International Journal of Innovative Technologies in Social Science

e-ISSN: 2544-9435

Operating Publisher
SciFormat Publishing Inc.
ISNI: 0000 0005 1449 8214

2734 17 Avenue SW,
Calgary, Alberta, T3E0A7,
Canada
+15878858911
editorial-office@sciformat.ca

ARTICLE TITLE	DIAGNOSIS, TREATMENT AND SOMATIC MANIFESTATION OF ENDOMETRIOSIS: AN UPDATED REVIEW
DOI	https://doi.org/10.31435/ijitss.1(49).2026.4578
RECEIVED	22 November 2025
ACCEPTED	02 January 2026
PUBLISHED	09 January 2026
LICENSE	The article is licensed under a **Creative Commons Attribution 4.0 International License.**

DIAGNOSIS, TREATMENT AND SOMATIC MANIFESTATION OF ENDOMETRIOSIS: AN UPDATED REVIEW

Agnieszka Bugała *(Corresponding Author, Email: agnieszka.bugala1@gmail.com)*
Non-public Healthcare Facility No. 1 in Rumia, Rumia, Poland
ORCID ID: 0009-0008-4920-561X

Aleksandra Markuszewska
POLIMED Medical Center Ltd., Tczew, Poland
ORCID ID: 0009-0002-4625-0446

Julia Wendt
F. Ceynowa Specialist Hospital in Wejherowo, Wejherowo, Poland
ORCID ID: 0009-0003-1819-0455

Adam Andrzejewski
F. Ceynowa Specialist Hospital in Wejherowo, Wejherowo, Poland
ORCID ID: 0009-0006-6024-1828

Dominika Raether
F. Ceynowa Specialist Hospital in Wejherowo, Wejherowo, Poland
ORCID ID: 0009-0003-2116-2236

Olga Wcisłek
F. Raszei Hospital in Poznań, Poznań, Poland
ORCID ID: 0009-0001-6048-249X

Urszula Chmielecka
Regional Specialist Hospital in Wrocław, Wrocław, Poland
ORCID ID: 0009-0007-7305-7170

ABSTRACT

Endometriosis is a chronic gynecological condition affecting millions of women worldwide. It involves the growth of endometrial-like tissue outside the uterine cavity, which leads to significant symptoms and a marked decline in quality of life.

The aim of the Study: The purpose of this work is to present the most recent knowledge on the diagnosis, treatment methods, and somatic symptoms of endometriosis. The analysis covers publications from 2020 to 2025 and focuses on evaluating current medical approaches as well as identifying areas that require further development to improve prognosis and the daily functioning of patients.

Materials and Methods: A structured search of publications from 2020–2025 was conducted in the PubMed and Google Scholar databases using keywords related to diagnostic methods, therapeutic options, and the somatic and psychosomatic symptoms of endometriosis.

Results: Our review highlights that while invasive laparoscopy remains the diagnostic gold standard for endometriosis, advanced imaging techniques like transvaginal ultrasound and MRI are increasingly crucial, particularly for deep infiltrative disease. Despite these tools, significant diagnostic delays persist due to non-specific symptoms and the lack of sensitive non-invasive biomarkers. Current treatments involve hormonal therapies and surgical removal of lesions, but these approaches face challenges such as side effects, recurrence risks, and complications. Crucially, endometriosis is recognized as a multisystem disorder with diverse somatic manifestations including gastrointestinal, urinary, and systemic symptoms like chronic fatigue, alongside significant mental health impacts and increased risks for conditions such as cardiovascular disease and certain cancers

Conclusions: The collected data indicate that endometriosis is a multisystem disorder, and its effective management requires collaboration among specialists from various fields. Such an approach enables better tailoring of therapy and improved symptom control. A major challenge remains the long diagnostic delay, which still ranges from several to more than ten years. Advances in modern imaging techniques and the development of sensitive biomarkers may substantially shorten this period and allow earlier intervention.

KEYWORDS
Endometriosis, Chronic Pelvic Pain, Infertility, Dysmenorrhea

CITATION
Agnieszka Bugała, Aleksandra Markuszewska, Julia Wendt, Adam Andrzejewski, Dominika Raether, Olga Wcisłek, Urszula Chmielecka. (2026). Diagnosis, Treatment and Somatic Manifestation of Endometriosis: An Updated Review. *International Journal of Innovative Technologies in Social Science*. 1(49). doi: 10.31435/ijitss.1(49).2026.

Introduction

Endometriosis is a chronic gynecological condition marked by the growth of endometrial-like tissue outside the uterine cavity [1]. It affects more than one in ten women worldwide [1] and is often accompanied by burdensome, life-disrupting symptoms such as chronic pelvic pain, painful intercourse (dyspareunia), painful defecation (dyschezia), and infertility [1]. These symptoms significantly reduce the quality of life for an estimated 190 million women of reproductive age globally [5], frequently causing notable psychological and social difficulties [18].

Despite its prevalence and the substantial burden it places on patients and healthcare systems, endometriosis continues to be diagnosed with considerable delay [17]. Many patients spend years seeking an accurate diagnosis, often 7 to 9 years from the onset of symptoms [3], [10]. This long period without proper recognition intensifies suffering and may contribute to disease progression and more serious complications.

For many years, endometriosis was regarded mainly as a reproductive system disorder. Recent studies have expanded this view, showing it to be a multisystem condition with a neuroinflammatory basis that extends beyond traditional gynecological definitions [10], [17]. Current evidence highlights its systemic inflammatory character and its wide impact on different physiological systems [17]. The exact causes and mechanisms underlying endometriosis are still not fully understood, and existing theories do not account for all of its diverse presentations. Its multisystem nature and broad range of symptoms complicate diagnosis and emphasize the importance of a multidisciplinary approach to care [11], [17].

This review aims to present the most recent findings on the diagnosis, treatment, and somatic aspects of endometriosis. Based on literature published between 2020 and 2025, it offers an updated and comprehensive view of this complex condition to support better outcomes and improved quality of life for patients.

Methodology

This involved comprehensive searches across PubMed and Google Scholar databases, focusing on peer-reviewed articles published between 2020 and 2025 to ensure the inclusion of the most current research. The search strategy employed specific keywords such as "endometriosis diagnosis," "endometriosis treatment," "somatic manifestations endometriosis," "somatoform disorders endometriosis," and "psychosomatic aspects endometriosis" to capture the breadth of relevant literature. The inclusion criteria specifically targeted studies discussing diagnostic modalities, therapeutic interventions, and the multifaceted somatic manifestations of endometriosis, alongside its psychological comorbidities. Exclusion criteria were applied to remove case reports, editorials, and studies not directly related to human subjects or those focusing solely on animal models, thereby ensuring a strong clinical relevance to the review's scope.

Results

Advances of Endometriosis Diagnosis

Significant progress has been made in improving methods for diagnosing endometriosis. Diagnostic practice is shifting away from relying solely on invasive laparoscopy, with advanced imaging techniques gaining a larger role [5]. Despite these developments, the time needed to reach a correct diagnosis remains long, which affects patients' quality of life and allows the disease to progress [3]. Symptoms are nonspecific, which often leads to misdiagnosis and further delays. As a result, the period between the first symptoms and a confirmed diagnosis averages from 4 to 11 years [12]. Even now, laparoscopy with histological verification is still considered the most reliable and definitive method, often described as the gold standard [4], [12].

The role of advanced imaging techniques

Diagnostics increasingly rely on magnetic resonance imaging and transvaginal ultrasound, which improve detection of deep infiltrating endometriosis and ovarian endometriomas [5]. Both methods have proven usefulness [21]. Precise localisation and assessment of disease severity are important for surgical planning [21].

Transvaginal ultrasound

Transvaginal ultrasound is regarded as the primary non-invasive test for suspected endometriosis [22]. It is quick, widely available, and less costly [24]. It performs well in identifying ovarian endometriomas [22] and allows their assessment [22]. In experienced hands, TVS can reach accuracy comparable to MRI in diagnosing deep infiltrating endometriosis [22]. Its broad availability and overall good diagnostic performance make it the first-line imaging method for women with suspected endometriosis [22].

It also has limitations. Superficial peritoneal lesions remain difficult to detect [22]. The restricted field of view makes it challenging to identify lesions above the rectosigmoid, multifocal intestinal involvement, or extra-pelvic disease [22]. Results depend greatly on the operator's skill [22]. Although effective in many situations, TVS becomes less reliable for certain locations and lesion types.

Magnetic resonance imaging

MRI is a valuable tool in evaluating endometriosis and offers a detailed anatomical view of the pelvis [24]. It provides high spatial resolution and multiplanar imaging [24]. It is especially helpful when ultrasound findings are unclear or when deep infiltrating lesions are suspected [29]. Studies show high diagnostic accuracy for DIE, with sensitivity up to 94% and specificity of 77% [29]. MRI supports detailed preoperative assessment and helps determine the extent of disease [29]. For endometriomas, MRI reaches 94.9% sensitivity and 83.5% specificity [29]. It is useful when experienced sonographers are unavailable or ultrasound results are inconclusive [21].

Despite these advantages, MRI is generally used as a second-line test due to higher cost, possible discomfort, motion artifacts, and the need for expert interpretation. It has not shown clear superiority over TVS in all cases [22]. It also struggles to detect superficial peritoneal disease [22]. Reported sensitivity and specificity vary widely depending on lesion location, technique, and observer experience [21]. For endometriomas, average sensitivities were 77.5% for ultrasound and 67.8% for MRI, with specificities of 84.4% and 83.2% respectively [21].

Biomarker research: promising but not yet clinically decisive

Developing non-invasive diagnostic tools such as biomarker panels could shorten diagnostic time and support better treatment decisions [12]. Various biomarkers have been explored, including CA125, inflammatory markers, proteins, microRNAs, and autoantibodies [12]. CA125 and BDNF levels are often elevated in women with endometriosis [12]. CA125 performs well as a rule-in test in moderate and severe disease, although a negative result does not exclude endometriosis [12]. Higher BDNF levels also correlate with pathways altered in affected women [12].

Despite extensive research, no biomarker or biomarker panel has yet achieved sufficient sensitivity and specificity to replace surgical diagnosis [12]. Currently, no validated biomarkers are used routinely in clinical practice [12]. Further work is necessary to develop non-invasive methods capable of reliably detecting all forms and stages of the disease [12].

Diagnostic laparoscopy

Even with advances in imaging and biomarker studies, laparoscopy with histological confirmation remains the definitive method for diagnosing endometriosis [4], [12]. The procedure involves making a small incision near the navel and inserting a laparoscope to visualise pelvic organs and collect tissue samples. Although highly accurate, its invasive nature contributes to the considerable diagnostic delay many patients experience [12]. This highlights the need for effective, non-invasive tools that would allow earlier detection and more timely treatment.

Current Treatment Modalities

The present approach to treating endometriosis combines medical, surgical and increasingly multidisciplinary strategies. The overall goal is to lessen symptoms and support quality of life, since a curative option is not yet available [33]. Because the disease presents differently across patients, treatment must be individualized with attention to symptoms, reproductive wishes and overall health [1].

Pharmacological Interventions

Drug based therapy centers on hormonal regulation aimed at slowing the progression of endometriotic tissue and easing pain [35]. These treatments act on hormonal pathways that drive the disease, usually by lowering estrogen levels or increasing progesterone exposure [7]. This change suppresses ovulation and reduces menstrual flow, which may promote regression of implants [7]. Pain improvement is linked to lower inflammation and reduced ovarian activity [7].

Combined oral contraceptives are often used first. They contain estrogen and progestin and are effective for dysmenorrhea, particularly with continuous use [7]. The progestin component promotes decidualization and apoptosis of ectopic tissue, while estrogen reduces gonadotropin release and ovarian estrogen production [7]. The estrogen content, however, may contribute to disease progression in some cases [7].

Progestins such as dienogest, norethisterone and medroxyprogesterone acetate are widely used for symptomatic disease and for preventing recurrence after surgery [7]. They act similarly to endogenous progesterone, producing anovulation and pseudo decidualization with subsequent atrophy of lesions because of reduced inflammation and vascular growth [7]. Dienogest can enhance progesterone receptor beta expression in lesions, which may help overcome progesterone resistance [7]. Norethisterone acetate also reduces the size of ovarian endometriomas, although dienogest may provide better symptom control with fewer adverse effects [7]. Depot medroxyprogesterone is effective but long term use is limited because prolonged hypo estrogenism can lead to bone loss [7]. A levonorgestrel releasing intrauterine device can also lessen pelvic pain and menstrual symptoms [7]. Typical adverse effects of progestins include irregular bleeding, headaches and mood shifts, while depot formulations raise concern about bone density loss [7].

If first line hormonal therapy fails or is not tolerated, gonadotropin releasing hormone agonists and antagonists are used [7]. Agonists initially cause a temporary rise in gonadotrophins before desensitizing pituitary receptors, which lowers estrogen levels [7]. This suppressive state contributes to regression of lesions but also causes vasomotor symptoms, vaginal dryness, loss of libido, sleep issues, mood disturbances and bone loss [7]. Add back therapy is often used to reduce these effects [7]. Antagonists suppress pituitary function rapidly by blocking GnRH receptors without the initial flare [7]. Their adverse effects also stem from low estrogen levels and increase with higher doses and longer treatment duration [7].

Non steroidal anti inflammatory drugs are often used as supportive therapy to ease pain through cyclooxygenase inhibition and reduced prostaglandin production [7]. Extended use can lead to gastric injury, cardiovascular risk and potential kidney damage [7].

Other hormonal agents such as aromatase inhibitors and selective progesterone or estrogen receptor modulators are being explored. Due to frequent side effects, current guidelines recommend their use primarily in research contexts or in combination therapy for patients who do not respond to standard hormonal options [7]. Roughly one third of patients do not respond well to combined oral contraceptives and progestins, often due to progesterone resistance [1]. Symptoms commonly recur once treatment stops [7].

Surgical Methods

Surgical management aims to remove or destroy lesions, correct pelvic anatomy and relieve symptoms. Surgery is often considered the most definitive approach, particularly when organ involvement is identified [8]. Removing lesions can result in major symptom relief, especially in deep infiltrating disease [8], and can enhance fertility by restoring anatomy [9]. Minimally invasive surgery remains the preferred route and continues to evolve to improve outcomes and reduce recurrence [9]. Techniques such as transvaginal hydro laparoscopy permit detailed assessment of early stage disease with minimal tissue trauma [9].

Nonetheless, surgery carries several drawbacks. Recurrence is common, affecting up to half of patients, and symptoms are not always fully resolved [36]. These challenges highlight the importance of combining surgery with long term medical therapy and personalized follow up [17]. Surgical risks and postoperative morbidity remain concerns, and repeated operations can worsen pain or lead to chronic postoperative discomfort [7]. Without ongoing medical management, many patients require another procedure within five years [7].

Robot assisted laparoscopy has become a noteworthy development. It provides improved visualization and stable instrument control, which helps during delicate dissection in complex cases such as deep infiltrating endometriosis [8], [9]. It is considered safe and effective, though often associated with longer operating times [9]. Costs and the demanding training required remain significant limitations [9]. Choosing between conventional and robotic techniques depends on disease extent and surgical expertise [38].

Combined strategies that integrate surgery with pre or postoperative medical therapy are frequently used to control disease activity and reduce lesion size, especially when extensive disease makes complete removal challenging [9]. Nerve sparing methods have shown benefits for postoperative urinary function, further improving surgical outcomes [9].

Somatic Manifestations of Endometriosis

Endometriosis is increasingly recognized as a chronic neuroinflammatory disorder that profoundly affects the health, daily activities, and overall quality of life of millions of women globally [10]. Beyond its traditional classification as a gynecological disease, it presents with systemic and extrapelvic manifestations resulting from complex interactions between the immune and nervous systems [11], [17]. Heightened production of inflammatory mediators plays a key role in the variety of pathological processes and contributes to the amplification of pain, which remains one of the most burdensome symptoms [17].

Pain is a central feature of endometriosis, affecting roughly 80% of patients who report chronic pelvic discomfort [10]. Dysmenorrhea is commonly experienced and often worsens during menstrual periods [10]. Many patients also experience non-cyclical pelvic pain as well as pain during sexual activity, defecation, or urination [10]. Flare-ups of pain may occur unpredictably, superimposed on ongoing discomfort [10]. Evidence suggests that these pain symptoms are linked to altered nociceptive processing within the nervous system, which also contributes to associated fatigue and sleep disturbances [10].

Fertility is frequently compromised in women with endometriosis, with 30–50% potentially facing difficulties conceiving [10]. Among those seeking care for infertility, lesions consistent with endometriosis are identified in up to half of the patients [10]. Pregnancies, whether achieved naturally or via assisted reproductive technologies, are associated with an elevated risk of miscarriage, ectopic pregnancy, placenta previa, hemorrhage, and preterm birth [10].

As a multisystem disorder, endometriosis manifests with a variety of symptoms beyond the pelvic region [17]. Chronic fatigue is common and can be worsened by iron deficiency, which occurs more frequently in this population [10]. Gastrointestinal issues such as diarrhea, constipation, and bloating are frequently reported [10]. Abdominal distension, sometimes described as "Endo belly," often becomes more pronounced during the luteal phase of the menstrual cycle [10]. Additional manifestations may include urinary complaints and heavy menstrual bleeding [10].

The chronic and debilitating nature of the disease also exerts a considerable impact on mental health, leading to psychological and social challenges [5]. Affected women often report higher levels of depression, anxiety, and negative mood [10]. Furthermore, endometriosis patients have an increased prevalence of other chronic pain or fatigue-related conditions, including fibromyalgia and chronic fatigue syndrome [10], as well as a higher risk of cardiovascular and autoimmune diseases [37].

In adolescents aged 12 to 18, endometriosis may present with atypical clinical features [10]. Reports from this age group indicate earlier onset of menarche, prolonged menstrual periods, more frequent headaches and nausea, and a higher occurrence of migraines [10].

Conclusions

Endometriosis is a long-lasting condition that affects millions of women worldwide. Its causes remain unclear, and the symptoms vary so widely that recognizing the disease often takes far too long. Many women wait several years between the first signs of trouble and receiving a proper diagnosis, mainly because the complaints are vague and the standard confirmation still depends on invasive procedures.

Diagnostic methods have expanded over time. Laparoscopy, once considered the only reliable way to confirm endometriosis, is now complemented by modern imaging. Transvaginal ultrasound has become the main non-invasive tool, useful especially for identifying ovarian endometriomas and, when performed by an experienced clinician, nearly as reliable as MRI in detecting deep lesions. MRI offers a broad look at the pelvic structures and is valuable for assessing disease spread or clarifying unclear findings, especially in cases where ultrasound results are limited. Both techniques, however, struggle to reveal superficial peritoneal lesions, and their accuracy depends heavily on operator experience. A major issue remains the lack of a trustworthy non-invasive laboratory test, since no biomarker has yet shown sufficient diagnostic strength to replace surgical confirmation.

Treatment is tailored to each patient. It includes medication and surgical options aimed at easing symptoms and improving daily functioning, because a permanent cure is still not available. Hormonal therapies such as oral contraceptives, progestins, and drugs that suppress ovarian hormone production help reduce pain and slow the growth of lesions. They can bring real relief, though side effects like irregular bleeding, mood swings, or loss of bone density may occur. Symptoms also tend to return after stopping treatment. Anti-inflammatory drugs may help with pain but are not recommended for long-term use without caution.

Surgery, most often performed laparoscopically, focuses on removing lesions, restoring normal anatomy, and improving fertility. It can provide strong symptom relief, particularly in deep forms of the disease, but recurrence is common, and some women require additional procedures. Surgery also carries the usual risks of invasive treatment. Robot-assisted laparoscopy offers greater precision in difficult cases, yet it is expensive and requires highly trained surgeons. The best results usually come from combining surgery with ongoing hormonal therapy to limit disease activity and reduce the chance of relapse.

More recent research highlights that endometriosis affects more than just the reproductive system. It involves complex immune and nerve-related mechanisms and can cause symptoms throughout the body. Women may experience digestive or urinary problems, chronic fatigue, or a slightly increased risk of certain cancers, reflecting the broader, multisystem nature of the condition.

For these reasons, an effective approach relies on cooperation between different medical specialties, modern diagnostic methods, personalized treatment, and clear patient guidance. Future scientific work should focus on finding accurate non-invasive biomarkers to speed up diagnosis, which could allow treatment to begin earlier and possibly change how the disease progresses. Understanding endometriosis as a condition involving multiple body systems may also open the door to new therapies and more comprehensive management strategies.

REFERENCES

1. A. S. Laganà, A. Vitagliano, V. Chiàntera, and E. Cicinelli, "Diagnosis and Treatment of Endometriosis and Endometriosis-Associated Infertility: Novel Approaches to an Old Problem," *Journal of Clinical Medicine*, vol. 11, no. 13, p. 3914, Jul. 2022, doi: 10.3390/jcm11133914.
2. P. Rosendo-Chalma *et al.*, "Endometriosis: Challenges in Clinical Molecular Diagnostics and Treatment," *International Journal of Molecular Sciences*, vol. 26, no. 9. Multidisciplinary Digital Publishing Institute, p. 3979, Apr. 23, 2025. doi: 10.3390/ijms26093979.
3. A. W. Horne and S. A. Missmer, "Pathophysiology, diagnosis, and management of endometriosis," *BMJ*. Nov. 14, 2022. doi: 10.1136/bmj-2022-070750.
4. C. V. Anastasiu *et al.*, "Biomarkers for the Noninvasive Diagnosis of Endometriosis: State of the Art and Future Perspectives," *International Journal of Molecular Sciences*, vol. 21, no. 5. Multidisciplinary Digital Publishing Institute, p. 1750, Mar. 04, 2020. doi: 10.3390/ijms21051750.
5. M. Takeuchi, K. Matsuzaki, and M. Harada, "Endometriosis, a common but enigmatic disease with many faces: current concept of pathophysiology, and diagnostic strategy," *Japanese Journal of Radiology*, vol. 42, no. 8. Springer Science+Business Media, p. 801, Apr. 25, 2024. doi: 10.1007/s11604-024-01569-5.
6. G. Kaspute, E. Bareikiene, U. Prentice, I. Uzielienė, D. Ramašauskaitė, and T. Ivaškienė, "A Comprehensive Review of Advanced Diagnostic Techniques for Endometriosis: New Approaches to Improving Women's Well-Being," *Medicina*, vol. 60, no. 11. Multidisciplinary Digital Publishing Institute, p. 1866, Nov. 14, 2024. doi: 10.3390/medicina60111866.
7. L.-H. Chen, W.-C. Lo, H.-Y. Huang, and H. Wu, "A Lifelong Impact on Endometriosis: Pathophysiology and Pharmacological Treatment," *International Journal of Molecular Sciences*, vol. 24, no. 8. Multidisciplinary Digital Publishing Institute, p. 7503, Apr. 19, 2023. doi: 10.3390/ijms24087503.
8. F. A. Ferrari *et al.*, "Robotic surgery for deep-infiltrating endometriosis: is it time to take a step forward?," *Frontiers in Medicine*, vol. 11, Mar. 2024, doi: 10.3389/fmed.2024.1387036.
9. F. Ribeiro and H. Ferreira, "Novel Minimally Invasive Surgical Approaches to Endometriosis and Adenomyosis: A Comprehensive Review," *Journal of Clinical Medicine*, vol. 13, no. 22. Multidisciplinary Digital Publishing Institute, p. 6844, Nov. 14, 2024. doi: 10.3390/jcm13226844.
10. P. T. K. Saunders and A. W. Horne, "Endometriosis: new insights and opportunities for relief of symptoms," *Biology of Reproduction*, Jul. 2025, doi: 10.1093/biolre/ioaf164.
11. L. C. Giudice, A. W. Horne, and S. A. Missmer, "Time for global health policy and research leaders to prioritize endometriosis," *Nature Communications*, vol. 14, no. 1, Dec. 2023, doi: 10.1038/s41467-023-43913-9.
12. B. Herranz-Blanco, E. Daoud, P. Viganò, J. A. García-Velasco, and E. Colli, "Development and Validation of an Endometriosis Diagnostic Method Based on Serum Biomarkers and Clinical Variables," *Biomolecules*, vol. 13, no. 7, p. 1052, Jun. 2023, doi: 10.3390/biom13071052.
13. H. Mariadas, J.-H. Chen, and K.-H. Chen, "The Molecular and Cellular Mechanisms of Endometriosis: From Basic Pathophysiology to Clinical Implications," *International Journal of Molecular Sciences*, vol. 26, no. 6. Multidisciplinary Digital Publishing Institute, p. 2458, Mar. 10, 2025. doi: 10.3390/ijms26062458.
14. M. Salmon, J. Sibéoni, A. Harf, M. R. Moro, and M. Ludot-Grégoire, "Systematic review on somatization in a transcultural context among teenagers and young adults: Focus on the nosography blur," *Frontiers in Psychiatry*, vol. 13. Frontiers Media, p. 897002, Jul. 25, 2022. doi: 10.3389/fpsyt.2022.897002.
15. W. Rief and A. Martin, "How to Use the New DSM-5 Somatic Symptom Disorder Diagnosis in Research and Practice: A Critical Evaluation and a Proposal for Modifications," *Annual Review of Clinical Psychology*, vol. 10, no. 1. Annual Reviews, p. 339, Jan. 04, 2014. doi: 10.1146/annurev-clinpsy-032813-153745.
16. F. Cuffaro, E. Russo, and A. Amedei, "Endometriosis, Pain, and Related Psychological Disorders: Unveiling the Interplay among the Microbiome, Inflammation, and Oxidative Stress as a Common Thread," *International Journal of Molecular Sciences*, vol. 25, no. 12, p. 6473, Jun. 2024, doi: 10.3390/ijms25126473.
17. M. J. Griffiths, A. W. Horne, D. A. Gibson, N. Roberts, and P. T. K. Saunders, "Endometriosis: recent advances that could accelerate diagnosis and improve care," *Trends in Molecular Medicine*, vol. 30, no. 9. Elsevier BV, p. 875, Jul. 10, 2024. doi: 10.1016/j.molmed.2024.06.008.
18. M. Sadłocha, J. Toczek, K. Major, J. Staniczek, and R. Stojko, "Endometriosis: Molecular Pathophysiology and Recent Treatment Strategies—Comprehensive Literature Review," *Pharmaceuticals*, vol. 17, no. 7. Multidisciplinary Digital Publishing Institute, p. 827, Jun. 24, 2024. doi: 10.3390/ph17070827.
19. M. A. Ochoa-Bernal and A. T. Fazleabas, "The Known, the Unknown and the Future of the Pathophysiology of Endometriosis," *International Journal of Molecular Sciences*, vol. 25, no. 11, p. 5815, May 2024, doi: 10.3390/ijms25115815.
20. K. Upson, "Environmental Risk Factors for Endometriosis: a Critical Evaluation of Studies and Recommendations from the Epidemiologic Perspective," *Current Epidemiology Reports*, vol. 7, no. 3, p. 149, Aug. 2020, doi: 10.1007/s40471-020-00236-3.

21. A. Tong, A. G. Cope, T. L. Waters, J. S. McDonald, and W. M. VanBuren, “Best Practices: Ultrasound Versus MRI in the Assessment of Pelvic Endometriosis,” *American Journal of Roentgenology*, vol. 223, no. 6, Sep. 2024, doi: 10.2214/ajr.24.31085.
22. A. Daniilidis, G. Grigoriadis, D. Dalakoura, M. N. D’Alterio, S. Angioni, and H. Roman, “Transvaginal Ultrasound in the Diagnosis and Assessment of Endometriosis—An Overview: How, Why, and When,” *Diagnostics*, vol. 12, no. 12. Multidisciplinary Digital Publishing Institute, p. 2912, Nov. 23, 2022. doi: 10.3390/diagnostics12122912.
23. G. Gedefaw *et al.*, “Proteomics approach to discovering non-invasive diagnostic biomarkers and understanding the pathogenesis of endometriosis: a systematic review and meta-analysis,” *Journal of Translational Medicine*, vol. 22, no. 1. BioMed Central, p. 685, Jul. 26, 2024. doi: 10.1186/s12967-024-05474-3.
24. A. I. G. Bauşic *et al.*, “Transvaginal Ultrasound vs. Magnetic Resonance Imaging (MRI) Value in Endometriosis Diagnosis,” *Diagnostics*, vol. 12, no. 7. Multidisciplinary Digital Publishing Institute, p. 1767, Jul. 21, 2022. doi: 10.3390/diagnostics12071767.
25. S. Guerriero *et al.*, “Advances in Imaging for Assessing Pelvic Endometriosis,” *Diagnostics*, vol. 12, no. 12. Multidisciplinary Digital Publishing Institute, p. 2960, Nov. 26, 2022. doi: 10.3390/diagnostics12122960.
26. S. M. El-Maadawy, N. Alaaeldin, and C. B. Nagy, “Role of preoperative ultrasound mapping in the surgical management of deep infiltrating endometriosis: a prospective observational study,” *The Egyptian Journal of Radiology and Nuclear Medicine*, vol. 52, no. 1, Jun. 2021, doi: 10.1186/s43055-021-00526-w.
27. S. W. Young *et al.*, “Society of Radiologists in Ultrasound Consensus on Routine Pelvic US for Endometriosis,” *Radiology*, vol. 311, no. 1. Radiological Society of North America, Apr. 01, 2024. doi: 10.1148/radiol.232191.
28. J. Avery *et al.*, “Noninvasive diagnostic imaging for endometriosis part 2: a systematic review of recent developments in magnetic resonance imaging, nuclear medicine and computed tomography,” *Fertility and Sterility*, vol. 121, no. 2. Elsevier BV, p. 189, Dec. 16, 2023. doi: 10.1016/j.fertnstert.2023.12.017.
29. S. Harth, F. Roller, F. Zeppernick, I. Meinhold-Heerlein, and G. A. Krombach, “Deep Infiltrating Endometriosis: Diagnostic Accuracy of Preoperative Magnetic Resonance Imaging with Respect to Morphological Criteria,” *Diagnostics*, vol. 13, no. 10, p. 1794, May 2023, doi: 10.3390/diagnostics13101794.
30. X. Zhang, T. He, and W. T. Shen, “Comparison of physical examination, ultrasound techniques and magnetic resonance imaging for the diagnosis of deep infiltrating endometriosis: A systematic review and meta-analysis of diagnostic accuracy studies,” *Experimental and Therapeutic Medicine*. Spandidos Publishing, Jul. 24, 2020. doi: 10.3892/etm.2020.9043.
31. I. Thomassin-Naggara *et al.*, “ESUR consensus MRI for endometriosis: indications, reporting, and classifications,” *European Radiology*, vol. 35, no. 11, p. 7260, May 2025, doi: 10.1007/s00330-025-11579-0.
32. P. D. Corte, M. Klinghardt, S. von Stockum, and K. Heinemann, “Time to Diagnose Endometriosis: Current Status, Challenges and Regional Characteristics—A Systematic Literature Review,” *BJOG An International Journal of Obstetrics & Gynaecology*. Wiley, Oct. 07, 2024. doi: 10.1111/1471-0528.17973.
33. H. Grundström, H. Kilander, P. Wikman, and M. Olovsson, “Demographic and clinical characteristics determining patient-centeredness in endometriosis care,” *Archives of Gynecology and Obstetrics*, vol. 307, no. 4, p. 1047, Dec. 2022, doi: 10.1007/s00404-022-06887-5.
34. “Shining a light on endometriosis: time to listen and take action,” *BMC Medicine*, vol. 21, no. 1, Mar. 2023, doi: 10.1186/s12916-023-02820-y.
35. K. Nirgianakis, K. Egger, D. R. Kalaitzopoulos, S. Lanz, L. Bally, and M. D. Mueller, “Effectiveness of Dietary Interventions in the Treatment of Endometriosis: a Systematic Review,” *Reproductive Sciences*, vol. 29, no. 1. Springer Nature, p. 26, Mar. 24, 2021. doi: 10.1007/s43032-020-00418-w.
36. E. A. Kalopedis, A. Zorgani, Д. А. Зиновкин, M. Barri, C. D. Wood, and M. Z. I. Pranjol, “Leveraging the role of the microbiome in endometriosis: novel non-invasive and therapeutic approaches,” *Frontiers in Immunology*, vol. 16. Frontiers Media, Sep. 16, 2025. doi: 10.3389/fimmu.2025.1631522.
37. M. Garvey, “Endometriosis: Future Biological Perspectives for Diagnosis and Treatment,” *International Journal of Molecular Sciences*, vol. 25, no. 22. Multidisciplinary Digital Publishing Institute, p. 12242, Nov. 14, 2024. doi: 10.3390/ijms252212242.
38. Л. М. Михалева *et al.*, “Malignant Transformation and Associated Biomarkers of Ovarian Endometriosis: A Narrative Review,” *Advances in Therapy*, vol. 37, no. 6. Adis, Springer Healthcare, p. 2580, May 08, 2020. doi: 10.1007/s12325-020-01363-5.
39. M. Pavone *et al.*, “Robotic assisted versus laparoscopic surgery for deep endometriosis: a meta-analysis of current evidence,” *Journal of Robotic Surgery*, vol. 18, no. 1. Springer Science+Business Media, May 16, 2024. doi: 10.1007/s11701-024-01954-2.
40. S. Legendri, M. Carbonnel, A. Féki, G. Moawad, G. Aubry, and A. Vallée, “Improvement of Post-Operative Quality of Life in Patients 2 Years after Minimally Invasive Surgery for Pain and Deep Infiltrating Endometriosis,” *Journal of Clinical Medicine*, vol. 11, no. 20, p. 6132, Oct. 2022, doi: 10.3390/jcm11206132.

41. B. Chen, L. Zhao, R. Yang, and T. Xu, “New insights about endometriosis-associated ovarian cancer: pathogenesis, risk factors, prediction and diagnosis and treatment,” *Frontiers in Oncology*, vol. 14, Feb. 2024, doi: 10.3389/fonc.2024.1329133.
42. S. J. Holdsworth-Carson, C. Ng, and U. P. Dior, “Editorial: Comorbidities in Women With Endometriosis: Risks and Implications,” *Frontiers in Reproductive Health*, vol. 4, p. 875277, Jun. 2022, doi: 10.3389/frph.2022.875277.
43. T. Tulandi and P. Vercellini, “Growing evidence that endometriosis is a systemic disease,” *Reproductive BioMedicine Online*, vol. 49, no. 3. Elsevier BV, p. 104292, May 24, 2024. doi: 10.1016/j.rbmo.2024.104292.
44. Ż. Kimber-Trojnar, A. Pilszyk, M. Niebrzydowska, Z. Pilszyk, M. Ruszała, and B. Leszczyńska-Gorzelak, “The Potential of Non-Invasive Biomarkers for Early Diagnosis of Asymptomatic Patients with Endometriosis,” *Journal of Clinical Medicine*, vol. 10, no. 13. Multidisciplinary Digital Publishing Institute, p. 2762, Jun. 23, 2021. doi: 10.3390/jcm10132762.