian reserve with advancing age (38). Earlier prospective studies similarly found no meaningful short-term differences in biochemical ovarian function between UFE and myomectomy, though greater declines were observed after hysterectomy and among women in older age strata (17). Collectively, these studies are limited by small sample sizes, short follow-up, heterogeneity in hormonal assays, and residual confounding, but consistently identify age as a dominant modifier of ovarian reserve outcomes. Accordingly, patients should be counseled that while short-term ovarian reserve appears similar between UFE and myomectomy in available studies, uncertainty remains and individualized risk assessment is essential.

10. **It is recommended that shared decision-making explicitly weigh the uncertain comparative live-birth data, potential for non-target ovarian impact after UFE (especially with advancing age), and the established uterine cavity restoration advantages of myomectomy for cavity-distorting fibroids.**

    CCR strength: Strong
    GRADE certainty: N/A (consensus)

    Summary of evidence: Shared decision-making should explicitly incorporate the limited and uncertain comparative evidence on live-birth outcomes, potential ovarian effects, and anatomic considerations that differ between UFE and myomectomy. A recent systematic review and meta-analysis demonstrated that available pregnancy and live-birth data are heterogeneous, low in certainty, and insufficient to establish equivalence between treatments, with several studies suggesting lower conception and live-birth rates following UFE (13). Small comparative studies evaluating ovarian reserve indicate that short-term AMH and FSH trajectories may be broadly similar after UFE and myomectomy, but advancing age appears to increase susceptibility to non-target ovarian impact following embolization (31,38). In contrast, myomectomy offers a clear structural advantage for patients with cavity-distorting fibroids by directly restoring more normal uterine anatomy, a well-established determinant of fertility potential. Importantly, fertility-related outcomes are influenced by multiple interacting factors—including age, fibroid size and location, baseline ovarian reserve, and need for reintervention—that are inconsistently captured in existing studies. Given these uncertainties and the primacy of patient-specific reproductive goals, a multidisciplinary approach engaging interventional radiology, gynecologic surgery, and reproductive specialists is essential to support informed, values-based decision-making.

11. **Evidence is insufficient to determine whether, among women with a prior myomectomy, UFE or repeat myomectomy yields better reproductive outcomes. Treatment recommendation should be individualized based on clinical presentation, anatomic considerations, and patient values.**

CCR Strength: Limited

GRADE certainty: Insufficient/very low

Summary of evidence: Current evidence is insufficient to determine whether UFE or repeat myomectomy yields superior reproductive outcomes among women with a history of prior myomectomy. A recent systematic review and meta-analysis underscores the marked paucity of comparative fertility data in this population, with available studies being few, heterogeneous in design, and limited by substantial selection bias and inconsistent outcome definitions (13). Existing reports often fail to adequately account for important modifiers such as fibroid size and location, extent of uterine cavity distortion, integrity of prior uterine scars, and baseline fertility risk, further limiting interpretability. In addition, cumulative procedural risk varies considerably across patients and is not systematically captured in current datasets. This includes surgical complexity with repeat myomectomy and potential non-target ischemic effects with UFE. Given these evidence gaps, treatment decisions should be individualized and guided by detailed anatomic assessment, reproductive priorities, and patient values. Multidisciplinary input from gynecologic surgeons, interventional radiologists, and reproductive specialists may help optimize counseling and align management with patient-specific goals in the absence of definitive comparative data.

IV.3 KQ 3 — In patients with symptomatic fibroids, what is the effectiveness of UFE compared to MRguided focused ultrasound (MRgFUS)?

Clinical Care Recommendations:

12. **For patients prioritizing durable symptom control, UFE can be recommended over MRgFUS because UFE is associated with substantially lower re-intervention through 1–5 years.**

CCR Strength: Moderate

GRADE Certainty: Low (observation, risk of bias, consistent direction of evidence)

Summary of the evidence: Comparative evidence consistently demonstrates that UFE provides more durable symptom control than MRgFUS, largely driven by substantially lower re-

intervention rates over 1–5 years. Systematic reviews and meta-analyses show that MRgFUS is associated with the highest likelihood of repeat treatment among minimally invasive fibroid therapies, whereas UFE achieves more sustained symptom relief through more complete and durable fibroid devascularization (9,11). Although MRgFUS can yield short-term improvements in symptoms and quality of life, its effectiveness is constrained by treatment volume limitations, fibroid accessibility, and a higher probability of subsequent intervention (33). Medium-term quality-of-life outcomes after UFE remain stable and comparable to other definitive therapies, reinforcing its durability advantage when symptom control is prioritized (11). The certainty of evidence is limited by the predominance of observational data and potential selection bias; however, the consistent direction of findings across multiple pooled analyses supports recommending UFE over MRgFUS for patients seeking durable symptom relief.

13. **If a patient's short-term symptom score improvement is prioritized over long-term durability, MRgFUS may provide larger 12-month symptom score gains when compared to UFE. This should be discussed alongside its higher re-intervention risk.**

CCR Strength: Limited
GRADE Certainty: Very Low (observational, risk of bias)

Summary of the evidence: Comparative meta-analyses suggest that MRgFUS may yield greater short-term improvements in symptom severity scores at 6–12 months compared with UFE, which may be meaningful for patients prioritizing early symptom relief (9,11). These early gains likely reflect the rapid symptomatic response associated with focused thermal ablation, despite the more limited treatment volume achievable with MRgFUS. However, across pooled analyses, MRgFUS is consistently associated with substantially higher re-intervention rates than UFE, indicating reduced durability of symptom control over time (9,11,12). As a result, initial symptom score advantages diminish when longer follow-up is considered, whereas UFE demonstrates more sustained benefit. The evidence base is limited by observational designs, potential selection bias, and heterogeneity in symptom assessment tools, contributing to very low certainty. Accordingly, patients should be counseled that MRgFUS may offer greater short-term symptom improvement but at the expense of a higher likelihood of subsequent treatment

compared with UFE. Though included in the searches, there is currently no high-level evidence regarding RFA.

14. **For patients actively pursuing future pregnancy or desiring to preserve ovarian reserve, the evidence is insufficient to recommend one modality (UFE or MRgFUS) over the other.**

CCR Strength: Limited
GRADE Certainty: Very Low (Observational, risk of bias)

Summary of the evidence: Available evidence is insufficient to determine whether UFE or MRgFUS is preferable for patients prioritizing future pregnancy or preservation of ovarian reserve. Comparative meta-analyses report no statistically significant differences in pregnancy outcomes between modalities; however, these findings are based on sparse data from small, uncontrolled cohorts with substantial heterogeneity and high risk of bias (11). Broader pooled analyses evaluating multiple fibroid treatments similarly conclude that fertility-related outcomes for UFE and MRgFUS cannot be reliably compared due to inconsistent definitions of pregnancy intent, variable follow-up duration, and limited numbers of reported reproductive events (9). More recent syntheses focusing on MRgFUS highlight persistent uncertainty regarding its reproductive safety and comparative effectiveness, particularly with respect to ovarian reserve and live-birth outcomes (12). In addition, important modifiers such as patient age, baseline ovarian reserve, fibroid location, and need for subsequent intervention are inconsistently captured across studies. Given these limitations, no modality can be preferentially recommended for patients actively pursuing conception or ovarian preservation, and individualized counseling remains essential.

IV.3 – SUMMARY RECOMMENDATION

15. **Shared decision-making is the preferred approach for patients with symptomatic**

uterine fibroids to ensure that treatment selection is individualized and aligned with personal goals, including future reproductive plans. Choices among surgical options, UFE, and MRgFUS should reflect both patient preferences and local clinical expertise.

CCR Strength: Strong
GRADE Certainty: N/A (Consensus)

Summary of the evidence: Shared decision-making is the preferred approach for patients with symptomatic uterine fibroids because available evidence demonstrates meaningful trade-offs among surgical management, UFE, and MRgFUS. Comparative studies show that all modalities can improve symptoms and quality of life, but they differ with respect to durability of symptom control, risk of reintervention, recovery profiles, and implications for future reproductive plans (15,17). Fertility-related outcomes in particular remain uncertain and heterogeneous across treatment options, limiting the ability to identify a universally optimal approach for patients desiring pregnancy. Broader evaluations incorporating recurrence, quality of life, and subsequent procedures further highlight that treatment effectiveness is highly context dependent and influenced by fibroid characteristics, patient age, and baseline reproductive goals. Given these trade-offs and persistent evidence gaps, individualized counseling that integrates patient preferences, reproductive priorities, local availability and procedural expertise is essential to support informed, values-concordant treatment selection.

V. DISCUSSION

Research Opportunities: Persistent Themes for Future UFE Research

The current evidence base for uterine fibroid embolization (UFE) and its comparators is characterized by heterogeneity in study design, variability in outcome definitions, short follow-up durations, and inconsistent reporting of key endpoints across treatment arms. These limitations have resulted in mixed-to-low certainty evidence for many clinical questions and underscore the need for higher-quality data to inform patient-centered decision-making (9,11-13). A thematic reorganization of research priorities highlights several cross-cutting areas that warrant concerted investigation.

Robust comparative effectiveness research remains a central priority. While existing randomized controlled trials and observational cohorts have compared UFE with hysterectomy or myomectomy, they often lack adequate power, have inconsistent eligibility criteria, and provide variable long-term durability data. Trials such as EMMY and others have shown that UFE and surgical treatments can produce similar symptom relief, but with different profiles for recovery time, re-intervention rates, and side effects (14, 18-20). Future studies should therefore adopt pragmatic, head-to-head designs that evaluate UFE separately against hysterectomy, myomectomy, and other minimally invasive technologies using prespecified core outcomes that include validated symptom change measures, health-related quality of life, time to return to usual activities, re-intervention rates, and standardized adverse event reporting. Such trials should apply standardized imaging eligibility criteria and centralized adjudication to reduce selection bias and improve generalizability.

Capturing outcomes that matter most to patients remains equally important. Patient-reported outcomes, including detailed symptom measures, menstrual bleeding profiles, sexual function, decisional quality, and long-term satisfaction, are inconsistently reported in existing studies, limiting the ability to contextualize clinical effects from the patient perspective. Embedding these measures routinely into future research will ensure that comparisons among treatment options reflect the lived experience of patients with symptomatic fibroids.

Fertility and reproductive outcomes represent another persistent theme in research planning. While both myomectomy and UFE are considered fertility-sparing, the quality of evidence comparing reproductive endpoints is limited, and reproductive outcomes after UFE remain uncertain. Observational and meta-analytic data suggest that fertility parameters after UFE vary across studies, and some suggest lower pregnancy rates compared with myomectomy (13,17). Standardized, long-term assessment of reproductive endpoints such as live birth, time to pregnancy, miscarriage, ectopic pregnancy, and neonatal outcomes is necessary to provide definitive comparative data. Additionally, systematic evaluation of ovarian reserve and reproductive endocrine function following UFE will help clarify potential mechanisms and inform counseling for patients with reproductive goals.

Evaluating the cost, utilization patterns, and equity of UFE is another essential research domain. Comprehensive economic analyses that capture cost per quality-adjusted life year (QALY), cost per

re-intervention avoided, recovery-related costs, and societal impacts at multiple time horizons will provide insights into the value proposition of UFE relative to surgical and other minimally invasive options. Evidence also indicates substantial disparities in UFE utilization across sociodemographic factors, with UFE underutilized relative to hysterectomy and myomectomy and significant differences by insurance status, race/ethnicity, and geography (54,58). Further research should therefore integrate equity-focused analyses and health services research to understand and address barriers to equitable access.

Emerging technologies and methodological innovations offer additional avenues to strengthen the evidence base. Newer minimally invasive therapies represent a meaningful and growing proportion of uterus-sparing fibroid interventions in clinical practice. Prospective single-arm and limited comparative studies of transcervical ablation devices demonstrate improvements in bleeding symptoms and quality of life, but these studies are constrained by short follow-up, selective enrollment criteria, limited reporting of durability and re-intervention, and insufficient characterization of reproductive outcomes (47-49). Given their increasing use, formal comparative evaluation is critically needed. Head-to-head trials comparing these technologies with UFE and traditional surgical approaches, using standardized imaging eligibility criteria, prespecified crossover and re-intervention rules, and comprehensive core outcome sets that include UFS-QoL, durability through multiple years, recovery metrics, fertility-related endpoints, and economic evaluations will be essential to generate evidence that can inform patient-centered decision-making and future guideline updates.

By organizing future research needs around these thematic priorities like comparative effectiveness, patient-centered outcomes, reproductive effects, cost and equity, and technology evaluation, investigators and funders can better align study design with clinician and patient needs. Strategic alignment on core outcomes, standardized methods, and multidisciplinary collaboration will accelerate the generation of high-quality evidence that can refine care pathways and support individualized treatment decisions for women with symptomatic uterine fibroids.

VI. Conclusion

UFE is an established, uterus-sparing therapy that provides durable symptom improvement, high patient satisfaction, and recovery advantages that are meaningful to many patients with

symptomatic fibroids. The evidence supports offering UFE alongside surgical and other minimally invasive options within shared decision-making that incorporates patient goals, reproductive priorities, anatomic considerations, and local expertise. Additional high-quality comparative research addressing fertility outcomes, long-term durability, cost-effectiveness, and emerging technologies will be essential to refine patient selection and strengthen future recommendations.

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Appendix A: Uterine Fibroid Embolization Clinical Practice Guideline Key Clinical Questions with Inclusion and Exclusion Criteria

1. In patients with symptomatic fibroids, what is the effectiveness of UFE compared to surgical intervention?		
	Inclusion Criteria	**Exclusion Criteria**
Population	Women with symptomatic uterine fibroids	
Intervention	Uterine fibroid embolization	
Comparator	Surgical intervention (myomectomy, hysterectomy, ligation, etc.)	Hysteroscopic resection
Outcomes	• Symptom improvement (as judged by symptom score of UFS QoL, QoL changes from other QoL instruments; menstrual bleeding, pain) • Patient satisfaction • Re-intervention (defined as additional gynecologic intervention due to any cause at any time frame) • Adverse events (as reported in studies) • Cost-effectiveness	
Time Frame	Any—stratify analysis by time frame, if applicable	
Study Design	RCTs Observational studies with two arms (retrospective and prospective cohorts, case-control) National database studies (with 2 arms)	Non-comparative studies (i.e. single-arm cohort, case series, etc.) Non-systematic reviews

2. In patients who are interested in future fertility, what are the reproductive outcomes of UFE compared to myomectomy?		
	Inclusion Criteria	**Exclusion Criteria**
Population	Patients with symptomatic fibroids who are interested in future fertility (subgroup -- Patients who have had prior myomectomy)	
Intervention	UFE	
Comparator	myomectomy	

Outcomes	Reproductive outcomes (number and outcome of pregnancies, ovarian failure) Ovarian reserve [change in follicle stimulating hormone (FSH) level, anti-Mullerian hormone (AMH) level, follicle count]	
Time Frame	Any—stratify analysis by time frame, if applicable	
Study Design	RCTs Observational studies with two arms (retrospective and prospective cohorts, case-control) National database studies (with 2 arms)	Non-comparative studies (i.e. single-arm cohort, case series, etc.) Non-systematic reviews

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3. In patients with symptomatic fibroids, what is the effectiveness of UFE compared to MR-guided focused ultrasound?		
	Inclusion Criteria	**Exclusion Criteria**
Population	Women with symptomatic fibroids	
Intervention	Uterine fibroid embolization	
Comparator	MR-guided focused ultrasound	
Outcomes	• Symptom improvement (as judged by symptom score of UFS QoL, QoL changes from other QoL instruments; menstrual bleeding, pain) • Patient satisfaction • Re-intervention • Reproductive outcomes • Ovarian Reserve • Cost-effectiveness • Adverse events	
Time Frame	Any—stratify analysis by time frame, if applicable	
Study Design	RCTs Observational studies with two arms (retrospective and prospective cohorts, case-control) National database studies (with 2 arms)	Non-comparative studies (i.e. single-arm cohort, case series, etc.) Non-systematic reviews

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908 Appendix B: Search Strategies

		Question 1: In patients with symptomatic fibroids, what is the effectiveness of UFE compared to surgical intervention? **Question 2: In patients who are interested in future fertility, what are the reproductive outcomes of UFE compared to myomectomy?**
Database	**PubMed**	
Set	Concept	Terms
1	Problem (Leiomas)	((Uterus[tiab] OR Uterine [tiab] OR "Myometrium"[MH] OR "Uterus"[MH]) AND (Fibroid[tiab] OR myoma[tiab])) OR Leiomyoma [tiab] OR ("Uterine Neoplasms"[MH] OR"Leiomyoma"[MH])
2	Intervention	(Embolization [tiab] OR Embolotherapy [tiab] OR Embolotherapies [tiab] OR "Uterine Artery Embolization"[MH] OR "Embolization, Therapeutic"[MH])
3	Comparator	(Myomectomy [tiab] OR Hysterectomy [tiab] OR Surgery [tiab] OR Surgical [tiab] OR Fibroidectomy [tiab] OR Ablation [tiab] OR Hysteroscopic resection [tiab] OR "Uterine Myomectomy"[mh] OR "Gynecologic Surgical Procedures"[Mh] OR "Hysterectomy"[Mh] OR "Endometrial Ablation Techniques"[Mh] OR "Hysteroscopy"[Mh])
4	Study Design	"Randomized control trial" OR Random OR Randomized OR Control or Observational OR Natural OR Naturalistic OR Retrospective OR Prospective OR "Data base" OR "data bases" OR "Data bank" OR Registry OR Retrospective OR Prospective OR Cohort OR Case-Control OR "Randomized Controlled Trials as Topic"[Mesh] OR "Randomized Controlled Trial" [Publication Type] OR "Observational Study" [Publication Type] OR "Observational Studies as Topic"[Mesh] OR "Databases as Topic"[Mesh] OR "Registries"[Mesh] OR "Case-Control Studies"[Mesh] OR "Retrospective Studies"[Mesh] OR "Cohort Studies"[Mesh] OR "Prospective Studies"[Mesh] OR "Follow-Up Studies"[Mesh] OR "Treatment Outcome"[Mesh]
5		#1 and #2 and #3 and #4
Database	**EMBASE**	
Set	Concept	Terms
1	Problem	((('uterus'/exp OR uterus OR 'uterine'/exp OR uterine OR myometri*) AND ('fibroid'/exp OR fibroid OR 'myoma'/exp OR myoma)) OR 'leiomyoma'/exp OR leiomyoma OR 'uterus myoma'/exp OR 'uterus myoma')
2	Intervention	Embolization OR Embolotherapy OR Embolotherapies OR 'uterine artery embolization' OR 'arterial embolization'/exp
3	Comparator	myomectomy OR hysterectomy OR surgery OR fibroidectomy OR ablation OR (hysteroscopic AND resection) OR 'myomectomy'/exp OR 'hysterectomy'/exp
4		#1 AND #2 AND #3

5	Study Design	(((Random* AND Control*) OR Observation* OR Database OR Registry OR Retrospective OR Prospective OR Natural OR Naturalistic OR Cohort OR Case-Control) AND (Trial OR Study)) OR ('randomized controlled trial'/exp) OR ('observational study'/exp) OR ('comparative study'/exp) OR ('controlled study'/exp) OR ('clinical trial'/exp) OR ('clinical study'/exp) OR ('retrospective study'/exp) OR ('treatment outcome'/exp)
6		#4 AND #5
Database	Cochrane	Search
		1 MeSH descriptor: [Leiomyoma] explode all trees 2 MeSH descriptor: [Myoma] explode all trees 3 Leiomyoma 4 Myoma 5 Fibroid 6 #1 OR #2 OR #3 OR #4 OR #5 7 MeSH descriptor: [Hysterectomy] explode all trees 8 MeSH descriptor: [Uterine Artery Embolization] explode all trees 9 MeSH descriptor: [Embolization, Therapeutic] explode all trees 10 Embolization 11 MeSH descriptor: [Uterine Myomectomy] explode all trees 12 #7 OR #8 OR #9 OR #10 OR #11 13 #6 AND #12

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		Question 3 In patients with symptomatic fibroids, what is the effectiveness of UFE compared to MR-guided focused ultrasound or fibroid ablation?
Database	**PubMed**	
Set	Concept	Terms
1	Problem (Leiomas)	((Uterus[tiab] OR Uterine [tiab] OR "Myometrium"[MH] OR "Uterus"[MH]) AND (Fibroid[tiab] OR myoma[tiab])) OR Leiomyoma [tiab] OR ("Uterine Neoplasms"[MH] OR"Leiomyoma"[MH])
2	Intervention	(Embolization [tiab] OR Embolotherapy [tiab] OR Embolotherapies [tiab] OR "Uterine Artery Embolization"[MH] OR "Embolization, Therapeutic"[MH])

3	Comparator	(((Fibroid OR Transcervical fibroid OR Transcervical OR radiofrequency Laparoscopic OR Sonography-guided OR Ultrasound-guided OR HIFU OR High intensity focused ultrasound) AND Ablation) OR Sonata OR Acessa) OR "Radiofrequency Ablation"[Mesh] OR "High-Intensity Focused Ultrasound Ablation"[Mesh] OR "Ablation Techniques"[Mesh]
4		#1 and #2 and #3
5	Study Design	"Randomized control trial" OR Random OR Randomized OR Control or Observational OR Natural OR Naturalistic OR Retrospective OR Prospective OR "Data base" OR "data bases" OR "Data bank" OR Registry OR Retrospective OR Prospective OR Cohort OR Case-Control OR "Randomized Controlled Trials as Topic"[Mesh] OR "Randomized Controlled Trial" [Publication Type] OR "Observational Study" [Publication Type] OR "Observational Studies as Topic"[Mesh] OR "Databases as Topic"[Mesh] OR "Registries"[Mesh] OR "Case-Control Studies"[Mesh] OR "Retrospective Studies"[Mesh] OR "Cohort Studies"[Mesh] OR "Prospective Studies"[Mesh] OR "Follow-Up Studies"[Mesh] OR "Treatment Outcome"[Mesh]
6		4 and 5
Database	**EMBASE**	
Set	Concept	Terms
1	Problem	((('uterus'/exp OR uterus OR 'uterine'/exp OR uterine OR myometri*) AND ('fibroid'/exp OR fibroid OR 'myoma'/exp OR myoma)) OR 'leiomyoma'/exp OR leiomyoma OR 'uterus myoma'/exp OR 'uterus myoma')
2	Intervention	Embolization OR Embolotherapy OR Embolotherapies OR 'uterine artery embolization' OR 'arterial embolization'/exp
3	Comparator	(((Fibroid OR Transcervical fibroid OR Transcervical OR radiofrequency Laparoscopic OR Sonography-guided OR Ultrasound-guided OR HIFU OR High intensity focused ultrasound) AND Ablation) OR Sonata OR Acessa) OR 'radiofrequency ablation'/exp OR 'high intensity focused ultrasound'/exp OR 'ablation therapy'/exp
4		#1 AND #2 AND #3

5	Study Design	(((Random* AND Control*) OR Observation* OR Database OR Registry OR Retrospective OR Prospective OR Natural OR Naturalistic OR Cohort OR Case-Control) AND (Trial OR Study)) OR ('randomized controlled trial'/exp) OR ('observational study'/exp) OR ('comparative study'/exp) OR ('controlled study'/exp) OR ('clinical trial'/exp) OR ('clinical study'/exp) OR ('retrospective study'/exp) OR ('treatment outcome'/exp)
6		4 and 5
Database	Cochrane	Search
		1 MeSH descriptor: [Leiomyoma] explode all trees 2 MeSH descriptor: [Myoma] explode all trees 3 Leiomyoma 4 Myoma 5 Fibroid 6 #1 OR #2 OR #3 OR #4 OR #5 7 "high intensity focused ultrasound" 8 "magnetic resonance-guided focused ultrasound" 9 "magnetic resonance-guided high-intensity focused ultrasound" 10 "hifu" 11 "fus" 12 #7 OR #8 OR #9 OR #10 OR #11 13 #6 AND #12

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Appendix C. List of Excluded Studies with Reasons for Exclusion

TABLE C-1. LIST OF THE EXCLUDED STUDIES WITH REASONS FOR EXCLUSION

Study ID	Full Citation	Reasons for Exclusion
Key Question 1 and 2		
Mitro, 2024	Mitro, S.D., et al., Long-Term Risk of Reintervention After Surgical Leiomyoma Treatment in an Integrated Health Care System. Obstet Gynecol, 2024. 143(5): p. 619-626.	Duplicate
Amoah, 2023	Amoah, A. and S.D. Quinn, Uterine-preserving treatments or hysterectomy reintervention after myomectomy or uterine artery embolisation: A retrospective cohort study of long-term outcomes. Bjog, 2023. 130(7): p. 823-831.	Included in Peng 2024
Anchan, 2023 (1)	Anchan, R.M., et al., Long-term health-related quality of life and symptom severity following hysterectomy, myomectomy, or uterine artery embolization for the treatment of symptomatic uterine fibroids. Am J Obstet Gynecol, 2023. 229(3): p. 275.e1-275.e17.	Included in Peng 2024
Anchan, 2023 (2)	Anchan, R.M., et al., A Comparative Analysis of Health-Related Quality of Life 1 Year Following Myomectomy or Uterine Artery Embolization: Findings from the COMPARE-UF Registry. J Womens Health (Larchmt), 2023. 32(4): p. 423-433.	1 year follow up of COMPARE-UF, which is already included in Peng 2024
Mitro, 2023	Mitro, S.D., et al., LONG-TERM RISK OF REINTERVENTION AFTER UTERINE PRESERVING SURGICAL FIBROID TREATMENTS AND VARIATION BY SOCIODEMOGRAPHIC FACTORS. Fertility and Sterility, 2023. 120(4): p. e89.	Conference proceeding
Sirkeci, 2023	Sirkeci, F., et al., Effects on heavy menstrual bleeding and pregnancy of uterine artery embolization (UAE) or myomectomy for women with uterine fibroids wishing to avoid hysterectomy: The FEMME randomized controlled trial. Int J Gynaecol Obstet, 2023. 160(2): p. 492-501.	Included in Peng 2024
Zaritsky, 2023	Zaritsky, E., et al., Long-Term Risk of Reintervention after Uterine Preserving Surgical Fibroid Treatments and Variation by Sociodemographic Factors. Journal of Minimally Invasive Gynecology, 2023. 30(11): p. S5-S6.	Conference proceeding
Allameh, 2022	Allameh, Z., et al., Evaluation of the Efficacy and Complications of Uterine Artery Embolization in Comparison with Laparotomy-Myomectomy in the Treatment of Uterine Myomas: A Randomized Clinical Trial. Med J Islam Repub Iran, 2022. 36: p. 87.	Included in Peng 2024
Daniels, 2022	Daniels, J., et al., Uterine artery embolisation versus myomectomy for premenopausal women with uterine fibroids wishing to avoid hysterectomy: the FEMME RCT. Health Technol Assess, 2022. 26(22): p. 1-74.	Included in Peng 2024
Daniels, 2022	Daniels, J., et al., Uterine artery embolization or myomectomy for women with uterine fibroids: Four-year follow-up of a randomised controlled trial. Eur J Obstet Gynecol Reprod Biol X, 2022. 13: p. 100139.	Included in Peng 2024
Lim, 2022	Lim, S.L., et al., Healthcare Cost and Utilization of Uterus-Sparing Interventions in Women with Uterine Fibroids: A Retrospective Claims Analysis. Journal of Minimally Invasive Gynecology, 2022. 29(11): p. S1-S2.	Conference proceeding
Rana, 2021	Rana, D., et al., Uterine artery embolisation or myomectomy for women with uterine fibroids wishing to avoid hysterectomy: a cost-utility analysis of the FEMME trial. Bjog, 2021. 128(11): p. 1793-1802.	Economic

Study ID	Full Citation	Reasons for Exclusion
Cronan, 2020	Cronan, J., et al., Invasive Procedural Treatments for Symptomatic Uterine Fibroids: A Cost Analysis. Journal of the American College of Radiology, 2020. 17(10): p. 1237-1244.	Economic
Harrington, 2020	Harrington, A., et al., Direct Costs Incurred Among Women Undergoing Surgical Procedures to Treat Uterine Fibroids. J Manag Care Spec Pharm, 2020. 26(1-a Suppl): p. S2-s10.	Economic
Manyonda, 2020	Manyonda, I., et al., Uterine-Artery Embolization or Myomectomy for Uterine Fibroids. N Engl J Med, 2020. 383(5): p. 440-451.	Included in Peng 2024
Wang, 2020	Wang, C., et al., Utilization of Endovascular and Surgical Treatments for Symptomatic Uterine Leiomyomas: A Population Health Perspective. J Vasc Interv Radiol, 2020. 31(10): p. 1552-1559.e1.	Economic
Laughlin-Tommaso, 2019	Laughlin-Tommaso, S., et al., FIRSTT study: randomized controlled trial of uterine artery embolization vs. focused ultrasound surgery. Am J Obstet Gynecol, 2019. 220(2): p. 174.e1-174.e13.	Included in Liu 2021
Laughlin-Tommaso, 2019	Laughlin-Tommaso, S., et al., FIRSTT study: randomized controlled trial of uterine artery embolization vs. focused ultrasound surgery. Am J Obstet Gynecol, 2019. 220(2): p. 174.e1-174.e13.	Duplicate
Bonafede, 2018	Bonafede, M.M., et al., Women with Newly Diagnosed Uterine Fibroids: Treatment Patterns and Cost Comparison for Select Treatment Options. Popul Health Manag, 2018. 21(S1): p. S13-s20.	Economic
Davis, 2018	Davis, M.R., et al., Reintervention Rates after Myomectomy, Endometrial Ablation, and Uterine Artery Embolization for Patients with Uterine Fibroids. Journal of Women's Health, 2018. 27(10): p. 1204-1214.	Included in Xu 2021
Davis, 2018	Davis, M.R., et al., Reintervention Rates after Myomectomy, Endometrial Ablation, and Uterine Artery Embolization for Patients with Uterine Fibroids. Journal of Women's Health, 2018. 27(10): p. 1204-1214.	Duplicate
Friedman, 2018	Friedman, J., et al., Pregnancy Outcomes Following Fertility-Sparing Treatments of Uterine Fibroids. Journal of Minimally Invasive Gynecology, 2018. 25(7): p. S92-S93.	Conference proceeding
Glaser, 2018	Glaser, L.M., et al., Miscarriage Following Different Routes of Fertility-Sparing Treatment of Uterine Fibroids. Journal of Minimally Invasive Gynecology, 2018. 25(7): p. S83.	Conference proceeding
Sandberg, 2018	Sandberg, E.M., et al., Reintervention risk and quality of life outcomes after uterine-sparing interventions for fibroids: a systematic review and meta-analysis. Fertil Steril, 2018. 109(4): p. 698-707.e1.	More recent SRs available for both reintervention (Liu 2021) and QoL (Xu 2021) outcomes
Sandberg, 2018	Sandberg, E.M., et al., Reintervention risk and quality of life outcomes after uterine-sparing interventions for fibroids: a systematic review and meta-analysis. Fertility and Sterility, 2018. 109(4): p. 698-707.e1.	Duplicate
Borah, 2017	Borah, B.J., et al., Comparative Effectiveness of Uterine Leiomyoma Procedures Using a Large Insurance Claims Database. Obstet Gynecol, 2017. 130(5): p. 1047-1056.	Duplicate
Borah, 2017	Borah, B.J., et al., Comparative Effectiveness of Uterine Leiomyoma Procedures Using a Large Insurance Claims Database. Obstet Gynecol, 2017. 130(5): p. 1047-1056.	Included in Liu 2021 and Yan 2022

Study ID	Full Citation	Reasons for Exclusion
Glaser, 2017	Glaser, L.M., et al., Reproductive outcomes following minimally invasive fertility-sparing treatment of uterine fibroids. Journal of Minimally Invasive Gynecology, 2017. 24(7): p. S191-S192.	Conference proceeding
Glass Lewis, 2017	Glass Lewis, M. and O.T. Ekúndayò, Cost and Distribution of Hysterectomy and Uterine Artery Embolization in the United States: Regional/Rural/Urban Disparities. Med Sci (Basel), 2017. 5(2).	Economic
AbdElmagied, 2016	AbdElmagied, A.M., et al., Fibroid interventions: reducing symptoms today and tomorrow: extending generalizability by using a comprehensive cohort design with a randomized controlled trial. Am J Obstet Gynecol, 2016. 215(3): p. 338.e1-338.e18.	No outcomes of interest
Bonafede, 2016	Bonafede, M., et al., Healthcare costs associated with surgical interventions for uterine fibroids. Journal of Minimally Invasive Gynecology, 2016. 23(7): p. S192.	Conference proceeding
Borah, 2016	Borah, B.J., et al., Association between patient characteristics and treatment procedure among patients with uterine leiomyomas. Obstetrics and Gynecology, 2016. 127(1): p. 67-77.	No outcomes of interest
Martin-Merino, 2015	Martín-Merino, E., et al., The incidence of hysterectomy, uterus-preserving procedures and recurrent treatment in the management of uterine fibroids. Eur J Obstet Gynecol Reprod Biol, 2015. 194: p. 147-52.	No outcomes of interest
Borah, 2014	Borah, B.J., et al., Cost comparison between uterine-sparing fibroid treatments one year following treatment. J Ther Ultrasound, 2014. 2: p. 7.	Economic
Borah, 2014	Borah, B.J., et al., Cost comparison between uterine-sparing fibroid treatments one year following treatment. J Ther Ultrasound, 2014. 2: p. 7.	Economic/Duplicate
Ananthakrishnan, 2013	Ananthakrishnan, G., et al., Randomized comparison of uterine artery embolization (UAE) with surgical treatment in patients with symptomatic uterine fibroids (REST trial): subanalysis of 5-year MRI findings. Cardiovasc Intervent Radiol, 2013. 36(3): p. 676-81.	Subanalysis of REST (Moss, 2011 covers this trial, but is included in Xu 202)
Garcia Rodriguez, 2013	García Rodríguez, L.A., et al., Rates of hysterectomy (HYS), uterus-preserving procedures (UPPs) and recurrent treatment, in the management of uterine fibroids (UF) in the UK using data from the health improvement network (THIN). Fertility and Sterility, 2013. 100(3): p. S396.	Conference proceeding
Kuppermann, 2013	Kuppermann, M., et al., Contributions of hysterectomy and uterus-preserving surgery to health-related quality of life. Obstet Gynecol, 2013. 122(1): p. 15-25.	Population not of interest
Van Der Kooij, 2013	Van Der Kooij, S.M., et al., The effect of treatment preference and treatment allocation on patients' health-related quality of life in the randomized EMMY trial. European Journal of Obstetrics and Gynecology and Reproductive Biology, 2013. 169(1): p. 69-74.	Relevant outcomes already captured from other EMMY publications
Campe, 2012	Campe, C., et al., Retrospective comparative analysis of reintervention rates after laparoscopic myomectomy vs. uterine artery embolization in the treatment of symptomatic uterine fibroids. Journal of Vascular and Interventional Radiology, 2012. 23(3): p. S38.	Conference proceeding
Hickey, 2012	Hickey, M., J.L. Marino, and F.C. Brownfoot, Uterine artery embolisation associated with greater need for reintervention than surgical treatment for symptomatic uterine fibroids; quality of life similar though study underpowered. Evidence-Based Medicine, 2012. 17(3): p. 87-88.	Not a primary study (commentary)
Manyonda, 2012	Manyonda, I.T., et al., Uterine artery embolization versus myomectomy: impact on quality of life--results of the FUME (Fibroids of the Uterus: Myomectomy versus Embolization) Trial. Cardiovasc Intervent Radiol, 2012. 35(3): p. 530-6.	Included in Peng 2024

Study ID	Full Citation	Reasons for Exclusion
Mara, 2012	Mara, M., et al., Uterine artery embolization versus laparoscopic uterine artery occlusion: the outcomes of a prospective, nonrandomized clinical trial. Cardiovasc Intervent Radiol, 2012. 35(5): p. 1041-52.	Intervention not of interest
Fennessy, 2011	Fennessy, F.M., et al., Quality-of-life assessment of fibroid treatment options and outcomes. Radiology, 2011. 259(3): p. 785-792.	Duplicate
Moss, 2011	Moss, J.G., et al., Randomised comparison of uterine artery embolisation (UAE) with surgical treatment in patients with symptomatic uterine fibroids (REST trial): 5-year results. Bjog, 2011. 118(8): p. 936-44.	Included in Xu 2021
Helal, 2010	Helal, A., M. Mashaly Ael, and T. Amer, Uterine artery occlusion for treatment of symptomatic uterine myomas. Jsls, 2010. 14(3): p. 386-90.	Intervention not of interest
Narayan, 2010	Narayan, A., et al., Uterine Artery Embolization versus Abdominal Myomectomy: A Long-term Clinical Outcome Comparison. Journal of Vascular and Interventional Radiology, 2010. 21(7): p. 1011-1017.	Included in Peng 2024 and Xu 2021
Qu, 2010	Qu, X., et al., Controlled clinical trial assessing the effect of laparoscopic uterine arterial occlusion on ovarian reserve. J Minim Invasive Gynecol, 2010. 17(1): p. 47-52.	Intervention not of interest
Rashid, 2010	Rashid, S., et al., The effects of uterine artery embolisation and surgical treatment on ovarian function in women with uterine fibroids. Bjog, 2010. 117(8): p. 985-9.	Subgroup analysis of REST; groups myomectomy and hysterectomy together.
Spies, 2010	Spies, J., et al., Outcomes from fibroid therapies: A comparison with normal controls. Journal of Vascular and Interventional Radiology, 2010. 21(2): p. S22-S23.	Conference proceeding
Van Der Kooij, 2010	Van Der Kooij, S.M., et al., Uterine artery embolization vs. hysterectomy in the treatment of symptomatic uterine fibroids: 5-Year outcome from the randomized EMMY trial. American Journal of Obstetrics and Gynecology, 2010. 203(2): p. 105.e1-105.e13.	Relevant outcomes already captured from other EMMY publications
Ambat, 2009	Ambat, S., et al., Uterine artery embolization versus laparoscopic occlusion of uterine vessels for management of symptomatic uterine fibroids. Int J Gynaecol Obstet, 2009. 105(2): p. 162-5.	Intervention not of interest
Brochner, 2009	Brøchner, A.C., et al., Inflammatory response in patients undergoing uterine artery embolization as compared to patients undergoing conventional hysterectomy. Acta Radiol, 2009. 50(10): p. 1193-7.	No outcomes of interest
Hald, 2009	Hald, K., et al., Uterine artery embolization versus laparoscopic occlusion of uterine arteries for leiomyomas: long-term results of a randomized comparative trial. J Vasc Interv Radiol, 2009. 20(10): p. 1303-10; quiz 1311.	Intervention not of interest
You, 2009	You, J.H., D.S. Sahota, and P.M. Yuen, Uterine artery embolization, hysterectomy, or myomectomy for symptomatic uterine fibroids: a cost-utility analysis. Fertil Steril, 2009. 91(2): p. 580-8.	Economic
Carls, 2008	Carls, G.S., et al., What are the total costs of surgical treatment for uterine fibroids? J Womens Health (Larchmt), 2008. 17(7): p. 1119-32.	Economic
Cunningham, 2008	Cunningham, E., et al., Uterine artery embolization versus occlusion for uterine leiomyomas: a pilot randomized clinical trial. J Minim Invasive Gynecol, 2008. 15(3): p. 301-7.	Intervention not of interest
Holub, 2008	Holub, Z., et al., Pregnancy outcomes after uterine artery occlusion: prospective multicentric study. Fertil Steril, 2008. 90(5): p. 1886-91.	Intervention not of interest

Study ID	Full Citation	Reasons for Exclusion
Mara, 2008	Mara, M., et al., Midterm clinical and first reproductive results of a randomized controlled trial comparing uterine fibroid embolization and myomectomy. Cardiovasc Intervent Radiol, 2008. 31(1): p. 73-85.	Included in Peng 2024
Volkers, 2008	Volkers, N.A., et al., Economic Evaluation of Uterine Artery Embolization versus Hysterectomy in the Treatment of Symptomatic Uterine Fibroids: Results from the Randomized EMMY Trial. Journal of Vascular and Interventional Radiology, 2008. 19(7): p. 1007-1016.	Economic
Dembek, 2007	Dembek, C.J., et al., Payer Costs in Patients Undergoing Uterine Artery Embolization, Hysterectomy, or Myomectomy for Treatment of Uterine Fibroids. Journal of Vascular and Interventional Radiology, 2007. 18(10): p. 1207-1213.	Economic
Goldberg, 2007	Goldberg, J., et al., Cost and reimbursement for three fibroid treatments: Abdominal hysterectomy, abdominal myomectomy, and uterine fibroid embolization. CardioVascular and Interventional Radiology, 2007. 30(1): p. 54-58.	Economic
Hald, 2007	Hald, K., et al., Laparoscopic occlusion compared with embolization of uterine vessels: A randomized controlled trial. Obstetrics and Gynecology, 2007. 109(1): p. 20-27.	Intervention not of interest
Hehenkamp, 2007	Hehenkamp, W.J., et al., Sexuality and body image after uterine artery embolization and hysterectomy in the treatment of uterine fibroids: a randomized comparison. Cardiovasc Intervent Radiol, 2007. 30(5): p. 866-75.	Outcome not of interest
Holub, 2007	Holub, Z., M. Mara, and J. Eim, Laparoscopic uterine artery occlusion versus uterine fibroid embolization. International Journal of Gynecology and Obstetrics, 2007. 96(1): p. 44-45.	Intervention not of interest
Wu, 2007	Wu, O., et al., Uterine artery embolisation or hysterectomy for the treatment of symptomatic uterine fibroids: a cost-utility analysis of the HOPEFUL study. Bjog, 2007. 114(11): p. 1352-62.	Economic
Goodwin, 2006	Goodwin, S.C., et al., Uterine artery embolization versus myomectomy: a multicenter comparative study. Fertil Steril, 2006. 85(1): p. 14-21.	Included in Peng 2024
Mara, 2006	Mara, M., et al., Uterine fibroid embolization versus myomectomy in women wishing to preserve fertility: preliminary results of a randomized controlled trial. Eur J Obstet Gynecol Reprod Biol, 2006. 126(2): p. 226-33.	Included in Xu 2021
Siskin. 2006	Siskin, G.P., et al., A prospective multicenter comparative study between myomectomy and uterine artery embolization with polyvinyl alcohol microspheres: Long-term clinical outcomes in patients with symptomatic uterine fibroids. Journal of Vascular and Interventional Radiology, 2006. 17(8): p. 1287-1295.	Long-term follow-up of Goodwin, 2006 which is included in Peng 2024
Volkers, 2006	Volkers, N.A., et al., Uterine artery embolization in the treatment of symptomatic uterine fibroid tumors (EMMY trial): Periprocedural results and complications. Journal of Vascular and Interventional Radiology, 2006. 17(3): p. 471-480.	Relevant outcomes already captured from other EMMY publications
Beinfeld, 2004	Beinfeld, M.T., et al., Cost-effectiveness of uterine artery embolization and hysterectomy for uterine fibroids. Radiology, 2004. 230(1): p. 207-13.	Economic
Goldberg, 2004	Goldberg, J., et al., Pregnancy outcomes after treatment for fibromyomata: Uterine artery embolization versus laparoscopic myomectomy. American Journal of Obstetrics and Gynecology, 2004. 191(1): p. 18-21.	Wrong study type (pooled multiple separate case series, not comparative studies)

Study ID	Full Citation	Reasons for Exclusion
Pourrat, 2003	Pourrat, X.J., et al., Medico-economic approach to the management of uterine myomas: a 6-month cost-effectiveness study of pelvic embolization versus vaginal hysterectomy. Eur J Obstet Gynecol Reprod Biol, 2003. 111(1): p. 59-64.	Economic
Razavi, 2003	Razavi, M.K., et al., Abdominal myomectomy versus uterine fibroid embolization in the treatment of symptomatic uterine leiomyomas. AJR Am J Roentgenol, 2003. 180(6): p. 1571-5.	Included in Peng 2024
Al-Fozan, 2002	Al-Fozan, H., et al., Cost analysis of myomectomy, hysterectomy, and uterine artery embolization. Am J Obstet Gynecol, 2002. 187(5): p. 1401-4.	Economic
Baker, 2002	Baker, C.M., et al., Estimated costs for uterine artery embolization and abdominal myomectomy for uterine leiomyomata: A comparative study at a single institution. Journal of Vascular and Interventional Radiology, 2002. 13(12): p. 1207-1210.	Economic
Beinfeld, 2002	Beinfeld, M.T., J.L. Bosch, and G.S. Gazelle, Hospital costs of uterine artery embolization and hysterectomy for uterine fibroid tumors. Academic Radiology, 2002. 9(11): p. 1300-1304.	Economic
Broder, 2002	Broder, M.S., et al., Comparison of long-term outcomes of myomectomy and uterine artery embolization. Obstet Gynecol, 2002. 100(5 Pt 1): p. 864-8.	Included in Peng 2024
McLucas, 2001	McLucas, B. and L. Adler, Uterine fibroid embolization compared with myomectomy. International Journal of Gynecology and Obstetrics, 2001. 74(3): p. 297-299.	No outcomes of interest
Key Question 3		
Mitro, 2024	Mitro, S.D., et al., Long-Term Risk of Reintervention After Surgical Leiomyoma Treatment in an Integrated Health Care System. Obstet Gynecol, 2024. 143(5): p. 619-626.	Duplicate
Akhatova, 2023	Akhatova, A., et al., Reproductive and Obstetric Outcomes after UAE, HIFU, and TFA of Uterine Fibroids: Systematic Review and Meta-Analysis. Int J Environ Res Public Health, 2023. 20(5).	Wrong study type (all single arm)
Gupta, 2023	Gupta, A., et al., Changes in Pelvic Floor Symptoms After Procedural Interventions for Uterine Leiomyomas: A Systematic Review. Obstet Gynecol, 2023. 142(2): p. 319-329.	Urinary symptoms, pre vs. post, but not by procedure plus single arm
Li, 2023	Li, F., et al., HIFU as an alternative modality for patients with uterine fibroids who require fertility-sparing treatment. International Journal of Hyperthermia, 2023. 40(1).	Wrong study type (all single arms)
Mitro, 2023	Mitro, S.D., et al., LONG-TERM RISK OF REINTERVENTION AFTER UTERINE PRESERVING SURGICAL FIBROID TREATMENTS AND VARIATION BY SOCIODEMOGRAPHIC FACTORS. Fertility and Sterility, 2023. 120(4): p. e89.	Conference proceeding
Morris, 2023	Morris, J.M., et al., A Systematic Review of Minimally Invasive Approaches to Uterine Fibroid Treatment for Improving Quality of Life and Fibroid-Associated Symptoms. Reprod Sci, 2023. 30(5): p. 1495-1505.	Includes noncomparative studies
Zaritsky, 2023	Zaritsky, E., et al., Long-Term Risk of Reintervention after Uterine Preserving Surgical Fibroid Treatments and Variation by Sociodemographic Factors. Journal of Minimally Invasive Gynecology, 2023. 30(11): p. S5-S6.	Conference proceeding
Jonsdottir, 2022	Jonsdottir, G., et al., Ultrasound guided microwave ablation compared to uterine artery embolization treatment for uterine fibroids - a randomized controlled trial. Int J Hyperthermia, 2022. 39(1): p. 341-347.	Intervention not of interest

Study ID	Full Citation	Reasons for Exclusion
Laughlin-Tommaso, 2022	Laughlin-Tommaso, S.K., et al., Uterine and Fibroid Imaging Analysis from the FIRSTT Study. Journal of Women's Health, 2022. 31(4): p. 546-554.	Sub analysis of Laughlin-Tommaso, 2019 which is included in Liu 2021
Yerezhepbayeva, 2022	Yerezhepbayeva, M., et al., Comparison of two invasive non-surgical treatment options for uterine myomas: uterine artery embolization and magnetic resonance guided high intensity focused ultrasound—systematic review. BMC Women's Health, 2022. 22(1).	Wrong study type (all single arms)
Zhang, 2022	Zhang, J., et al., A Systematic Review of Minimally Invasive Treatments for Uterine Fibroid-Related Bleeding. Reprod Sci, 2022. 29(10): p. 2786-2809.	No meta-analysis
Zheng, 2022	Zheng, S., et al., Role of magnetic resonance-high intensity focused ultrasound (MR-HIFU) in uterine fibroids management: an updated systematic review and meta-analysis. Wideochir Inne Tech Maloinwazyjne, 2022. 17(1): p. 83-94.	Wrong study type (all single arms)
Jeng, 2020	Jeng, C.J., C.Y. Long, and L.T. Chuang, Comparison of magnetic resonance-guided high-intensity focused ultrasound with uterine artery embolization for the treatment of uterine myoma: A systematic literature review and meta-analysis. Taiwanese Journal of Obstetrics and Gynecology, 2020. 59(5): p. 691-697.	Includes 4 studies (Barnard 2017, Ikink 2014, Froeling 2013a and Froeling 2013b) already included in Yan
Laughlin-Tommaso, 2019	Laughlin-Tommaso, S., et al., FIRSTT study: randomized controlled trial of uterine artery embolization vs. focused ultrasound surgery. Am J Obstet Gynecol, 2019. 220(2): p. 174.e1-174.e13.	Included in Liu 2021
Laughlin-Tommaso, 2019	Laughlin-Tommaso, S., et al., FIRSTT study: randomized controlled trial of uterine artery embolization vs. focused ultrasound surgery. Am J Obstet Gynecol, 2019. 220(2): p. 174.e1-174.e13.	Duplicate
Taheri, 2019	Taheri, M., et al., Nonresective treatments for uterine fibroids: a systematic review of uterine and fibroid volume reductions. International journal of hyperthermia : the official journal of European Society for Hyperthermic Oncology, North American Hyperthermia Group, 2019. 36(1): p. 295-301.	Wrong study type (mostly noncomparative)
Yu, 2019	Yu, S.C., et al., Oxytocin-Augmented and Non-Sedating High-Intensity-Focused Ultrasound (HIFU) for Uterine Fibroids Showed Promising Outcome As Compared To HIFU Alone or Uterine Artery Embolization. Ultrasound Med Biol, 2019. 45(12): p. 3207-3213.	Included in Yan 2022
Davis, 2018	Davis, M.R., et al., Reintervention Rates after Myomectomy, Endometrial Ablation, and Uterine Artery Embolization for Patients with Uterine Fibroids. Journal of Women's Health, 2018. 27(10): p. 1204-1214.	Included in Xu 2021
Davis, 2018	Davis, M.R., et al., Reintervention Rates after Myomectomy, Endometrial Ablation, and Uterine Artery Embolization for Patients with Uterine Fibroids. Journal of Women's Health, 2018. 27(10): p. 1204-1214.	Duplicate
Sandberg, 2018	Sandberg, E.M., et al., Reintervention risk and quality of life outcomes after uterine-sparing interventions for fibroids: a systematic review and meta-analysis. Fertil Steril, 2018. 109(4): p. 698-707.e1.	More recent SRs available for both reintervention (Liu 2021) and QoL (Xu 2021) outcomes
Sandberg, 2018	Sandberg, E.M., et al., Reintervention risk and quality of life outcomes after uterine-sparing interventions for fibroids: a systematic review and meta-analysis. Fertility and Sterility, 2018. 109(4): p. 698-707.e1.	Duplicate

Study ID	Full Citation	Reasons for Exclusion
Barnard, 2017	Barnard, E.P., et al., Periprocedural outcomes comparing fibroid embolization and focused ultrasound: a randomized controlled trial and comprehensive cohort analysis. Am J Obstet Gynecol, 2017. 216(5): p. 500.e1-500.e11.	Included in Liu 2021 and Yan 2022
Borah, 2017	Borah, B.J., et al., Comparative Effectiveness of Uterine Leiomyoma Procedures Using a Large Insurance Claims Database. Obstet Gynecol, 2017. 130(5): p. 1047-1056.	Duplicate
Havryliuk, 2017	Havryliuk, Y., et al., Symptomatic Fibroid Management: Systematic Review of the Literature. Jsls, 2017. 21(3).	More recent SRs available
Babashov, 2015	Babashov, V., et al., Magnetic Resonance-Guided High-Intensity Focused Ultrasound (MRgHIFU) for Treatment of Symptomatic Uterine Fibroids: An Economic Analysis. Ont Health Technol Assess Ser, 2015. 15(5): p. 1-61.	Economic
Borah, 2014	Borah, B.J., et al., Cost comparison between uterine-sparing fibroid treatments one year following treatment. J Ther Ultrasound, 2014. 2: p. 7.	Economic
Borah, 2014	Borah, B.J., et al., Cost comparison between uterine-sparing fibroid treatments one year following treatment. J Ther Ultrasound, 2014. 2: p. 7.	Economic/Duplicate
Cain-Nielsen, 2014	Cain-Nielsen, A.H., et al., Cost-effectiveness of uterine-preserving procedures for the treatment of uterine fibroid symptoms in the USA. J Comp Eff Res, 2014. 3(5): p. 503-14.	Economic
Ikink, 2014	Ikink, M.E., et al., Volumetric MR-guided high-intensity focused ultrasound versus uterine artery embolisation for treatment of symptomatic uterine fibroids: comparison of symptom improvement and reintervention rates. Eur Radiol, 2014. 24(10): p. 2649-57.	Included in Liu 2021 and Yan 2022
Kong, 2014	Kong, C.Y., et al., MRI-guided focused ultrasound surgery for uterine fibroid treatment: a cost-effectiveness analysis. AJR Am J Roentgenol, 2014. 203(2): p. 361-71.	Economic
Froeling, 2013a	Froeling, V., et al., Midterm results after uterine artery embolization versus MR-guided high-intensity focused ultrasound treatment for symptomatic uterine fibroids. CardioVascular and Interventional Radiology, 2013. 36(6): p. 1508-1513.	Included in Liu 2021 and Yan 2022
Froeling, 2013b	Froeling, V., et al., Outcome of uterine artery embolization versus MR-guided high-intensity focused ultrasound treatment for uterine fibroids: Long-term results. European Journal of Radiology, 2013. 82(12): p. 2265-2269.	Included in Liu 2021 and Yan 2022
Fennessy, 2011	Fennessy, F.M., et al., Quality-of-life assessment of fibroid treatment options and outcomes. Radiology, 2011. 259(3): p. 785-792.	Duplicate
O'Sullivan, 2009	O'Sullivan, A.K., et al., Cost-effectiveness of magnetic resonance guided focused ultrasound for the treatment of uterine fibroids. Int J Technol Assess Health Care, 2009. 25(1): p. 14-25.	Economic
Zowall, 2008	Zowall, H., et al., Cost-effectiveness of magnetic resonance-guided focused ultrasound surgery for treatment of uterine fibroids. Bjog, 2008. 115(5): p. 653-62.	Economic

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Appendix D. Risk of Bias Assessment for the Included Sytematic Reviews, Randomized Controlled Trials, and Non-randomized studies

TABLE D-1. METHODOLOGICAL QUALITY OF INCLUDED SYSTEMATIC REVIEWS ACCORDING TO AMSTAR II

Study ID	AMSTAR II Domain Number																Overall Quality
	1	2*	3	4*	5	6	7*	8	9*	10	11*	12	13*	14	15*	16	
Peng, 2024	Y	N	N	N	Y	Y	N	N	Y	N	Y	N	N	N	N	Y	Critically low
Yan, 2022	Y	N	N	PY	Y	Y	N	N	Y	N	Y	Y	Y	N	Y	Y	Critically low
Liu, 2021	Y	Y	N	PY	Y	Y	N	N	Y	N	Y	N	N	N	Y	Y	Critically low
Xu, 2021	Y	N	N	Y	Y	Y	N	N	Y	N	Y	N	N	N	Y	Y	Critically low

TABLE D-2. METHODOLOGICAL QUALITY OF INCLUDED RANDOMIZED CONTROLLED TRIALS ACCORDING TO THE REVISED COCHRANE RISK-OF-BIAS TOOL FOR RANDOMIZED TRIALS (ROB 2)

Study, Year	Randomization process	Deviations from intended interventions	Missing outcome data	Measurement of the outcome	Selection of the reported result	Overall Bias
Jun, 2012	Some concerns	Low	Low	High	Some concerns	High
Ruuskanen, 2010	Some concerns	High	Low	Some concerns	Some concerns	High
Edward, 2007	High	Some concerns	Some concerns/High*	Some concerns	Low	High
Hehenkamp, 2005	Low	High	Some concerns/High*	Low	Some concerns	High
Pinto 2003	Low	High	Low	High	Some concerns	High

*Outcomes reported in the original RCT were rated "Some concerns," and outcomes reported in the long-term follow-up of the RCT were rated "High" risk of bias due to the concern about missing data. However, the overall risk of bias ratings for both were High.

TABLE D-3. METHODOLOGICAL QUALITY OF INCLUDED NON- RANDOMIZED CONTROLLED TRIALS ACCORDING TO RISK OF BIAS IN NON-RANDOMISED STUDIES - OF INTERVENTIONS (ROBINS-I)

Study, Year	Bias due to confounding	Bias in selection of participants into the study	Bias in classification of interventions	Bias due to deviations from intended interventions	Bias due to missing data	Bias in measurement of outcomes	Bias in selection of the reported result	Overall Bias
Mitro, 2024	Low	Low	Low	Low	Serious	Moderate	Low	Serious
Akturk, 2023	Critical	Low	Low	Low	Critical	Moderate	Low	Critical
Lavian, 2020	Low	Low	Low	Low	Moderate	Low	Low	Moderate
Mendelsohn, 2018	Low	Critical	Low	Low	Serious	Moderate	Low	Critical
Czuczwar, 2018	Critical	Serious	Low	Low	Serious	Low	Low	Critical
Keshavarzi, 2015	Critical	Low	Low	Low	Low	Serious	Low	Critical
Pruna, 2015	Critical	Moderate	Low	Low	Moderate	Moderate	Low	Critical
Arthur, 2014	Critical	Critical	Low	Low	Serious	Low	Low	Critical
Fennessy, 2011	Critical	Critical	Low	Low	Low	Serious	Low	Critical
Spies, 2010	Critical	Low	Low	Moderate	Moderate	Moderate	Low	Critical
Dutton, 2007	Moderate	Critical	Low	Low	Low	Low	Low	Critical
Gaetje, 2007	Critical	Critical	Low	Low	Critical	Serious	Low	Critical
Ohgi, 2007	Critical	Low	Low	Low	Serious	Serious	Low	Critical
Hovsepian, 2006	Critical	Low	Low	Low	Critical	Low	Low	Critical
Healey, 2004	Critical	Low	Low	Low	Serious	Low	Low	Critical
Spies, 2004	Critical	Low	Low	Low	Serious	Moderate	Low	Critical
Park, 2003	Critical	NI	Low	Low	Moderate	Serious	Low	Critical

931 Appendix E: Evidence Summaries

932 **SUMMARY OF THE INCLUDED SYSTEMATIC REVIEWS (DATA ARE PRESENTED AS UFE VS. MYO UNLESS OTHERWISE SPECIFIED)**

Study Details	Search Strategy/Evidence Base	Patients/Interventions	Outcomes/Results
Reference: Peng 2024[4] **Country**: China **Purpose**: To systematically review and meta-analyze all relevant studies to compare the outcomes of UFE and MYO treatments for the management of uterine fibroids. **Funding Source**: Special fund for research expense of Zhejiang University (Code: 226-2022-00093 and School code: K20220023) **Protocol Registration**: NR	PubMed, Embase, Medline, and the Cochrane Library for English-language studies were searched from inception to November 2023. The evidence base consisted of 4 RCTs (8 publications), 2 prospective post-RCT follow-up studies, and 7 retrospective post-RCT follow-up studies (8 publications). **Inclusion/Exclusion Criteria**: The criteria for inclusion in the review were defined in terms of participants, interventions, comparators, outcomes, and study designs as follows: premenopausal women aged 18 or above who are experiencing symptoms of uterine fibroids and require treatment. Interventions were UFE or myomectomy. The comparison was UFE vs. myomectomy. Primary outcomes assessed were the health-related quality-of-life, symptom severity score and reintervention. Secondary outcomes included the number of pregnancies, menstrual bleeding. Early postoperative major adverse events were monitored during the first 30 days after surgery. Studies that included other populations had to report data from the eligible population separately. Included study designs were RCTs or post-RCT follow-up studies, with a sample size of at least 10 patients in each group.	**Number of Patients**: 11,887 UFE and 24,469 myomectomy patients **Age, mean years**: (8 studies) 43.3 UFE vs. 39.5 myomectomy **Race**: (4 studies) White: 40.9% (2,698/6,587) UFE vs. 32.9% (3,320/10,087) MYO Black: 24.3% (1,601/6,587) UFE vs. 35.4% (3,573/10,087) MYO Other: 34.8% (2,288/6,587) UFE vs. 31.3% (3,194/10,087) MYO BMI: NR **Obstetric history** **Gravidity**: (3 studies) 86.9% (298/343) UFE vs. 78.8% (526/676) myomectomy **Menopausal status**: all premenopausal **Previous Myomectomy**: NR **Baseline Subfertility**: (3 studies) 13.1% (650/4,954) UFE vs. 15.1% (2,158/14,373) MYO **Fibroid Characteristics** Diagnosis methods: NR Number of fibroids: (2 studies) 1–3: 56.2% (155/276) UFE vs. 58.3% (109/187) MYO 4–10: 25.3% (70/276) UFE vs. 31.5% (59/187) MYO	**Symptom Improvement** SSS, mean difference (95% CI) at 2 years: (1 RCT, 1 post-RCT follow-up study, n=891; 276 UFE, 615 MYO) 2.13 (0.41, 3.85), favors MYO Heterogeneity: Chi^2=0.01, df=1 (p=0.92); I^2=0% SSS, mean difference (95% CI) at 4 years: (1 RCT, 1 post-RCT follow-up study, n=835; 246 UFE, 589 MYO) 4.02 (0.82, 7.22), favors MYO Heterogeneity: Chi^2=0.01, df=1 (p=0.91); I^2=0% Amenorrhea (2 RCTs, n=174; 91 UFE, 83 MYO) OR (95% CI): 0.80 (0.35, 1.84); p=0.60, no difference Light menstruation (2 RCTs, n=174; 91 UFE, 83 MYO) OR (95% CI): 1.83 (0.58, 5.80); p=0.31, no difference Normal menstruation (2 RCTs, n=174; 91 UFE, 83 MYO) OR (95% CI): 0.50 (0.05, 4.72); p=0.55, no difference Heavy menstruation (2 RCTs, n=174; 91 UFE, 83 MYO) OR (95% CI): 0.96 (0.38, 2.42); p=0.93, no difference **Complications** Major complications within 30 days after discharge, OR (95% CI): (2 RCTS; n=375, 185 UFE, 190 MYO) 0.44 (0.20, 0.95); p=0.04; favors UFE Heterogeneity: I^2=42%

Study Details	Search Strategy/Evidence Base	Patients/Interventions	Outcomes/Results
		>10: 29.3% (81/276) UFE vs. 12.1% (19/187) MYO Largest fibroid's location: (2 studies) Submucosa: 9.4% (26/276) UFE vs. 11.2% (21/187) MYO Subserosa: 29.3% (81/276) UFE vs. 27.3% (51/187) MYO Muscle wall: 21.7% (60/276) UFE vs. 32.1% (60/187) MYO Fibroid infarction rate: NR Largest fibroid volume: NR Uterine volume, cm^3: (4 studies) 796.6 UFE vs. 731.7 MYO **Intervention/Comparators**: UFE vs. MYO **Primary Outcomes**: HRQOL score (range 0-100; higher score indicates better quality of life), symptom severity score (range 0-100; higher score indicates increased severity), reintervention **Follow-up**: ranged from 6 months to 7 years	Readmission due to complication after discharge, OR (95% CI): (2 RCTs, 1 post-RCT follow-up study; n=16,042, 6,409 UFE, 9,633 MYO) 1.16 (1.01, 1.33); p = 0.04; favors MYO Heterogeneity: I^2=0% **Pregnancy Outcomes** Gravidity, OR (95% CI): (2 RCTs; n=375, 185 UFE, 190 MYO) 0.89 (0.18, 4.49); p= 0.88 Heterogeneity: I^2=55% Live births, OR (95% CI): (2 RCTs; n=375, 185 UFE, 190 MYO) 0.62 (0.12, 3.07); p= 0.56; favors MYO Heterogeneity: I^2=75% Miscarriage, OR (95% CI): (2 RCTs; n=375, 185 UFE, 190 MYO) 2.43 (0.90, 6.54); p= 0.08; favors MYO Heterogeneity: I^2=13% Termination/Induced Labor, OR (95% CI): (2 RCTs; n=375, 185 UFE, 190 MYO) 1.04 (0.15, 7.49); p=0.97 Heterogeneity: I^2=0% **Reintervention** Any reintervention, OR (95% CI) within 1 year: (1 RCT, 2 retrospective post-RCT follow-up studies, n=18,615; 4,731 UFE, 13,884 MYO) 1.77 (1.54, 2.04), favors MYO Heterogeneity: Tau^2=0.00; Chi^2=1.81, df=2 (p=0.41); I^2=0% Any reintervention, OR (95% CI) within 2 years:

Study Details	Search Strategy/Evidence Base	Patients/Interventions	Outcomes/Results
			(2 RCTs, 1 retrospective post-RCT follow-up study, n= 16,042; 6,409 UFE, 9,633 MYO) 3.44 (1.52, 7.77), favors MYO Heterogeneity: Tau^2=0.34; Chi^2=6.12, df=2 (p=0.05); I^2=67% <u>Any reintervention, OR (95% CI) within 4 years:</u> (2 RCTs, 2 retrospective post-RCT follow-up studies, n= 16,001; 6,401 UFE, 9,600 MYO) 2.00 (1.24, 3.23), favors MYO Heterogeneity: Tau^2=0.08; Chi^2=3.28, df=2 (p=0.19); I^2=39% <u>Hysterectomy, OR (95% CI) within 1 year:</u> (1 RCT, 2 retrospective post-RCT follow-up studies, n=18,615; 4,731 UFE, 13,884 MYO) 2.07 (0.80, 5.34), favors MYO Heterogeneity: Tau^2=0.33; Chi^2=3.18, df=2 (p=0.20); I^2=37% <u>Hysterectomy, OR (95% CI) within 2 years:</u> (2 RCTs, 1 retrospective post-RCT follow-up study , n= 16,042; 6,409 UFE, 9,633 MYO) 3.85 (2.53, 5.85), favors MYO Heterogeneity: Tau^2=0.04; Chi^2=1.20, df=1 (p=0.27); I^2=16% <u>Hysterectomy, OR (95% CI) within 4 years:</u> (1 RCT, 2 retrospective post-RCT follow-up studies, n= 16,002; 6,402 UFE, 9,600 MYO) 2.91 (1.30, 6.51), favors MYO Heterogeneity: Tau^2=0.29; Chi^2=4.88, df=2 (p=0.09); I^2=59% **Quality of life** <u>HRQOL, mean difference (95% CI) at 2 years:</u> (1 RCT, 1 prospective post-RCT follow-up study, n=891; 276 UFE, 615 MYO) -0.56 (-7.33, 6.22), favors UFE Heterogeneity: Tau^2=19.11; Chi^2=4.55, df=1 (p=0.03); I^2=78% <u>HRQOL, mean difference (95% CI) at 4 years:</u>

Study Details	Search Strategy/Evidence Base	Patients/Interventions	Outcomes/Results
			(1 RCT, 1 prospective post-RCT follow-up study, n=939; 303 UFE, 636 MYO) -2.42 (-5.31, 0.48), favors UFE Heterogeneity: Tau^2=0.00; Chi^2=0.33, df=1 (p=0.56); I^2=0%
Reference: Xu 2021[2] **Country**: China **Purpose**: to 1) compare the re-intervention rate between myomectomy, UFE and MRgFUS groups and 2) estimate a clinically meaningful re-intervention rate for UFs in different follow-up time. Funding Source: Bureau of Science and Technology Nanchong City Program [No: 16YFZJ0029; 18SXHZ0126]; the Primary Health Development Research Center of Sichuan Province Program [No: SWFZ17-Y-25; SWFZ17-C-69]; the Science and Technology Department of Sichuan province Program [No: 2015JY0056]; the Nanchong Federation of Social Science Associations Program [No: NC2016B017]; Yuzhong District Research Program of Basic Research and Frontier Technology of Chongqing [No. 20202723]. Protocol Registration: NR	PubMed, Embase and Cochrane databases were systematically searched for English language studies of human subjects from January 1, 2000 to December 31, 2020. The evidence base included 6 RCTs and 25 observational cohort studies. Inclusion/Exclusion Criteria: Population: The study participants were human beings. Interventions/comparators: initial myomectomy, UFE or MRgFUS. Outcomes: Studies provide sufficient data on uterine-sparing treatment, and re-intervention. The re-intervention was defined as all additional treatment necessary during the follow-up period to control persistent or recurrent fibroid-related symptoms (such as hysterectomy, myomectomy and endometrial ablation). Timing: A follow-up period of 12, 24, 36 and (or) 60 months were required after treatment. Study design: Original research papers with 30 or more patients. Studies with randomized controlled trials (RCTs), prospective or retrospective design. The studies were excluded according to the following criteria: (1) Abstracts, case reports, case series, meeting summaries, comments, letters, reviews or studies not related to human subjects. (2) Repeated studies including the same patients. (3) Insufficient sample size of less than 30	**Number of Patients:** 12 months: 19,678 (5,013 UFE, 14665 MYO) 24 months: 583 (98 UFE, 485 MYO) 36 months: 1,707 (1,523 UFE, 184 MYO) 60 months: 20,135 (6,051 UFE, 14,084 MYO) **Age, mean years:** NR **Race:** NR **BMI:** NR **Obstetric history:** NR **Menopausal status**: NR **Previous Myomectomy**: NR Baseline Reproductive Hormones: NR Fibroid Characteristics: NR **Intervention/Comparators:** UFE vs. MYO **Primary Outcomes**: Reintervention **Follow-up**: ranged from 1 to 10 years	**Reintervention** Re-intervention rate ([95% CI]; I^2) at 12 months: (6 studies UFE, 3 studies MYO; n=19,678, 5,013 UFE 14,665 MYO) 0.07 ([0.06, 0.09]; 14.2%) vs. 0.06 ([0.01, 0.11]; 95.1%) Re-intervention rate ([95% CI]; I^2) at 24 months: (3 studies UFE, 5 studies MYO; n=583, 98 UFE, 485 MYO) 0.08 ([0.01, 0.17]; 75.7%) vs. 0.10 ([0.04, 0.16]; 76.0%) Re-intervention rate ([95% CI]; I^2) at 36 months: (4 studies UFE, 3 studies MYO; n=1,707, 1,523 UFE, 184 MYO) 0.14 ([0.05, 0.23]; 94.7%) vs. 0.09 ([0.05, 0.13]; 0.0%) Re-intervention rate ([95% CI]; I^2) at 60 months: (11 studies UFE, 5 studies MYO; n=20,135; 6,051 UFE, 14,084 MYO) 0.21 ([0.17, 0.25]; 84.1%) vs. 0.19 ([0.15, 0.24]; 53.7%)

Study Details	Search Strategy/Evidence Base	Patients/Interventions	Outcomes/Results
	patients. (4) Studies with a lack of relevant outcome data.		

BMI: body mass index; CI: confidence interval; HRQOL: health-related quality of life; MRgFUS: magnetic resonance-guided focused ultrasound; MYO: myomectomy; No.: number; NR: not reported; RCT: randomized controlled trial; SSS: symptom severity score; UFE: uterine artery embolization

TABLE 1. SUMMARY OF THE INCLUDED OBSERVATIONAL STUDIES (DATA ARE PRESENTED AS UFE VS. MYO UNLESS OTHERWISE SPECIFIED)

Study Details	Population	Intervention/Comparator	Results
Reference: Mitro, 2024[16] **Country:** United States **Study design:** Retrospective cohort **Purpose:** To compare long-term risk of reintervention across four uterus-preserving surgical treatments for leiomyomas and to assess effect modification by sociodemographic factors **Funding sources:** National Institute of Arthritis and Musculoskeletal and Skin Diseases of the NIH under award K12AR084219 **Trial registration:** NR	*UFE vs. MYO vs. Hysteroscopic MYO* **Number of Patients**: 1,669 vs. 4,587 vs. 1,857 **Age Years Range (%):** p<0.001 for *UFE vs. MYO vs. Hysteroscopic MYO* 18-35**:** 61 (3.7%) vs. 1,516 (33.1%) 36-40: 206 (12.3%) vs. 1,544 (33.7%) 41-45: 645 (38.7%) vs. 1,026 (22.4%) 46–50: 757 (45.4%) vs. 501 (10.9%) **Race (%)**: p<0.001 for *UFE vs. MYO vs. Hysteroscopic MYO* Asian: 303 (18.4%) vs. 1,087 (24.1%) Black: 532 (32.2%) vs. 1,062 (23.5%) Hispanic: 306 (18.5%) vs. 847 (18.8%) White: 406 (24.6%) vs. 1,277 (28.3%) Additional races and ethnicities: 104 (6.3) vs. 244 (5.4%) Unknown or missing: 131 **Obstetric history:** Parity (%): p<0.001 for all 3 groups 0: 416 (26.8%) vs. 2,842 (65.4%) 1: 368 (23.7%) vs. 731 (16.8%) 2 or more: 766 (49.4%) vs. 774 (17.8%) Unknown or missing: 504	**UFE (n=1,669):** Details NR **MYO (n=4,587):** Details NR For all groups**:** Uterus-preserving procedures were MYO (abdominal, vaginal, or laparoscopic), uterine artery embolization, or hysteroscopic MYO, identified by ICD and Current Procedural Terminology codes. Reintervention was defined as a second uterus-preserving procedure or a hysterectomy more than 30 days after the index uterus-preserving procedure. Patient demographic and clinical factors (age, race and ethnicity, parity, BMI, and Neighborhood Deprivation Index [a composite variable reflecting Census tract–level socioeconomic status]) were obtained from the EHRs from the year before the index procedure. Patients self-identified race and ethnicity, which we categorized into groups (Asian, Black, Hispanic, White, and additional races and ethnicities [multiracial, Native American, Pacific Islander]); Race was included in this study because there are known racial disparities in leiomyoma burden that may translate to differences in reintervention risks. Symptoms (excessive or irregular bleeding, dyspareunia, pelvic or lower	**Re-intervention** Re-intervention at 1 year (%): 129/1,612 (8.0%) vs. 194/4,512 (4.3%); aHR 1.82 (95% CI 1.39–2.37); adjusted for age at index procedure, race and ethnicity, parity, body mass index, Neighborhood Deprivation Index, and year of index procedure Re-intervention at 3 years (%): 263/1,494 (17.6%) vs. 410/4,141 (9.9%); aHR 1.81 (1.51–2.19); adjusted for age at index procedure, race and ethnicity, parity, body mass index, Neighborhood Deprivation Index, and year of index procedure Re-intervention at 5 years (%): 319/1,405 (22.7%) vs. 561/3,619 (15.5%); aHR 1.62 (1.37–1.91); adjusted for age at index procedure, race and ethnicity, parity, body mass index, Neighborhood Deprivation Index, and year of index procedure Re-intervention at 7 years (%): 347/1,335 (26.0%) vs. 660/3,204 (20.6%); aHR 1.52 (1.30–1.78); adjusted for age at index procedure, race and ethnicity, parity, body mass index, Neighborhood Deprivation Index, and year of index procedure Re-intervention at all follow up time: aHR 1.42 (1.22–1.66); adjusted for age at index procedure, race and ethnicity, parity, body mass index, Neighborhood Deprivation Index, and year of index procedure First reintervention type [n (column %)] Endometrial ablation: 11 (3.0%) vs. 27 (3.6%) vs. 38 (6.7%); p=NR. Hysteroscopic MYO: 13 (3.6%) vs. 102 (13.5%); p=NR. MYO: 26 (7.2%) vs. 199 (26.4%); p=NR. UFE: 30 (8.3%) vs. 47 (6.2%); p=NR. Hysterectomy: 282 (77.9%) vs. 375 (49.7%); p=NR.

Study Details	Population	Intervention/Comparator	Results
	Menopausal status: NR **Concomitant medications:** NR **Previous MYO:** n=0, all categorized as first uterus-preserving procedure **Fibroid Characteristics:** NR Diagnosis method: NR Location of fibroids :NR Dominant fibroid diameter: NR Uterine volume: NR **Inclusion Criteria**: Patients in this prospective cohort analysis had a uterus-preserving leiomyoma procedure between January 1, 2009, and December 31, 2021; had a diagnosis of uterine leiomyomas (ICD, Ninth Revision code 218.*; ICD, 10th Revision code D25.*); had no record of prior hysterectomy; were Kaiser Permanente Northern California members for at least 1 year before and 1 year after treatment; and were 18–50 years of age at the first (index) uterus-preserving procedure. **Exclusion Criteria:** Patients who were pregnant or within 6 weeks postpartum at the index procedure (3.2%) were excluded. Patients with more than one type of index procedure on the same day were excluded.	abdominal pain, dysmenorrhea, and urinary incontinence) were identified with ICD codes. Patients were followed up from the index uterus-preserving procedure until December 31, 2022; end of Kaiser Permanente Northern California membership; or reintervention. **Follow-up:** up to 7 years. Median (IQR) follow up time was 4.0 (1.8, 8.6) years and 4.1 (2.0, 7.6) years for UFE and MYO groups, respectively	
Reference: Akturk, 2023[17] **Country:** Turkey **Study design:** retrospective cohort **Purpose:** To compare the rates of recurrence and	**Number of Patients**: 63 vs. 76 **Mean Age Years**: NR vs. 39.21 **Race**: NR **Obstetric history:** Number of births (%): 1: 29/63 (46.0%) vs. 39/76 (51.3%); p=NR.	**UFE (n=63):** Details NR **MYO (n=76):** Laparoscopic MYO: n=35 (46.1%), laparoscopic MYO and endometrioma surgery: n=18 (23.7%), laparoscopic MYO and cystectomy: n=4 (5.3%), laparotomic MYO: n=12 (15.8%), robotic assisted MYO: n=7 (9.2%).	**Symptom Improvement** Recurrence of symptoms (timepoint not reported): 9/63 (14.3%) vs. 24/76 (31.6%); p=0.132, no difference. UFS-QOL symptom severity, mean (SD), median (min-max) at 1 year: 48.16 (10.55), 46.88 (28.13-75.00) vs. 48.89 (10.44), 53.13 (21.88-78.13); U=2178.00; p=0.35, no difference.

Study Details	Population	Intervention/Comparator	Results
impacts on life quality between uterine fibroid embolization and MYO in women diagnosed with uterine myomas. **Funding sources:** All authors have declared that no financial support was received from any organization for the submitted work. **Trial registration:** NR	2: 20/63 (31.7%) vs. 26/76 (34.2%); p=NR. 3: 12/63 (19.0%) vs. 10/76 (13.2%); p=NR. 4: 2/63 (3.2%) vs. 1/76 (1.3%); p=NR. C-section (%): 11/63 (17.5%) vs. 10/76 (13.2%); p=NR. **Menopausal status:** NR **Concomitant medications:** NR **Previous MYO:** NR **Fibroid Characteristics:** Diagnosis method: Ultrasound and MRI Location of fibroids: Posterior: n= 43/63 (68.3%) vs. n=42/76 (55.3%); p=NR. Anterior: n=20/63 (31.7%) vs. n=34/76 (44.7%); p=NR. Most frequent size of fibroids: 6 cm (n=20, 31.7%) vs. 2 cm (n=12, 15.8%); p=NR. Fibroid type: Type 3: n=40 (63.5%) vs. n=40 (52.6%); p=NR. Type 4: n=20 (31.7%) vs. n=30 (39.5%); p=NR. Type 5: n=3 (4.8%) vs. n=6 (7.9%); p=NR. Uterine volume: NR **Inclusion Criteria**: Between 20 and 40 years and symptomatic Type 3-5 uterine myomas per FIGO classification. **Exclusion Criteria**: FIGO classified Type 1-2 6-7-8 myomas, polyps, adenomyosis, neoplasia, coagulation abnormalities, abnormal Pap smear, and abnormal endometrial biopsy findings, and age less than 20 or greater than 50.	For both groups: This single-center retrospective study included 152 patients who sought services at the Gynecology and Interventional Radiology clinics. During the investigation, 13 patients' records could not be accessed. Patient data was from the hospital database, which included pre and postprocedure magnetic resonance imaging (MRI) reports, findings from transvaginal ultrasonography, and patient examination records. The UFS-QOL questionnaire was employed to evaluate the participants. This assessment was administered presurgery, one-year postsurgery, and again five years later. Initially, ultrasonography imaging is preferable-frequent urination following constipation. In cases of sexual pain or distress, MRI position verification is preferred. Patients were offered both options. **Follow-up:** 5 years	UFS-QOL symptom severity, mean (SD), median (min-max) at 5 years: 46.94 (10.11), 46.88 (28.13-75.00) vs. 45.25 (12.63), 50.00 (21.88-62.50); U=1214.00; p=0.803, no difference. **Quality of Life** UFS-QOL, QOL, mean (SD), median (min-max) at 1 year: 60.91 (8.30), 59.48 (45.69-77.59) vs. 64.05 (8.98), 64.22 (48.28-81.03); U=1945.50; p=0.058, no difference. UFS-QOL, QOL, mean (SD), median (min-max) at 5 years: 64.52 (6.97), 64.22 (50.86-79.31) vs. 65.88 (7.40), 65.52 (48.28-79.31); U=1092.00; p=0.276, no difference. UFS-QOL anxiety mean (SD), median (min-max) at 1 year: 62.54 (8.56), 65.00 (40.00-80.00) vs. 76.38 (13.38), 80.00 (45.00-100.00); U=948.50; p=NR. UFS-QOL anxiety mean (SD), median (min-max) at 5 years: 81.80 (9.99), 80.00 (60.00-100.00) vs. 77.00 (10.05), 80.00 (55.00-100.00), U=940.00; p=0.030, favors MYO. UFS-QOL activity mean (SD), median (min-max) at 1 year: 51.47 (12.87), 50.00 (21.43-82.14) vs. 46.57 (12.54), 46.43 (21.43-71.43); U=1896.50; p=0.035, no difference. UFS-QOL activity mean (SD), median (min-max) at 5 years: 50.07 (10.39), 46.43 (32.14-71.43) vs. 47.14 (10.77), 50.00 (21.43-71.43); U=1170.50; p=0.580, no difference. UFS-QOL energy/mood mean (SD), median (min-max) at 1 year: 73.53 (11.31), 75.00 (50.00-96.43) vs. 74.11 (13.55), 78.57 (39.29-96.43); U=2215.00; p=0.446, no difference. UFS-QOL energy/mood mean (SD), median (min-max) at 5 years: 70.57 (12.30), 69.64 (50.00-96.43) vs. 76.14 (12.19), 82.14 (42.86-89.29); U=914.50; p=0.020, no difference. UFS-QOL control mean (SD), median (min-max) at 1 year: 50.95 (24.24), 50.00 (.00-85.00) vs. 58.68 (19.21), 65.00 (5.00-85.00); U=1988.50; p=0.085, no difference. UFS-QOL control mean (SD), median (min-max) at 5 years: 57.60 (20.98), 65.00 (5.00-85.00) vs. 65.80 (16.46), 70.00 (15.00-85.00); U=968.50; p=0.051, no difference.

Study Details	Population	Intervention/Comparator	Results
			UFS-QOL consciousness mean (SD), median (min-max) at 1 year: 60.85 (26.67), 41.67 (25.00-100.00) vs. 65.90 (22.94), 62.50 (25.00-100.00); U=2052.50; p=0.137, no difference. UFS-QOL consciousness mean (SD), median (min-max) at 5 years: 61.83 (27.31), 41.67 (25.00-100.00) vs. 65.67 (22.69), 58.33 (25.00-100.00); U=1117.00; p=0.339, no difference. UFS-QOL sexual function mean (SD), median (min-max) at 1 year: 70.63 (19.33), 75.00 (25.00-100.00) vs. 69.90 (21.33), 75.00 (25.00-100.00); U=2341.50; p=0.819, no difference. UFS-QOL sexual function mean (SD), median (min-max) at 5 years: 72.00 (16.08), 75.00 (50.00-100.00) vs. 68.25 (22.05), 50.00 (25.00-100.00); U=1084.00; p=0.237, no difference.
Reference: Mendelsohn, 2018[19] **Country:** US **Study design:** Retrospective cohort **Purpose:** To compare durability of uterus-conserving procedures for symptomatic fibroids in terms of incidence and time to subsequent procedures. **Funding sources:** Patient-Centered Outcomes Research Institute Award (award no. CE-12-11-4430) **Trial registration:** NR	**Number of Patients**: 298 vs. 1,076 **Mean Age Years (SD):** 43.7 (5.0) vs. 39.9 (6.7) **Race, n (%)**: Black/African–American: 132 (20.3%) vs. 314 (48.4%) White/Caucasian: 79 (7.0%) vs. 375 (33.3%) Other: 11 (10.2%) vs. 54 (50.0%) Unknown: 76 (9.9%) vs. 333 (43.5%) **Obstetric history:** NR **Menopausal status:** NR **Concomitant medications:** NR **Previous MYO:** n=0, patients with a record of any procedures of interest occurring before 1 January 2005 were excluded **Fibroid Characteristics:** NR Diagnosis method: NR Location of fibroids: NR Dominant fibroid diameter: NR	**UFE (n=298):** Details NR **MYO (n=1,076):** Details NR For all groups**:** Q-EMR data were obtained from a national network of out-patient offices whose providers allow their de-identified patient-level data to be made available for research. Clinical data were captured from more than 525 member institutions and more than 30,000 providers. The Q-EMR data were then linked to the Truven MarketScan claims data using an algorithm based on specific data elements (gender, month/year of birth and three digit zip codes) and healthcare service dates. The study time period spanned from 1 January 2004 to 31 December 2013 to allow for 12 months preindex for evaluating baseline demographic and clinical characteristics and 24 months postindex, ensuring a minimum of 2 years follow-up. Patient demographics and relevant medical history were extracted from the linked Q-EMR and claims data. Potential	**Re-intervention** Patients with subsequent procedure* occurring within 2 years following the index procedure, n (%):33 (11.1%) vs. 141 (13.1%); p=NR. Re-intervention within 2 years, ***UFE vs. Ablation***, aOR: 0.59 (95% CI, 0.38-0.94) controlling for race, region, index procedure, symptoms, comorbidities and age. Re-intervention within 2 years, ***MYO vs. Ablation***, aOR: 0.68 (95% CI, 0.50-0.92) controlling for race, region, index procedure, symptoms, comorbidities and age. Patients with subsequent procedure* during a mean follow-up of 53.4 months, n (%): 57 (19.3%) vs. 266 (24.7%); p=NR. Re-intervention during a mean follow-up of 53.4 months, ***UFE vs. Ablation***, aHR: 0.61 (95% CI, 0.43, 0.86) controlling for race, region, index procedure, symptoms, comorbidities and age. Re-intervention during a mean follow-up of 53.4 months, ***MYO vs. Ablation***: aHR 0.74 (95% CI, 0.60, 0.92) controlling for race, region, index procedure, symptoms, comorbidities and age Days to subsequent procedure mean (SD): 753.2 (508.9) vs. 822.1 (671.2); p=NR. Days to subsequent procedure median (Q1, Q3): 619 (428, 985) vs. 624.5 (283, 1313); p=NR.

Study Details	Population	Intervention/Comparator	Results
	Uterine volume: NR **Inclusion Criteria**: Female patients with a diagnosis of uterine fibroids who had a record of at least one of the uterus-conserving procedures of interest occurring during the time period of 1 January 2005–31 December 2011, with the first instance being designated as the index date. Only patients aged 18–54 years at the index date were included in the analysis. **Exclusion Criteria**: Patients with a diagnosis of gynecologic cancer (ovarian, uterine, cervical); first recorded diagnosis of uterine fibroids occurring beyond 4 weeks after the index date (only for patients who underwent endometrial ablation or hysterectomy); and patients with a record of any procedures of interest occurring before 1 January 2005. A total of 2648 patients who met these criteria were identified.	predictors were evaluated, including patient demographics (age, race/ethnicity, geographic region), comorbid medical conditions, and symptoms (e.g., bleeding, pain) at the time of the index procedure. Comorbidities were classified into the following categories: none; any high risk comorbidity (including coronary artery disease, heart failure, myocardial infarction, stroke, cardiac dysrhythmias); any other nonhigh risk comorbidity (hypertension, Type 2 diabetes mellitus, disorders of lipid metabolism) and obesity (obesity alone and obesity with any other high-risk comorbidity). Symptoms were classified into three groups: bleeding (anemia, menorrhagia), pain (pelvic pain not related to menstrual cycle, dysmenorrhea), and other symptoms (urinary retention, leukorrhea, hydronephrosis, shortness of breath, dyspareunia, constipation, diarrhea, back pain, leg pain, dysuria). **Follow-up:** mean: 53.4 months, median: 48.5 months (range: 24 to 112 months)	
Reference: Keshavarzi, 2015[22] **Country:** Iran **Study design:** Prospective cohort **Purpose:** To compare AMH among MYO and UFE in the uterine fibroma therapy. **Funding sources:** NR **Trial registration:** NR	**Number of Patients**: 20 vs. 20 **Mean Age Years (SD):** 34.55 (3.94) vs. 35.50 (3.88); p=0.968, no difference. **Race**: NR **Obstetric history:** NR **Menopausal status:** NR **Concomitant medications:** NR **Previous MYO:** NR **Fibroid Characteristics:** NR Diagnosis method: NR	**UFE (n=20):** Details NR **MYO (n=20):** Details NR For both groups**:** Measures were undertaken to keep the names of patients confidentially and to avoid any cost on them. Also, in the origin of the research, the details of the interventions were defined with the gynecologist and resident to the patients. Then the patients voluntarily decided to receive UFE or MYO, while considering the required criteria for receiving the treatments. In	**Symptom Improvement** Pain score (high scores indicate greater pain severity) at 3 days post-intervention, mean (SD): 7.20 (1.70) vs. 6.35 (2.03); p=0.160, no difference. **Re-intervention** Re-intervention at 6 months: 0 vs. 0; no patient required re-intervention. **Ovarian Reserve** AMH level at 6 months, minimum/maximum, mean (SD): 0.1/20.8, 2.14 (2.14) vs. 0.1/21, 3.05 (4.62); p=0.58, no difference.

Study Details	Population	Intervention/Comparator	Results
	Location of fibroids: NR Dominant fibroid diameter: NR Uterine volume: NR **Inclusion Criteria**: NR **Exclusion Criteria:** NR	addition, the patients were categorized in four age groups including 20-25, 25-30, 30-35, and 35-40 years and were matched in the 2 group. Demographic and background information (age, hospitalization duration, pain severity after one week, re-intervention, the cost, and time elapsed for the sick for return to work) also clinical and laboratory findings were gathered by the resident and documented in a checklist. AMH measurement was done by the Monobinal kit and all laboratory tests were done at Razi Laboratory. AMH level was measured before the interventions. Pain severity was determined at third post intervention day. The hospitalization period is texted. The phone number of the resident was delivered to all patients to contact her in case of facing any problem after discharge from hospital. Six months later, the patients were contacted by the resident and were asked to present into the clinic for a free consultation and physical examination. At that visit, the AMH level also serum hemoglobin levels were measured. Also, the patients were asked about pain, additional treatments such as hormonal agents, re intervention, re-presentation to hospital, and time period required to return to work. **Follow-up:** 6 months	
Reference: Pruna, 2015[21] **Country:** Romania	**Number of Patients**: 45 vs. 45 **Range Age Years, Average:** 17 to 42, 28.4 vs. 22 to 45, 32.1; p=NR. **Race**: NR	**UFE (n=45):** Prior to the procedure painkiller/anti-inflammatory (e.g. ketoprofen, indomethacin) was administered, the patient was sedated (i.e. fentanyl and midazolam); and antibiotic	**Symptom Improvement** Symptom improvement (menorrhagia decrease considerably or even absent) post procedure (timepoint NR): 91.2% vs. 63.4%; p=NR.

Study Details	Population	Intervention/Comparator	Results
Study design: Retrospective descriptive study **Purpose:** To assess treatment response in women diagnosed with bulky uterine fibroids who underwent UFE or MYO **Funding sources:** NR **Trial registration:** NR	**Obstetric history:** NR **Menopausal status:** NR **Concomitant medications:** NR **Previous MYO:** NR **Fibroid Characteristics:** bulky uterine fibroids (definition not provided) Diagnosis method: NR Location of fibroids: NR Dominant fibroid diameter: NR Uterine volume: NR **Inclusion Criteria**: NR **Exclusion Criteria:** NR	prophylaxis was administered (usually a cephalosporin). The approach was currently brachial- a 5F introducer sheath is mounted at this level. Then a 3F/4F/5F catheter is inserted. It is indicated the use of a 3F micro catheter followed by the administration of nitroglycerin. Nitroglycerin has a vasodilation effect on small arteries and avoids an arterial spasm with the inaccurate migration of particles injected in the vessel that would lead to ovarian dysfunction or even ovarian failure. When the junction of the common iliac artery with the aorta is reached while advancing the catheter, the first insertion of contrast dye is made to visualize the pelvic vascularization; subsequently, the process of 'imaging roadmap' is being started. After passing through the aortic bifurcation using the "crossover" technique, the catheter is inserted into the left common iliac artery with its advancement in left internal iliac artery for the left uterine artery approach. Then the probe must be positioned as close as possible to the arterial branches that provide blood flow to the fibroid to inject the substance containing polyvinyl alcohol particles or gelatin sponge (Gellfoam) by x-ray guidance, until the artery is blocked. The amount of substance injected depends on the arterial caliber and on fibroid's volume. A partial embolization by selection of vessels that feed the fibroid without stopping all the blood flow through the uterine artery if there is just one nodule is recommended. Some operators mix the embolizing substance with 5 mg of 1%	Presence of postoperative intense pain during the first 5 days postop: 85.2% vs. 21.7%; p=NR. Chronic pain reduction post procedure (timepoint NR): 68.4% vs. 54.3%; p=NR. Bulk effect reduction (timepoint NR): 72.8% vs. 42.9%; p=NR Days of NSAIDs needed: 2.2 vs. 4.0; p=NR. **Patient Satisfaction** Satisfaction with procedure (timepoint NR): 91.2% vs. 79%; p=NR. **Re-intervention** Reintervention within 6 months: 53.3% vs.40%; p=NR Second procedure type, n (%) Hysterectomy: 10/45 (22.22%) vs. 12/45 (26.67%); p=NR. MYO: 12/45 (26.67%) vs. 6/45 (13.33%); p=NR. Embolization: 2/45 (4%) vs. 0/45; p=NR.

Study Details	Population	Intervention/Comparator	Results
		lidocaine to reduce pain after intervention. The procedure takes between one hour and one hour and a half. For confirming the success, after intervention an arteriogram is performed. **MYO (n=45):** Performed through a laparotomy followed by the uterine incision at the level of the leiomyoma. The uterine incision must be well planned to prevent complications, it can be transverse but usually a vertical incision is made directly over each myoma, in order not to intercept the arcuate arteries. After the visualization of the fibroid's capsule, the leiomyoma must be enucleated (there were described many techniques, either a blunt dissection of the nodule, or a vertical incision through the nodule separating it in two parts followed by the extraction of each, or a traction on the myometrial edges with Allis clamps). The uterine defects are then closed with sutures in layers. **Follow-up:** 6 months	
Reference: Arthur, 2014[23] **Country**: Canada **Study design:** Retrospective cohort **Purpose:** To compare the relative long-term effects on ovarian reserve of treating fibroids in reproductive-aged women with UFE versus MYO, using sensitive measures including AFC and AMH. **Funding sources:** NR	*UFE vs.* laparoscopic MYO **Number of Patients**: 8 vs. 5 **Mean Age Years (SD):** 40.9 (1.9) vs. 39.4 (4.2), p: NS. **Race**: Black: 2 vs. 2; p=NR. Caucasian: 2 vs. 2; p=NR. Other: 1 vs. 4; p=NR. **Obstetric history:** NR **Menopausal status:** Premenopausal **Concomitant medications:** NR	*UFE vs.* laparoscopic MYO **UFE (n=8):** Procedures were performed in a similar fashion by 1 of 3 experienced interventional radiologists at a single institution. Patients received antibiotic prophylaxis and medication for pain control during the procedure. A 4 French vascular sheath was inserted into the right common femoral artery using aseptic Seldinger technique19 and local anaesthesia and was advanced in retrograde fashion. A 4 French C2 Glidecath and a .035 angled Glidewire (Terumo Medical Corp., Somerset NJ) were used to select the left	*UFE vs.* laparoscopic MYO **Serious Adverse Events** Blood loss requiring a transfusion: 0/8 vs. 1/5; p=NR. Pain that did not react to standard pain control during the procedure and required additional medications: 1/8 vs. 0/5; p=NR. **Ovarian Reserve** AMH, ng/mL median (range) at >12 months: 0.78 (0.67 to 1.28) vs. 2.17 (1.17 to 2.38); p=0.01, favors LM. AFC, per ovary median (range) at >12 months: 3.5 (2 to 7) vs. 7 (6 to 11); p=0.03, favors LM. FSH, IU/L, median (range) at >12 months: 7.6 (5.8 to 9.35) vs. 5.4 (4.7 to 7.5), p: NS, no difference.

Study Details	Population	Intervention/Comparator	Results
Trial registration: NR	**Previous MYO:** 0 vs. 0 **Fibroid Characteristics:** Diagnosis method: NR Location of fibroids: NR Dominant fibroid diameter, cm, median (range): 6.7 (2.8 to 13.5) vs. 9.0 (6 to 10), p: NS. Number of fibroids, median (range): 2.5 (2 to 8) vs. 2.2 (1 to 7), p: NS. Uterine volume: NR **Inclusion Criteria**: Eligible women were between 20 and 43 years of age at the time of the study and had undergone either LM or UFE at one of the study institutions at least 12 months before the study date. Potential participants were contacted initially by mail and then by follow-up telephone call. **Exclusion Criteria:** Subjects were excluded if they had undergone any additional intervention to treat their fibroids, either before or after the UFE or LM procedure of interest. They were also excluded if they had ever had any ovarian surgery.	common and internal iliac arteries. The left uterine artery was embolized at its proximal ascending segment beyond the cervicovaginal branch to near-complete occlusion using Cook polyvinyl alcohol foam particles of 300 to 500 µm (Cook Medical Inc., Bloomington IN). A Waltman loop20 was then formed over the aortic bifurcation and removed after the right common and internal iliac arteries were selected. The right uterine artery was selected to its proximal ascending segment and embolized in the same fashion. Patients were admitted to hospital overnight following the procedure for pain control using a morphine patient-controlled analgesia pump. **Laparoscopic MYO (n=5):** All laparoscopic MYO procedures were performed by a single experienced surgeon at one institution. Fibroid mapping via transvaginal ultrasound and sonohysterogram was performed preoperatively to document fibroid size and location and to exclude any submucosal fibroids. Patients did not receive preoperative treatment with GnRH agonists. A vasopressin solution was injected into the serosa and myometrium overlying the fibroid to decrease bleeding. A horizontal incision was performed with sparing use of unipolar cautery through the serosa and myometrium to the level of the fibroid. Fibroids were enucleated along the cleavage plane with great care to avoid the endometrial cavity and to avoid manipulation of the cornua or fallopian tubes. The myometrial defect was closed	Estradiol, pmoL/L median (range) at >12 months: 182 (137 to 213) vs. 184 (91 to 198), p: NS, no difference.

Study Details	Population	Intervention/Comparator	Results
		with interrupted sutures in layers via laparoscopic suturing. The excised fibroids were removed with an electrical morcellator. The serosa was closed with a continuous baseball stitch, and a barrier agent of oxidized regenerated cellulose was placed on the uterine incisions. Patients were admitted to hospital for monitoring overnight and were discharged on the next day. For both groups: A chart review was performed to gather information about the outcomes of LM and UFE procedures. The UFE procedure was considered successful if it resulted in complete bilateral peripheral uterine artery occlusion at end of the procedure. The LM procedure was considered successful if all fibroids of 2 cm diameter or larger were removed completely. Complications were defined as severe pain not reacting to standard pain control, blood loss requiring transfusion, groin hematoma, injury to abdominal organs other than uterus, conversion to laparotomy, large vessel injury, reoperation for hemoperitoneum, prolonged hospitalization (> 1 night), readmission to hospital, and infection. **Follow-up:** >12 months	
Reference: Gaetje, 2007[27] **Country:** Germany **Study design:** Retrospective single-center cohort **Purpose:** To investigate the treatment results in patients with symptomatic uterine	**Number of Patients**: 80 vs. 60 **Mean Age Years (range):** UFE: 45 (32–55) vs. hysteroscopy MYO: 39 (32–53) vs. laparoscopy MYO: 39 (31–53) vs. laparotomy MYO: 37 (32–46); p=NR. **Race**: NR **Obstetric history:** NR	**UFE (n=80):** In the period from January 2001 to June 2005, 140 women underwent uterine artery embolization. The subjective success of the treatment was assessed retrospectively using a questionnaire. An analog scale from 1 to 10 was used for pain assessment. A total of 80 cases were evaluable from the group of patients who received uterine artery embolization.	**Symptom Improvement** Hypermenorrhea (at the time of survey; see follow-up time): 12/80 (77%) vs. 11/60 (68%); p=0.46, no difference. Metrorrhagia (at the time of survey; see follow-up time): 10/80 (77%) vs. 6/60 (78%); p=NS, no difference. Dysmenorrhea (at the time of survey; see follow-up time): 16/80 (56%) vs. 19/60 (39%); p=0.035, favors UFE.

Study Details	Population	Intervention/Comparator	Results
fibroids who underwent fibroid enucleation with hysteroscopy, laparoscopy, or laparotomy, or alternatively uterine artery embolization. **Funding sources:** NR **Trial registration:** NR	**Menopausal status:** NR **Concomitant medications:** NR **Previous MYO:** NR **Fibroid Characteristics:** Diagnosis method: NR Location of fibroids: NR Dominant fibroid diameter in mm: UFE: 63.7 (28.5) vs. hysteroscopy MYO: 26 (11.4) vs. laparoscopy MYO: 46 (21.6) vs. laparotomy MYO: 582 (17.5); p=NR. Uterine volume: NR **Inclusion Criteria**: Patients with symptomatic fibroids treated with uterus-preserving operations. The surgical population was treated with surgical hysteroscopy, laparoscopy, or laparotomy The embolization population was patients with the same disorder who underwent uterine artery embolization. **Exclusion Criteria**: Patients who received combined procedures (surgical hysteroscopy and abdominal fibroid enucleation) were excluded due to the small number of cases.	Uterine artery embolization was carried out when hysterectomy was declined and organ-preserving surgery was not possible or practicable, when there were contraindications for surgery, or at the patient's request. **MYO (n=60):** In the period from January 2001 to June 2005, 120 uterus-preserving operations were carried out to treat symptomatic fibroids in our department. The surgical population was treated with surgical hysteroscopy (group 1), laparoscopy (group 2), or laparotomy (group 3). A total of 60 cases were evaluable in the surgically treated groups (groups 1–3). Patients with several intramural fibroids were advised to undergo fibroid enucleation via a laparotomy, particularly when they wished to have children. Two patients (one each in groups 1 and 2) received an abdominal hysterectomy, and one patient in group 3 underwent a repeated fibroid enucleation. Both groups: Follow-up was conducted using standardized questionnaires mailed to each patient and was completed by 60/120 patients from the surgical population and 80/140 patients from the embolization population. **Follow-up:** Mean follow up was 40.1 months for UFE group, and 29.1, 26.2, and 27.2 months for hysteroscopy, laparoscopy, and laparotomy MYO groups, respectively.	Pain score (1-10 scale; measured only in 62 vs. 34 patients with preoperative pain; at the time of survey; see follow-up time) 1.5 (2.3) vs. 2.8 (2.6); p=NS, no difference. **Patient Satisfaction** Would undergo same procedure again at the time of survey; see follow-up time: >90% vs. 93%; p=NR. **Serious Adverse Events** Blood transfusion during postoperative period: 0/80 vs. 4/60; p=NR; all 4 patients had hemoglobin level ≤9g/dL at baseline. **Re-intervention, type** MYO: 2/80 vs. 1/60; p=NR. Hysterectomy: 1/80 vs. 2/60; p=NR.
Reference: Ohgi, 2007[26] **Country:** Japan	*UFE vs. laparoscopic or laparoscopy-assisted MYO* **Number of Patients**: 78 vs. 58	*UFE vs. laparoscopic or laparoscopy-assisted MYO*	*UFE vs. laparoscopic or laparoscopy-assisted MYO* **Symptom Improvement**

Study Details	Population	Intervention/Comparator	Results
Study design: Retrospective cohort **Purpose**: To evaluate convalescence and the incidence of adverse symptoms associated with UFE in the treatment of uterine fibroids, several parameters after UFE were compared with those after laparoscopic surgery. **Funding sources:** NR **Trial registration:** NR	**Mean Age Years (SE):** UFE: 43.3 (0.5) vs. LM: 36.0 (1.0) vs. LAM: 39.7 (1.0); UFE vs. LM: p<0.0001; UFE vs. LAM: p=0.0009. **Race**: NR **Obstetric history:** Nulliparous (%): UFE: 40.9% vs. LM: 74.2% vs. LAM: 63.0%; UFE vs. LM: p <0.05; UFE vs. LAM: p<0.05. **Menopausal status:** NR **Concomitant medications:** NR **Previous MYO:** Received laparotomy (%): UFE: 21.2% vs. LM: 10.8% vs. LAM: 17.1%; UFE vs. LM: p=NS; UFE vs. LAM: p=NS. **Fibroid Characteristics:** Diagnosis method: NR Location of fibroids: NR Size of fibroid diameter: 2 cm vs. 8 cm; p=NR. Uterine volume: NR **Inclusion Criteria**: From July 2001 to July 2004, 136 patients who suffered from symptomatic uterine fibroids were recruited for the study. **Exclusion Criteria:** Laparoscopic hysterectomy, abdominal MYO and abdominal hysterectomy were excluded.	**UFE (n=78):** UFE was performed with 300–500-μm-sized gelatin sponge particles (Gelforam, Pfizer Japan, Tokyo, Japan) as the embolic agent using a 4-french visceral catheter (CX catheter A-II, CATHEX, Kanagawa, Japan) under local anesthesia and IV sedation. An embolization endpoint was complete stasis in the uterine artery. Morphine hydrochloride (Morphine hydrochloride, Shionogi, Osaka, Japan) was used for controlling pain after the UFE. **Laparoscopic surgery (n=58; laparoscopic MYO [n=36]) and laparoscopy-assisted MYO [n=27])):** Laparoscopic surgeries were performed under the pneumoperitoneum under general anesthesia. LM was performed by a closed method with five punctures and all procedures were done in the interperitoneal space, but LAM was performed by a closed method with three punctures and 5 cm transverse incision at the lower abdominal segment because the removal of fibroids and sutures were done directly by hand. A 50-fold diluted vasopressin solution in saline (Pitoressin, Sankyo, Tokyo, Japan) was directly injected into the fibroids to reduce bleeding. Pentazocine (Sosegon, Yamanouchi, Tokyo, Japan) and NSAIDS (Voltaren, Novartis Pharma, Tokyo, Japan) were used for pain control after the procedures. For all groups: The treatment methods were not selected randomly but also depended on patients' decision, which	VAS (0-10) at 6 months mean (SE): UFE: 3.9 (0.3) vs. LM: 4.1 (0.7) vs. LAM: 3.2 (0.7); p=NS, no difference. VAS (0-10) at 12 months mean (SE): VAS scores in each group were similar to those 6 months after treatment. (Results reported graphically in Figure 2.) Necessity for painkiller over 7 days (%): 51.4% vs. 20.0%; p= 0.0003, favors laparoscopic MYO

Study Details	Population	Intervention/Comparator	Results
		was based on information given about both treatments. All patients were followed for a 12-month period after the procedures. Postoperative instructions to the patient were to resume normal activities as early as possible (e.g. taking a shower, cooking or sweeping). Several factors indicating the recovery states of the patients from the UFE treatment or laparoscopic surgery, such as a length of hospital stay, a period until the beginning of normal daily life (e.g. taking a shower), the period until the beginning of house or business work and the period until beginning to drive a car, ride a bicycle or to exercise, were retrospectively observed in each treatment using a questionnaire. The degree of improved symptom was evaluated using VAS at 6 and 12 months after each procedure. VAS score was quantified as the degree of improved symptom compared with before treatment. **Follow-up:** 12 months	
Reference: Hovsepian, 2006[29] **Country:** United States **Study design:** Prospective cohort **Purpose:** To prospectively compare UFE versus MYO and hysterectomy with regard to ovarian function as measured by post-procedure follicle-stimulating hormone (FSH) levels and symptoms.	**Number of Patients**: 33 vs. 7 **Mean Age Years (SD):** 41.8 (4.8) vs. 35.3 (5.3) **Race**: NR **Obstetric history:** NR **Menopausal status:** All premenopausal **Concomitant medications:** NR **Previous MYO:** NR **Fibroid Characteristics:** NR **Baseline FSH, mean IU/L (SD):** 5.8 (9.6) vs. 3.0 (1.6)	**UFE (n=33):** All UFE procedures were performed by one of two interventional radiologists in a standardized fashion. Briefly, a right common femoral artery approach was chosen, and the uterine arteries were selected with use of a coaxial microcatheter system through a 4-F catheter inserted first into the left uterine artery and then into the right. Embolic agents approved by the U.S. Food and Drug Administration were used; they included 500- to 700-μm and/or 700- to 900- μm Embosphere particles (Biosphere Medical, Rockland, MA) or 355- to 700-	**Ovarian reserves** FSH, mean at 1 month, IU/L (SD; n): 5.9 (6.7; n=31) vs. 2.4 (2.0; n=3) FSH, mean at 3 months, IU/L (SD): 13.6 (16.6; n=19) vs. 4.1 (1.3; n=4) Elevated FSH (>10 IU/L) at 3 months: 7/33 vs. 0/7. Three of them had FSH returned to normal range by 6 months, 1 remained increased, and 3 were lost to follow up. FSH, mean at 6 months, IU/L (SD): 7.5 (8.4; n=20) vs. 3.6 (1.0; n=3) Menopausal/vasomotor symptoms (hot flashes, vaginal dryness, difficulty sleeping, and urinary and/or gastrointestinal disturbance):

Study Details	Population	Intervention/Comparator	Results
Funding sources: NR (reported no conflicts of interest) **Trial registration:** NR	**Inclusion Criteria:** Women ages 18-50 with symptomatic uterine leiomyomas who were seeking treatment. **Exclusion Criteria:** treatment with a gonadotropin-releasing hormone within 3 months (which would influence FSH and potentially cause menopausal symptoms), unilateral or bilateral oophorectomy at the time of hysterectomy, and inability to give informed consent	µm nonspherical polyvinyl alcohol particles (Contour Ivalon, Boston Scientific, Natick, MA). Choice of embolic agent was by operator preference or availability. Near-stasis of blood flow in both uterine arteries was considered the embolization endpoint. **MYO (n=7):** Eleven gynecologists performed all surgical procedures at a single institution. All procedures were performed with the patient under general anesthesia according to established techniques. The myomectomies were done via a Pfannenstiel skin incision or a previous abdominal incision whenever possible. **Follow-up:** 6 months	6/33 (4 were 44 years or older; 2 were 36 and 39 years) vs. NR; very similar among groups at all follow-up periods (p>0.05)

AFC: antral follicle count; AMH: anti-mullerian hormone; BMI: body mass index; CI: confidence interval; cm: centimeters; EHR: electronic health record; EMR: electronic medical record; FSH: follicle-stimulating hormone; ICD: International Classification of Diseases; IU: International unites; IV: intravenous; L: Liters; LAM: laparoscopy-assisted MYO; LM: laparoscopic MYO; MR: magnetic resonance; NSAIDs: nonsteroidal anti-inflammatory drugs; NR: not reported; QOL: quality of life; SD: standard deviation; SE: standard error; UFE: uterine fibroid embolization; UFS-QOL; Uterine Fibroid Symptom and Health Related Quality of Life Questionnaire; VAS: visual analog scale