

Precis: History, physical exam, and expert guided imaging are essential to effectively evaluate and diagnose women with chronic pelvic pain and suspected endometriosis.

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A practical guide to the clinical evaluation of endometriosis associated pelvic pain

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Special Article

Title: A practical guide to the clinical evaluation of endometriosis associated pelvic pain

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**Precis**

History, physical exam, and expert guided imaging are essential to effectively evaluate and diagnose women with chronic pelvic pain and suspected endometriosis.

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## Abstract

Endometriosis associated pain (EAP) has a significant impact on the quality of life of those affected and their families. Recognizing that endometriosis is a chronic condition associated with an impairment in function and negative social impact, there is a shift towards reducing diagnostic delays and initiating timely management. This article provides a comprehensive and practical approach to the clinical diagnosis of EAP, which can subsequently facilitate prompt and directed treatment. The key components of the history, physical exam and high-quality imaging to evaluate suspected EAP and related pain conditions are presented. Currently, biomarkers have limited utility in the diagnosis of endometriosis, but research in this area continues; development of a reliable non-invasive test for endometriosis may further improve early identification of this condition.

**Key Words**

Endometriosis; endometriosis biomarkers; endometriosis diagnosis; endometriosis imaging;  
pelvic pain

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## Introduction

The diagnosis of endometriosis may be challenging given the varying clinical presentations and heterogeneity of symptoms. Delayed diagnosis is common with reported median delay as lengthy as 9-10 years from onset of symptoms to diagnosis [1]; the delay in diagnosis is greater for women who present with pelvic pain compared to those who report infertility [2]. Additionally, pain may be refractory to conventional therapies for the treatment of endometriosis, particularly when other comorbid pain conditions are present, which can lead to frustration for providers and their patients due to inadequate symptom relief after treatment initiation [3,4]. Endometriosis associated pain (EAP) has a significant negative impact on health-related quality of life for women suffering from these conditions [5]. Women reporting chronic and inflammatory conditions such as endometriosis have significant functional impairment, increased fatigue, and depressed mood [2,6,7].

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There is an identified need to establish an earlier diagnosis in these patients, which may in turn lead to earlier care and improved quality of life [8,9]. This may be possible through a systematic evaluation including a directed history, physical exam and appropriate expert guided imaging [10]. Concurrent consideration of common related chronic pain conditions is also important to help guide appropriate care. The goal of this article is to provide the clinician with a simple and reproducible clinical approach to the evaluation of EAP.

## History

The history is both an evaluation of the patient's symptoms but also acknowledgement of her journey to date. Classic historical evaluation of the patient's pain experience is essential, including the onset and quality of the pain, as well as exacerbating and relieving factors. The impact on one's function and quality of life as a result of the pain over time should be

documented and helps the clinician understand the patient's goals. Although pain is a cardinal symptom of endometriosis, it is important to distinguish pain symptoms that may be attributed to a diagnosis of endometriosis or may be due to other common pain conditions (Table 1).

### **Patient Goals**

Perhaps the most important aspect of the clinical exchange in patients being evaluated for EAP is the patient's personal goals for management. While pain management may appear to be a reasonable target for care, some patients may actually present with a primary goal of achieving a pregnancy. The goal of the health care provider is to help the patient reach their desired end point; it is important to clarify the patient's expectations for care in the short versus long term at the initial consultation.

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### **Past medical history**

*Pertinent medical history*, current medications, as well as family history of endometriosis, chronic pain, abnormal uterine bleeding, and gynecologic cancer should be obtained. Past response to therapeutic modalities should be considered along with adherence with recommended treatments to help direct therapeutic options moving forward. A history of oral contraceptive use for severe primary dysmenorrhea has been associated with surgical confirmation of endometriosis later in life, especially deep endometriosis [11]. In addition, one's family history may reveal first degree relatives who have been affected including siblings, which has been shown to have a significant correlation based on twin and family studies. [10]

### **Past surgical history**

It is essential to obtain past surgical reports and images (when possible) to help determine the approach, findings and pathology. Past surgical confirmation or absence of endometriosis is helpful but can be misleading. For example, deep endometriosis may be missed on routine laparoscopy based on surgeon experience and/or location of the disease [12]. In addition, the presence of endometriosis does not necessarily explain the pain experienced by the patient and may just be one component of a complex pain experience or an incidental non-contributory finding. Finally, response to previous surgery is important, especially if the patient has been treated for endometriosis. Limited or short-lived pain improvement after surgical management by an expert team should raise the question of other chronic pain sources or syndromes.

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### **Endometriosis associated pain symptoms**

**EAP is typically characterized by numerous painful symptoms** including cyclic pelvic pain, dysmenorrhea, deep dyspareunia, dysuria, and dyschezia [13,14]. Catamenial hematuria or hematochezia may also be present in the case of urinary tract or bowel endometriosis. A qualitative study revealed that the most commonly reported symptoms related to endometriosis were pain, dyspareunia, heavy/irregular bleeding, and infertility [15]. Other reported symptoms were fatigue, bloating, bladder urgency, bowel/bladder symptoms, and sleep disturbances due to pain. Significant overlap of these symptoms often exists. Although symptoms are typically exacerbated during menstruation, they may begin prior to the start of menstrual bleeding and persist days after menstruation has stopped. **Adenomyosis** should also be considered in the assessment of these cases, and it was found in as high as 90% of patients with endometriosis in an MRI evaluation [16]. While many overlapping symptoms may be present in both

endometriosis and adenomyosis, the presence of heavy menstrual bleeding in addition to the other symptoms should put adenomyosis on the differential diagnosis list. [17].

**Infertility** is another major sequela of endometriosis and may be the only indicator of the disease. Symptoms of pain, menstrual irregularities, and fatigue have been shown to be more prevalent among infertile women with endometriosis compared with infertile women without endometriosis [18].

Although less common, “**extra-pelvic**” **pain symptoms** should be evaluated, especially if cyclic in nature. Notable symptoms include cyclical surgical scar swelling and pain (scar endometriosis), catamenial pneumothoraces or shoulder pain (thoracic or diaphragmatic endometriosis) and cyclical sciatica (nerve involvement) [19].

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### **Chronic Pelvic Pain and Chronic Overlapping Pain Conditions**

Women with endometriosis may manifest central sensitization which involves a dynamic remodeling of the central nervous system and may contribute to the development and maintenance of EAP [20,21]. Non cyclic or daily pain may be indicative of these processes as well as other chronic pelvic pain conditions. **Chronic pelvic pain** is defined as non-cyclic pain greater than 6 months duration localized to the anatomic pelvis, anterior abdominal wall at or below the umbilicus, the lumbosacral back, or the buttocks, and is of sufficient severity to cause functional disability or lead to medical care [22]. Chronic pelvic pain is best addressed by a multimodal interdisciplinary approach, therefore early identification is critical.

Endometriosis remains one of the most commonly identified conditions in women with chronic pelvic pain [23,24]. However, *the pain may be due to or co-existent with other chronic pelvic pain conditions*. The U.S. Congress and National Institutes of Health recently termed

chronic overlapping chronic pain conditions, which reflects a cluster of co-existing chronic pain disorders solely or predominantly affecting women. These disorders include endometriosis, vulvodynia, temporomandibular disorders, myalgic encephalomyelitis/chronic fatigue syndrome, irritable bowel syndrome, interstitial cystitis/painful bladder syndrome, fibromyalgia, chronic tension-type and migraine headache, and chronic low back pain [25]. Research reveals that these conditions share common underlying disease pathophysiology, primarily in the immune, neural, and endocrine systems. Delay in diagnosis and delay to effective treatment is common, with subsequent worsening of symptoms leading to poorer health outcomes and diminished quality of life.

**Myofascial pain syndrome** is characterized by tenderness with palpation of muscles and connective tissue [26]. This should be considered when a patient describes cramping, shooting, and radiating pain in these regions which is exacerbated by movement, activity, sexual intercourse, and any engagement of the affected abdominal wall, hip, back, or pelvic floor muscle groups. This can occur in any muscle, but commonly arises in the abdominal wall and pelvic floor musculature in women with EAP. Notably, while these symptoms may worsen during the menstrual cycle, they will most commonly occur non cyclically. If a patient describes having daily or almost daily pain, myofascial pain should be high on the differential diagnosis.

**Bowel and bladder symptoms** commonly occur in women with endometriosis, but it is important to evaluate for other bowel and bladder pain etiologies like irritable bowel syndrome and painful bladder syndrome. The diagnosis of **irritable bowel syndrome** is made by the Rome IV criteria [27]: recurrent abdominal pain on average at least one day/week in the last three months, associated with two or more of the following – 1) related to defecation, 2) a

change in frequency of stool, 3) a change in form of stool. The presence of recurrent abdominal pain in association with abnormal bowel habits are the defining features, often in the absence of examination or objective criteria [28].

**Painful bladder syndrome** is an unpleasant sensation (pain, pressure, discomfort) perceived to be related to the urinary bladder, associated with lower urinary tract symptoms for more than 6 weeks duration, in the absence of infection of other identifiable causes [29]. This criterion of 6 weeks duration allows for prompt initiation of treatment. Pain symptoms associated with painful bladder syndrome are often described as suprapubic pressure or discomfort related to bladder filling, marked urinary urgency/frequency, worse with dietary irritants, and improved with urination.

Lastly, symptoms associated with **pubertal vulvodynia and vulvodynia** can co-exist with endometriosis, however certain historical elements can help differentiate these diagnoses.

**Pudendal neuralgia** is characterized by burning, shooting pain in the vulvar region that is typically unilateral and worsened with sitting. A diagnosis of pudendal neuralgia can be established using Nantes criteria [30], with diagnosis requiring the following five characteristics: 1) pain in the distribution of the pudendal nerve extending from the clitoris to the anus, 2) pain worsened by sitting, 3) pain does not wake the patient from sleep, 4) pain with no objective sensory impairment, 5) pain is relieved by anesthetic nerve block. **Vulvodynia** is defined by the International Society for the Study of Vulvovaginal Disease as vulvar pain of at least 3 months' duration, without a clear identifiable cause [31]. This pain may be generalized or localized to a certain vulvar region, like the vestibule, and may occur spontaneously or have to be provoked. It has been proposed that screening for provoked vestibulodynia be performed in the pelvic pain population it was also associated with worse deep dyspareunia, requiring more intensive multidisciplinary treatment compared to women without provoked vestibulodynia [32].

**Table 1:** Clinical tip: History for Endometriosis-Associated Pain

### **Physical Exam**

The physical examination is an important component in the evaluation of those with suspected endometriosis-related pain. The exam, with a focus on abdominal, pelvic, and rectovaginal exams, helps the clinician further refine the differential diagnosis for the presenting complaint(s) and helps direct the appropriate imaging that may be required. The order of the examination is important and should consider that the skin, mucosal layers and underlying muscle and fascia require gentle examination prior to the traditional gynecologic bimanual examination. This layer by layer approach allows for an appreciation of the complexity of the pain experience and helps “map” the pain. The practitioner should also keep in mind that the physical exam will likely be painful for the patient and therefore must be performed gently and with care to establish trust. The patient should be informed that while the exam may produce pain, the goal is to detect the anatomic location(s) of tenderness and correlate these with the area(s) where she experiences pain.

The clinician should engage the patient during the physical exam to ascertain if specific maneuvers during the **abdominal, single digit and bimanual examinations** elicit or reproduce any aspects of her pelvic pain or dyspareunia. This “pain-mapping” helps identify multiple pain generators that may be present, this can help guide where to start management by addressing the patient’s primary or most bothersome sources of pain. This also involves the patient and validates her symptoms, while facilitating patient education regarding various pain conditions (Table 2 & Table 3).

### **Inspection & Patient Directed Evaluation**

The physical exam should be performed methodically in attempts to reproduce the patient's pain. The exam should first include a general assessment of the patient's affect and posture. For instance, if it is noted that a woman is standing during the interview and unable to sit due to worsened pain, this may be suggestive of pudendal neuralgia. There are many additional musculoskeletal components, including back and sacroiliac joint evaluations and standing and supine maneuvers which may add pertinent details to the patient's overall physical functioning and prompt physical therapy referral.

Next, upon inspection of the abdomen, surgical scars should be noted as well as any concern for incisional hernias which could contribute to pain. Any reticular interlacing skin hyperpigmentation or erythema on the abdomen indicative of excessive heating pad use should be noted. (Figure 1)

The patient should then be prompted to point to the areas of pain. Some **manifestations of central sensitization** especially relevant to women with chronic pelvic pain include allodynia (pain in response to a non-noxious stimulus), hyperalgesia (pain response greater than expected to a noxious stimulus), as well as referred pain (pain perceived outside of the area of noxious stimulus) [33,34]. The classic scratch test in the distribution of the ilioinguinal/iliohypogastric nerves will reveal allodynia (typically manifested as burning or searing pain in the lower abdominal quadrants extending to the mons) when these nerves are entrapped or injured iatrogenically at the time of fascial closure of either a Pfannenstiel incision or laparoscopic port site >10 mm in size [35].

## Abdominal examination

Superficial palpation of the abdomen should be performed by the clinician to elicit pain. Any palpable scar nodularity and tenderness in areas where the patient feels cyclic pain and/or bleeding may be suggestive of abdominal wall scar endometriosis. Next, single digit examination is performed. The classic exam finding consistent with myofascial pain is the presence of **myofascial trigger points**, which are palpable nodules or taut bands of muscle in a sustained state of contracture [33]. These myofascial trigger points are palpable with a single digit on the abdominal wall or pelvic floor musculature and are often associated with referred pain to other areas of the pelvis, abdomen, or lower back. Studies have shown that myofascial trigger points are associated with endometriosis [36]. Abdominal wall myofascial trigger points associated with endometriosis are most commonly isolated medially along the rectus abdominis muscles or laterally along the external oblique, psoas, or iliacus muscles.

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**Carnett's sign** is an easily reproducible exam technique whereby palpation of the trigger point is held at maximum tenderness by the examiner while the patient is asked to contract the abdominal wall by raising their head and shoulders or raising their legs – if pain is stable or worsened during abdominal musculature contraction, the diagnosis of myofascial trigger points and chronic abdominal wall pain is confirmed [37].

**Table 2:** Clinical tip: Engage and educate patient during exam to evaluate pain manifestations

## Pelvic Examination

The pelvic exam is performed next and is a crucial component of the examination. The pelvic exam begins with inspection and superficial palpation of the vulva. **Vulvodynia** is confirmed by noting areas of pain with Q-tip palpation of the vulva, starting at the inner thigh, moving towards the labia majora and minora, clitoris and clitoral hood, perineum, and focusing on the vestibule where pain often localizes.

Nantes criteria for establishing the diagnosis of pudendal neuralgia was previously discussed.

**Tinel's sign** is an exam finding that can aid in diagnosis of pudendal neuralgia, whereby significant tenderness and even reproducible vulvar pain or paresthesia is elicited by palpation over the ischial spine on vaginal or rectal exam [38] where the pudendal nerve traveling medial to the ischial spine has been compressed between the coccygeus/sacrospinous ligament complex and sacrotuberous ligaments, though is not necessary for diagnosis.

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**Monodigital transvaginal exam** is performed next to identify pelvic floor myofascial trigger points distally along the superficial and deep transverse perineii, bulbocavernosus, levator ani (comprised of puborectalis, iliococcygeus, and pubococcygeus), and obturator internus muscles; and more proximally along the coccygeus and piriformis muscles. Proximal pelvic floor musculature trigger points are often noted with symptoms of deep dyspareunia, which can have significant overlap with similar manifestations from endometriosis.

Exam findings of **painful bladder syndrome** may include single digit tenderness transvaginally along the bladder base and urethra. Concomitant pelvic floor musculature trigger points, particularly in the obturator internus muscles, are also commonly found on exam.

**Bimanual pelvic examination** with palpation of the uterus helps assess for pain with uterine manipulation, position of the uterus (anteverted, retroverted), and uterine mobility. Pain with uterine manipulation may be present with endometriosis, adenomyosis, or even with degenerating fibroids. An enlarged tender uterus may help to narrow the differential diagnosis to adenomyosis or degenerating fibroids. Additionally, a bimanual exam finding of retroverted/retroflexed fixed uterus may be indicative of significant adhesive disease secondary to advanced endometriosis. Palpable painful fixed adnexal masses on exam are concerning for endometriomas. Palpation of tender nodules along the vaginal fornices, cul de sac, uterosacral ligaments, or on rectovaginal exam is suggestive of deep infiltrating endometriosis. Finally, speculum exam will reveal any evidence of vaginal nodules consistent with deep infiltrating endometriosis (DIE) (Figure 2). These physical exam findings may prompt imaging as the next step in evaluation.

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**Table 3:** Clinical tip: Diagnosis of possible concomitant chronic pelvic pain disorders

## Imaging

Imaging has likely been the greatest advancement for the diagnosis of endometriosis in the past decade. From a time when the classic teaching was that “imaging cannot identify endometriosis”, we have now been able to “see” this complex disease when it is deep or cystic. While peritoneal endometriosis may still evade imaging detection, the deep and ovarian forms can be identified in experienced hands and this will most definitely improve targeted care for our patients (Table 4).

High-quality imaging also allows for identification and evaluation of concomitant disease such as adenomyosis. Targeted imaging for certain presentations on history will not only aid in diagnosis (e.g. abdominal scar endometriosis, diaphragm/lung endometriosis) but also help us identify other non-gynecologic conditions (e.g. nerve impingement due to spinal disc disease, chronic gastrointestinal complications) [39].

### Transvaginal sonography

Transvaginal sonography (TVS) is typically the first line radiological assessment for diagnosis of endometriosis [40]. It is important to recognize that there is considerable heterogeneity in the information that can be gained during ultrasound [41,42]. First, it is not possible to identify peritoneal endometriosis with currently available TVS technology. Second, many sonography reports will only mention endometriomas due to limited expertise in identifying deep disease. Finally, expanded imaging of the genitourinary and gastrointestinal system in cases of endometriosis may not occur with routine “pelvic ultrasound”. However, when performed by a **trained expert in endometriosis imaging**, dynamic TVS has been shown to accurately diagnose deep endometriosis [43-45].

The International Deep Endometriosis Analysis (IDEA) group recently published a consensus opinion calling for adoption of a systematic, standardized approach in the sonographic evaluation of the pelvis in women with suspected endometriosis [46]. They outline a step wise approach in the evaluation of suspected endometriosis, starting with evaluation of the uterus and adnexa, and then assessing for possible “**soft markers**” of endometriosis (uterine sliding sign, ovarian mobility, presence of endometriomas, uterine retroversion and site specific tenderness), as well as obliteration of the cul-de-sac and evidence of DIE nodules. While it may not be feasible to implement the complete IDEA group guidelines in all centers/practices, the

“soft markers” may help triage patients to the most appropriate providers. Patients who screen positive should have further assessment to characterize the location and extent of endometriotic lesions. The role of diagnostic laparoscopy has limited value in those with an imaging diagnosis of deep endometriosis. Those with clinical and/or radiologic evidence of symptomatic DIE should be referred to experienced centers/practitioners who may provide the full range of surgical and/or medical therapies for management.

### **Magnetic Resonance Imaging (MRI)**

A recent systematic review and meta-analysis examining the performance of TVS and MRI for detection of DIE concluded that the diagnostic performance of TVS and MRI were similar in the area of rectosigmoid, uterosacral ligaments and rectovaginal septum disease [47]. It should be noted that the centers included in this work have expertise in TVS for endometriosis, the quality of which may be highly variable in real-world clinical practice. This finding was different from previous literature, demonstrating potentially lower sensitivity of TVS, compared to MRI in the diagnosis of rectovaginal and uterosacral DIE [41,42,48-50]; however, the authors felt that this may be attributed to the fact that this review included only studies comparing both imaging modalities in the same set of patients. Two- and three-dimensional MRI has also been compared and both techniques appear to have similar accuracy with respect to DIE localization [51].

Importantly, an appropriate MRI protocol is required to accurately diagnose and evaluate extent of endometriosis. Gynecologists relying on MRI imaging should communicate with their radiology colleagues to ensure that they employ appropriate protocols to optimize diagnosis and evaluation of endometriotic lesions. The European Society of Urogenital Radiology outlines recommendations for to optimize such a protocol [52]. In clinical practice, **MRI may be**

*employed when access to expert sonologist is not possible, or findings from such are equivocal.*

### **Ancillary tests**

In certain clinical scenarios, ***ancillary tests such as colonoscopy, cystoscopy, rectal sonography, and computed tomography*** may be indicated for the patient presenting with possible endometriosis [49]. These may be beneficial in the evaluation of DIE lesions, such as those involving bowel, bladder, or ureters. These tests may be used to evaluate other potential conditions that may co-exist with endometriosis or present with similar clinical attributes.

***Access to high-quality imaging for endometriosis is essential for the clinician providing care to women with endometriosis.*** This facilitates reliable diagnosis of endometriomas and

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DIE diagnosis, allowing for initiation of medical management. Superficial or mild endometriosis may not be detected on imaging, however women presenting with symptoms and physical exam findings consistent with this diagnosis may be counselled that they are suspected to have endometriosis and a trial of medical management may be initiated [10]. Accurate imaging is also essential for surgical planning, as the various phenotypes of endometriosis may necessitate a very different surgical approach and expertise. Recognition of the valuable role of diagnostic imaging in the diagnosis of endometriosis is reflected in endometriosis guidelines, recommending providers to initiate medical management without laparoscopic confirmation of pathology and instead plan surgery when indicated for therapeutic interventions [53,54].

### **Biomarkers**

***There are currently no validated biomarkers available for the diagnosis of endometriosis***

in clinical practice. However, a clinician may employ the use of a number of tests in order to investigate patients' clinical presentation and rule out other conditions which may present with similar findings as endometriosis. For instance, blood count, serum or urine culture, as well as cervical/vaginal swabs may be employed to rule out infectious etiology.

The most common biomarker which has been investigated for endometriosis is CA-125. In one meta-analysis, it was demonstrated that at a cut off value of >16.0-17.6 U/ml the mean sensitivity of the test was 56% (95% confidence interval (CI) 24-88%) and mean specificity of 91% (95% CI 75-100%) [55]. A meta-analysis by Hirsch et al. concluded that measuring CA-125 at a cut-off of >30 U/ml has a sensitivity of 52.4% (95% CI 37.9-66.4%) and specificity of 92.7% (95% CI 89.4-95.1%) [56]. Overall, CA-125 seems to be hampered in its sensitivity because it is mostly elevated in the advanced endometriosis stages as opposed to all stages, while its specificity can be poor because of its rise in other gynecological diseases [56]. Importantly, CA-125 may also be utilized in risk assessment of an ovarian mass [57].

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The role of bloodwork in the evaluation of endometriosis may expand beyond the classic biomarker and instead be considered as an adjunct to assist with understanding the patient's reproductive status. Although not useful for the diagnosis of endometriosis, when surgery is being planned, an evaluation of ovarian reserve through blood testing (e.g. anti-Müllerian hormone level) may be considered. This may be particularly useful in patient pursuing fertility who is having an ovarian cystectomy for an endometrioma [58].

A number of other serum and endometrial biomarkers are currently under investigation for the diagnosis of endometriosis. Many are promising based on their involvement in inflammation and oxidative stress, the autoimmune system, as well as cell survival, adhesion, and migration. For detailed review of biomarkers currently under investigation, the reader is referred to recent

reviews by Dorien (2018) [59], Nisenblat (2016) [55,60], and Gupta (2016) [61]. Mitochondrial DNA deletions have also been explored as biomarkers for endometriosis and may be promising to aid in the non-invasive diagnosis of endometriosis [62].

With increasing recognition regarding the importance of early and accurate non-surgical diagnosis and management of endometriosis, there is a need to develop a reliable non-invasive biomarker in order to complement clinical assessment and imaging investigations. This effort is challenged by the heterogenous nature of both the clinical presentation, as well as the pathological phenotype of the condition [63]. Furthermore, patients with endometriosis are also more likely to be diagnosed with a number of other comorbid conditions, such as migraines, autoimmune disease, and certain malignancies, which may influence biomarker results [64-66]. Establishing a standardized approach to the classification of endometriosis, both in the clinical and research settings, is necessary to aid the effort of developing such biomarkers. This strategy is stressed by the World Endometriosis Research Foundation, who also provide tools for such standardization [67,68].

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### **Practical Application of the Clinical Evaluation**

Health care providers of all backgrounds (e.g. nursing, family physicians and specialists) require a practical approach to the first line evaluation of those presenting with pelvic pain and infertility. Endometriosis should be considered high on the list possible contributors. When the history leads us to consider endometriosis, imaging can then further assist in the diagnosis of DIE (a radiologic diagnosis of endometriosis). If the imaging is negative in experienced centers, then one may suspect endometriosis of the peritoneal subtype and offer patients empiric therapy options or laparoscopic surgery for diagnosis **and** treatment, including excision/ablation of all endometriotic lesions.

## Summary

Implementation of a standardized and practical approach to the clinical diagnosis of EAP can enable practitioners to more readily address their patient's symptoms by initiating therapy without delaying diagnosis. The outcomes of earlier diagnosis and management have not been investigated, however, this could potentially prevent long-term ramifications of this disease including infertility, persistent pain, central sensitization, and development of chronic overlapping pain conditions.

When a patient suffering with pelvic pain presents for care, they come to us with an important story and physical evidence of what may be behind their struggle. The differential diagnosis in women presenting with pelvic pain and/or infertility should always include endometriosis.

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Listening to the patient and engaging in an organized inquisitive discussion allows the clinician to further hone the differential diagnosis based on this history alone. This clinical evaluation should always include the patient's goals, experience of pain, medical comorbidities and personal perspectives and values.

Next, careful evaluation and examination, directed by the history, helps to further our understanding of the underlying presenting complaint. The exam should be systematic, and include patient directed concerns (e.g. "it hurts right here"). There is much to learn from methodical examination of the skin, fascia, muscles, vaginal tissue and pelvic organs, and the essential information gained from this examination cannot be replaced by any imaging nor should it be delayed until the day of surgery. This approach to diagnosis allows the clinician to have a better understanding of the complexity of the patient's pain symptoms (e.g. Is there myofascial pain or is the pain isolated to the posterior vaginal fornix on deep palpation of a nodule?)

Imaging is of tremendous help in cases involving DIE and endometrioma. However, the imaging, whether TVS or MRI, is dependent on the experience of the imager and institution. Increased knowledge of the advances in imaging for endometriosis will lead to greater radiologic diagnosis and aid in planning care for patients. Additionally, the search continues for the “simple” blood test to diagnose and follow endometriosis. The heterogeneity of the disease and clinical presentation will be the greatest challenges to the development of a clinically useful single test.

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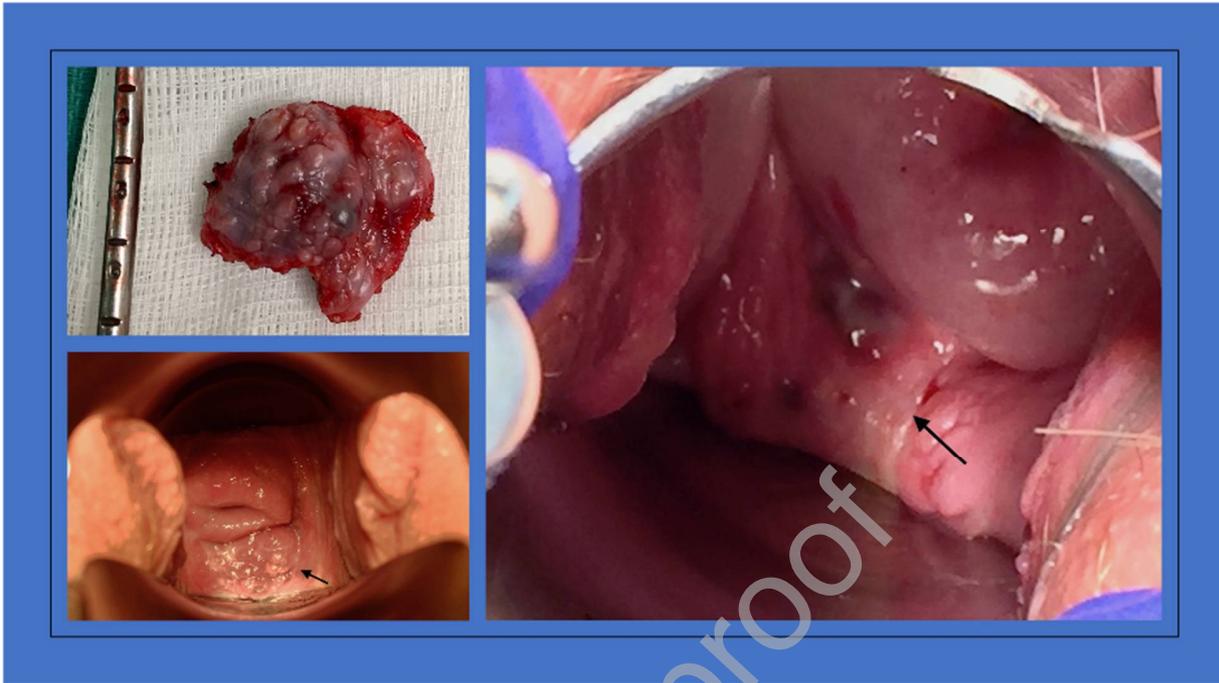
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**Figure 1:** Skin changes due to chronic "hot water bottle" application to the skin for pain relief.



**Figure 2:** Vaginal endometriosis lesions on physical exam (arrows) and final excision specimen

(Image 1.png in high resolution)

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Table 1

**Clinical tip - History for Endometriosis-Related Pain****Consider Endometriosis:**

- D's: Dysmenorrhea, Dyspareunia, Dysuria, Dyschezia, Diffuse pelvic pain
- Infertility
- Cyclical/catamenial symptoms outside the pelvis (e.g. lung, nerve, scar)
- Personal history of oral contraceptive use in past
- Family history
- Response to past medications, surgeries

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**Consider Concomitant Chronic Pelvic Pain and Overlapping conditions:**

- Inadequate response to traditional therapy for endometriosis
- Widespread body pain without a cyclical exacerbation
- Focal pain sources (myofascial, nerve related, bowel/bladder, vulvar pain)

Table 2

**Clinical tip: Engage and educate patient during exam to evaluate pain manifestations**

Physical exam finding	Definition/diagnosis	How it relates to endometriosis
Allodynia	Pain from a stimulus that does not normally provoke pain	Allodynia detected more often and in more sites in women with pain [36]
Hyperalgesia	Increased pain response from a stimulus that normally provokes pain	Regional hyperalgesia observed more commonly in women with endometriosis and pain [36]
Muscle trigger point (abdomen, pelvic floor)	Symptomatic painful taut bands of muscle in sustained state of contracture	Identified secondary to endometriosis and chronic pain conditions, compounds experience of pain
Central sensitization	Increased responsiveness and hypersensitivity, manifested by allodynia, hyperalgesia, and referred pain	Important mechanism in endometriosis-related pain, pain may become independent of peripheral stimulus

Table 3

**Clinical tip: Common\* chronic pelvic pain disorders****\*this list is not exhaustive of all pain generators or conditions**

Chronic pelvic pain condition	Key history	Key physical exam
Myofascial pain syndrome	Cramping, shooting, radiating pain, worsened by movement	Muscle trigger points - palpable taut bands of muscle and connective tissue
Pudendal neuralgia	Nantes criteria: 1) Pain in distribution of the pudendal nerve extending from clitoris to anus, 2) Pain worsened by sitting, 3) Pain does not wake patient from sleep, 4) No objective sensory impairment, 5) Pain relieved by anesthetic nerve block	Tinel's sign: reproducible vulvar pain/paresthesia elicited by palpation over ischial spine on vaginal or rectal exam (not necessary for diagnosis)
Vulvodynia	Vulvar pain of at least 3 months' duration, without a clear identifiable cause	Cotton swab palpation of vulva, pelvic floor trigger points are common
Painful bladder syndrome	Pain, pressure, discomfort related to the bladder, associated with lower urinary tract symptoms for > 6 weeks duration, in absence of infection of other identifiable causes	Possible tenderness along the bladder base and urethra, pelvic floor trigger points are common
Irritable bowel syndrome	Recurrent abdominal pain in association with abnormal bowel habits	No specific objective diagnostic criteria
Iliohypogastric/ilioinguinal neuralgia	Burning/searing pain to light touch in nerve distribution after iatrogenic injury or entrapment	Allodynia with scratch test

Table 4

**Clinical tip: Imaging and Biomarkers for Suspected Endometriosis**

- Ultrasound can help identify patients with deep endometriosis by trained and experienced imaging specialists. Soft markers on ultrasound may help triage patients to centers that can provide additional evaluation and experienced care for deep endometriosis.
- MRI is helpful for deep endometriosis imaging and requires less technical experience. However, the diagnostic capability of MRI is still dependent on an adoption of an appropriate protocol and interpretation of this imaging modality.
- There is no reliable diagnostic biomarker that is specific for endometriosis. While blood tests may be used in practice none have been shown to provide superior benefit to history, physical exam, and high-quality imaging.