Review Article

Abnormal Uterine Bleeding: Diagnostic and Therapeutic Approach

Nicole Mariela Garro Castillo[1*], Maria Isabella Trejos Chiulli[2], María Paula Alfaro Murillo[3], Edgardo José Soto Junco[4], Lola Dive Chagnon[5]

[1]Medical Doctor, Independent Researcher, Limón, Costa Rica
[2]Medical Doctor, Independent Researcher, Puntarenas, Costa Rica
[3]Medical Doctor, San Vicente de Paul Hospital, Heredia, Costa Rica
[4]Medical Doctor, Ricardo Jiménez Núñez Clinic, San José, Costa Rica
[5]Medical Doctor, Independent Researcher, Heredia, Costa Rica
[*]Corresponding author email: **ngarrocastillo@hotmail.com**

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Abstract

Abnormal uterine bleeding is a frequent gynecological condition with a significant impact on women's health across the lifespan. It arises from complex alterations in normal menstrual physiology, including hormonal imbalance, impaired endometrial hemostasis, abnormal angiogenesis, and structural uterine pathology. Under physiological conditions, coordinated fluctuations of estrogen and progesterone regulate endometrial proliferation, differentiation, and shedding, while effective hemostatic mechanisms limit menstrual blood loss. Disruption of these processes leads to excessive, irregular, or prolonged bleeding. Clinically, abnormal uterine bleeding may present as acute or chronic disease, a distinction that guides diagnostic urgency and therapeutic decision-making. Its etiology varies according to age, with ovulatory dysfunction predominating in adolescents and younger women, and structural causes such as polyps, fibroids, and adenomyosis becoming more prevalent during the perimenopausal period. Postmenopausal bleeding warrants particular attention because of its association with endometrial malignancy. The FIGO PALM–COEIN classification system provides a standardized framework to distinguish structural from non-structural causes and supports a systematic diagnostic approach. Evaluation of abnormal uterine bleeding relies on detailed clinical history, characterization of bleeding patterns, physical and gynecological examination, and

identification of red flags suggestive of malignancy. Diagnostic assessment integrates laboratory testing to exclude anemia and systemic disorders, imagingprimarily transvaginal ultrasoundto identify structural abnormalities, and endometrial sampling in patients at increased risk for endometrial pathology. Management is individualized and stepwise, prioritizing medical therapy with non-hormonal or hormonal options based on etiology, symptom severity, and reproductive goals. Surgical and interventional treatments are reserved for refractory cases or severe bleeding. Special populations, including adolescents, perimenopausal women, and patients with bleeding disorders or on anticoagulation therapy, require tailored strategies and close follow-up.

Key words

Endometrial hemostasis, ovulatory dysfunction, uterine pathology, imaging modalities, hormonal therapy, fertility preservation.

Introduction

Abnormal uterine bleeding (AUB) is a frequent gynecological problem with substantial clinical relevance across different populations and age groups. Epidemiological data indicate that its prevalence is considerable, with approximately 34.1% of women affected in certain settings, such as Jimma town in Ethiopia, underscoring its global burden [1]. The condition is particularly common during the perimenopausal period, a stage characterized by hormonal fluctuations and an increased prevalence of benign uterine pathologies, including endometrial polyps and uterine myomas, which contribute to abnormal bleeding patterns [2]. In high-income countries, the magnitude of the problem remains significant, as evidenced by data from the United States showing that abnormal uterine bleeding accounts for nearly 1.4 million cases annually, highlighting its widespread impact on women's health and healthcare systems [3].

Beyond its high prevalence, abnormal uterine bleeding exerts a marked negative effect on quality of life, particularly among adolescents. The condition interferes with daily functioning, leading to school absenteeism and reduced participation in social and family activities. Evidence shows that 36.2% of adolescents with abnormal uterine bleeding report missing school, while 63.8% avoid family-related activities, reflecting the social and educational consequences of the disorder. These disruptions are closely linked to the physical manifestations of abnormal uterine bleeding, including severe menstrual pain and the development of anemia, which further intensify fatigue, functional limitation, and overall impairment of well-being [4, 5].

The high prevalence and symptomatic burden of abnormal uterine bleeding translate into substantial healthcare utilization. A significant proportion of affected individuals seek urgent medical care, resulting in frequent emergency department visits. In the United States, 11.2% of emergency visits related to abnormal uterine bleeding culminate in inpatient admissions, reflecting the considerable strain placed on healthcare resources by this condition [6]. Management often requires a combination of medical and surgical interventions, and notable disparities in treatment patterns have been observed, particularly in relation to patient age and race or ethnicity, which may influence diagnostic pathways and therapeutic decision-making [3].

Within this context, accurate diagnosis and appropriate management are essential components of care. Diagnostic evaluation commonly relies on imaging modalities, with transvaginal ultrasound and Doppler ultrasound playing a central role in the identification of structural uterine abnormalities and other underlying causes of abnormal bleeding [7]. Therapeutic strategies are tailored to symptom

severity and etiology, frequently incorporating hormonal treatments as first-line options, while surgical approaches such as hysteroscopy and endometrial ablation are reserved for selected cases. The choice of treatment reflects a balance between symptom control, underlying pathology, and patient-specific factors, reinforcing the need for an individualized and evidence-based approach to abnormal uterine bleeding management [2, 3].

The objective of this article is to provide a comprehensive and structured overview of abnormal uterine bleeding, integrating current evidence on its epidemiology, clinical impact, diagnostic evaluation, and therapeutic management.

Methodology

This review on abnormal uterine bleeding was conducted through a structured analysis of current scientific literature, with the objective of integrating epidemiological data, clinical evaluation, diagnostic strategies, and therapeutic approaches relevant to comprehensive patient management. The methodological approach focused on established classification systems, underlying pathophysiological mechanisms, diagnostic modalities, and medical and surgical treatment options essential for accurate diagnosis and individualized care.

The literature search was performed using PubMed, Scopus, and Web of Science, selecting peer-reviewed articles published between 2021 and 2026 in English or Spanish. Studies were included if they addressed key aspects of abnormal uterine bleeding, including epidemiology, classification frameworks, clinical presentation, diagnostic imaging, laboratory assessment, endometrial evaluation, and therapeutic management. Non–peer-reviewed publications, studies with incomplete or duplicated data, or those not directly related to the diagnostic or therapeutic evaluation of abnormal uterine bleeding were excluded. The search strategy was guided by the following keywords: *Endometrial hemostasis, ovulatory dysfunction, uterine pathology, imaging modalities, hormonal therapy, fertility preservation.*

All selected publications were critically analyzed using a qualitative and integrative approach to extract and synthesize evidence on diagnostic algorithms, treatment selection, and outcomes across different patient populations. Artificial intelligence tools were used as complementary resources to support thematic organization and conceptual linkage between epidemiology, pathophysiology, diagnosis, and management. This methodological framework enabled the development of a coherent and concise synthesis of current evidence, emphasizing a structured and individualized approach to improving diagnostic accuracy, therapeutic decision-making, and clinical outcomes in patients with abnormal uterine bleeding.

Menstrual Physiology and Pathophysiology of AUB

The normal menstrual cycle is regulated by a complex and tightly coordinated interplay of hormonal signals that control endometrial proliferation, decidualization, and subsequent shedding. Estrogen and progesterone play central roles in this process by preparing the endometrium for potential embryo implantation and, in the absence of pregnancy, orchestrating the orderly breakdown and elimination of the functional endometrial layer. This cyclical process is classically divided into proliferative, secretory, and menstrual phases, each governed by precise hormonal fluctuations that ensure menstrual regularity and physiological balance [5].

Within this physiological framework, effective endometrial hemostasis is essential to prevent excessive blood loss during menstruation. Hemostatic control is achieved through a coordinated sequence of vasoconstriction, platelet aggregation, and activation of the coagulation cascade, all of which act to limit

bleeding once endometrial shedding begins [5]. Disruption of these mechanisms can compromise vascular stability and lead to abnormal uterine bleeding. Alterations in angiogenesis and vascular maturation result in fragile, poorly supported, and highly permeable vessels, increasing susceptibility to excessive or prolonged menstrual bleeding [8].

Abnormal uterine bleeding arises through multiple interrelated mechanisms that disturb the normal regulation of the endometrium. Hormonal imbalance represents a central pathogenic pathway, especially in the context of ovulatory dysfunction, where irregular or absent ovulation leads to disordered endometrial proliferation and unpredictable shedding patterns [9]. In parallel, structural abnormalities of the uterus, including endometrial polyps, uterine fibroids, and adenomyosis, can physically distort the uterine cavity and disrupt normal endometrial architecture, thereby promoting irregular or excessive bleeding [10]. Additionally, primary endometrial disorders characterized by aberrant angiogenesis further contribute to abnormal bleeding by impairing vascular integrity and normal hemostatic responses [8].

The interplay between hormonal and structural abnormalities is particularly relevant in the pathophysiology of abnormal uterine bleeding. Alterations in the balance between estrogen and progesterone are a hallmark of abnormal uterine bleeding associated with ovulatory dysfunction, a condition that not only causes irregular bleeding but is also linked to an increased risk of endometrial hyperplasia and malignant transformation. Structural lesions, such as polyps and myomas, are frequently identified in women presenting with abnormal uterine bleeding and can be accurately detected through hysteroscopic evaluation, which allows direct visualization of intrauterine pathology [9, 10]. Furthermore, dysregulation of angiogenic mediators, including vascular endothelial growth factor and platelet-derived growth factor, plays a significant role in disease pathogenesis by influencing vascular maturation, stability, and permeability, thereby reinforcing the multifactorial nature of abnormal uterine bleeding [8, 11].

Classification of Abnormal Uterine Bleeding

Abnormal uterine bleeding can be clinically categorized into acute and chronic forms, a distinction that is essential for guiding diagnostic urgency and management strategies. Acute abnormal uterine bleeding refers to a sudden episode of heavy uterine bleeding that necessitates immediate medical intervention to prevent ongoing blood loss and potential hemodynamic instability. This presentation is characterized by its abrupt onset and severity and may become life-threatening if not promptly recognized and treated. In contrast, chronic abnormal uterine bleeding is defined as bleeding that is abnormal in volume, duration, or frequency and has been present for most of the preceding six months. Although typically less severe than acute episodes, chronic abnormal uterine bleeding exerts a sustained negative impact on physical well-being and quality of life [12].

The clinical presentation and underlying causes of abnormal uterine bleeding vary significantly according to age, making age-related considerations a critical component of evaluation. During the perimenopausal period, abnormal uterine bleeding is particularly common because of hormonal fluctuations and declining ovarian function. In this age group, structural etiologies such as endometrial polyps and uterine myomas are more prevalent, and comprehensive assessment is required to exclude premalignant or malignant conditions [2]. In younger women, particularly those under 40 years of age, abnormal uterine bleeding is less frequently associated with malignancy; however, metabolic and endocrine disorders such as polycystic ovarian syndrome and obesity increase the risk of endometrial hyperplasia and must be carefully considered during evaluation [13]. In postmenopausal women, recurrent

uterine bleeding is most often related to benign conditions such as endometrial polyps, yet the persistent risk of endometrial cancer necessitates vigilant investigation and follow-up [14].

To standardize terminology and facilitate etiological classification, the FIGO PALM–COEIN classification system provides a comprehensive framework for abnormal uterine bleeding. This system distinguishes between structural and non-structural causes. Structural etiologies, encompassed by the PALM category, include polyps, adenomyosis, leiomyoma, and malignancy or hyperplasia. These conditions are typically identifiable through imaging modalities such as transvaginal ultrasound or magnetic resonance imaging, which allow visualization of uterine anatomy and focal lesions. In contrast, non-structural causes, classified under the COEIN category, include coagulopathy, ovulatory dysfunction, endometrial causes, iatrogenic factors, and entities not yet classified. These conditions are more commonly diagnosed through clinical assessment and targeted laboratory evaluation rather than imaging alone [7].

Among structural causes, endometrial polyps and uterine myomas are especially frequent in perimenopausal women and represent common sources of significant uterine bleeding. Their presence may necessitate surgical intervention, particularly when bleeding is persistent or refractory to medical therapy [2, 10]. Adenomyosis, characterized by the presence of endometrial tissue within the myometrium, also contributes to abnormal uterine bleeding, often in association with dysmenorrhea and uterine enlargement. Malignancy, particularly endometrial cancer, represents the most serious structural cause and must be excluded in women with risk factors or atypical bleeding patterns [7].

Non-structural causes further contribute to the heterogeneity of abnormal uterine bleeding presentations. Ovulatory dysfunction is frequently observed in younger women and leads to irregular and unpredictable bleeding patterns, often in association with conditions such as polycystic ovarian syndrome [13]. Primary endometrial disorders, including endometrial hyperplasia, arise from hormonal imbalances and altered endometrial responsiveness, resulting in excessive or prolonged bleeding. Additionally, iatrogenic causes related to medical interventions, particularly hormonal therapies, can disrupt normal bleeding patterns and must be carefully evaluated within the clinical context [8].

Clinical Evaluation

A detailed medical history represents a cornerstone in the clinical evaluation of abnormal uterine bleeding, as it provides critical information for identifying potential underlying etiologies. A comprehensive history should encompass prior gynecological conditions, family history, and relevant lifestyle factors, all of which may influence bleeding patterns. For example, a history of uterine fibroids or sexually transmitted infections has been shown to significantly increase the risk of abnormal uterine bleeding, underscoring the importance of targeted historical inquiry in affected patients [1]. In adolescents, careful history-taking extends beyond etiological assessment and allows evaluation of the broader impact of abnormal uterine bleeding on daily functioning. In this population, heavy menstrual bleeding is frequently associated with school absenteeism and avoidance of routine activities, reflecting the substantial burden of the condition on quality of life [4].

Accurate characterization of the bleeding pattern is a fundamental component of the diagnostic process. Distinct bleeding presentations, including metrorrhagia, heavy menstrual bleeding, and intermenstrual bleeding, are commonly reported among women with abnormal uterine bleeding and provide important clues regarding potential causes [1]. In adolescents, irregular menstrual cycles and excessive menstrual flow are particularly

prevalent and may lead to iron-deficiency anemia, further amplifying the negative effects of abnormal uterine bleeding on physical health and overall well-being [15].

The clinical evaluation is complemented by a thorough physical and gynecological examination, which is essential for identifying structural abnormalities associated with abnormal uterine bleeding. Conditions such as uterine fibroids and adenomyosis can often be suspected on clinical examination and further evaluated using imaging modalities, particularly transvaginal ultrasound, which plays a central role in structural assessment [7]. In perimenopausal women, careful speculum examination is especially important to exclude cervical and vaginal sources of bleeding, as these may mimic or coexist with uterine causes and require distinct management strategies [2].

Equally important is the identification of red flags and risk factors that may signal more serious underlying pathology or influence management decisions. Clinical features suggestive of malignancy, such as postmenopausal bleeding or marked changes in established bleeding patterns, warrant prompt and thorough investigation to exclude endometrial or other gynecological cancers. Additional risk factors, including the use of oral anticoagulants, can exacerbate bleeding severity, particularly in women with preexisting uterine fibroids, and should be carefully assessed during clinical evaluation. Furthermore, documented racial disparities in the diagnostic evaluation of abnormal uterine bleeding, such as differences in access to or utilization of diagnostic ultrasound, highlight the need for equitable and standardized approaches to care in order to ensure accurate diagnosis and optimal outcomes for all patients [16, 17].

Diagnostic Approach

Laboratory evaluation constitutes a fundamental component of the diagnostic approach to abnormal uterine bleeding, particularly in the identification and exclusion of systemic causes. Routine laboratory testing commonly includes assessment of hemoglobin and iron levels to evaluate for anemia, a frequent consequence of heavy or prolonged menstrual bleeding. In addition, hormonal assessments play an important role in clarifying potential endocrine contributors. Thyroid function tests are useful for excluding thyroid disorders that may alter menstrual regularity, while measurement of human chorionic gonadotropin levels is essential to rule out pregnancy as a cause of abnormal bleeding [2].

In parallel with laboratory testing, imaging modalities are pivotal in the evaluation of abnormal uterine bleeding, particularly for the identification of structural uterine pathology. Transvaginal ultrasound is widely regarded as the first-line imaging technique due to its accessibility and effectiveness in visualizing the uterus and endometrium, allowing detection of conditions such as uterine fibroids, adenomyosis, and endometrial abnormalities, including malignancy [2, 7]. Doppler ultrasound further enhances diagnostic accuracy by enabling assessment of uterine and endometrial blood flow, thereby assisting in the characterization of vascular patterns associated with various uterine lesions [18]. When initial imaging findings are inconclusive or insufficient for definitive diagnosis, more advanced techniques, such as saline infusion sonohysterography or pelvic magnetic resonance imaging, may be employed to provide detailed visualization of the uterine cavity and surrounding structures [7].

Endometrial assessment represents a critical step in the diagnostic workup, particularly in patients at increased risk for endometrial pathology. Endometrial biopsy is recommended for women over 40 years of age and for those with additional risk factors for endometrial cancer, as it allows direct evaluation of the endometrial tissue for hyperplasia or malignant transformation. Alternative methods, such as Tao brush endometrial cytology, offer a less invasive means

of sampling and have demonstrated high sensitivity for detecting atypical hyperplasia and endometrial carcinoma; however, this technique has not yet been adopted as standard practice. Regardless of the sampling method, endometrial evaluation is essential for distinguishing benign from malignant conditions, particularly in premenopausal women with persistent or unexplained abnormal uterine bleeding [19, 20].

The integration of laboratory findings, imaging results, and endometrial assessment facilitates a comprehensive differential diagnosis of abnormal uterine bleeding. This process involves distinguishing structural causes, such as uterine fibroids and endometrial polyps, from non-structural etiologies, including coagulopathies and ovulatory dysfunction [7]. In perimenopausal women, the differential diagnosis must also account for physiological changes associated with hormonal fluctuations, while maintaining a high index of suspicion for premalignant and malignant conditions [2]. The combined use of imaging techniques and targeted endometrial evaluation plays a decisive role in narrowing the range of potential diagnoses and guiding the selection of appropriate, etiology-specific treatment strategies [18].

Medical Management

The management of abnormal uterine bleeding is guided by several general treatment principles that emphasize accurate diagnosis, individualized care, and alignment with patient preferences. An appropriate diagnostic evaluation is fundamental and relies on a comprehensive medical history, thorough physical and gynecological examination, and the use of imaging modalities such as transvaginal ultrasound or magnetic resonance imaging to identify structural causes, including uterine fibroids and adenomyosis [2, 7]. Establishing the underlying etiology allows for targeted therapy and helps avoid unnecessary or ineffective interventions. Treatment decisions should be individualized according to patient age, severity of symptoms, comorbid conditions, and reproductive goals. Shared decision-making is essential to determine both the need for treatment and the most appropriate therapeutic approach, particularly when balancing symptom control with fertility preservation [2, 21].

Non-hormonal therapies play an important role in the management of abnormal uterine bleeding, especially in women who cannot or prefer not to use hormonal treatments. Non-steroidal anti-inflammatory drugs are commonly prescribed to reduce menstrual blood loss and alleviate dysmenorrhea and are particularly effective in cases of heavy menstrual bleeding. Antifibrinolytic agents, most notably tranexamic acid, act by inhibiting fibrinolysis and have been shown to significantly decrease menstrual blood loss. Owing to their efficacy and favorable safety profile, antifibrinolytics are considered first-line therapy for heavy menstrual bleeding in appropriate patients [21, 22].

Hormonal treatment options constitute a central component of therapy for many women with abnormal uterine bleeding. The levonorgestrel-releasing intrauterine system is among the most effective interventions for reducing menstrual blood loss and has been consistently associated with improvements in quality of life. This option is particularly advantageous for women who also desire reliable contraception [21, 23]. Oral progestogens and combined oral contraceptives are widely used to regulate menstrual cycles and decrease bleeding volume, especially in cases of anovulatory bleeding (2). In selected cases, gonadotropin-releasing hormone antagonists may be employed preoperatively to reduce uterine and myoma size, improve hemoglobin levels, and alleviate symptoms, thereby potentially delaying or avoiding surgical intervention [24].

Preservation of fertility remains a key consideration in the management of abnormal uterine bleeding among women of reproductive age. When surgical intervention is indicated, fertility-sparing techniques such as myomectomy or hysteroscopic procedures are preferred over more radical options. The intraoperative use of

adhesion-reducing substances is recommended to minimize postoperative adhesions and reduce the risk of adverse reproductive outcomes. In parallel, medical management is often favored for conditions such as adenomyosis, where conservative treatment strategies may effectively control symptoms while avoiding surgical procedures that could compromise future fertility [25].

Surgical and Interventional Management

Surgical treatment for abnormal uterine bleeding is generally indicated when conservative medical management proves ineffective or when rapid symptom control is required because of severe bleeding or clinically significant anemia. Structural uterine pathology is a frequent driver of these decisions, particularly in the presence of uterine fibroids. Large or symptomatic fibroids represent a common indication for surgical intervention, and hysterectomy is often considered the definitive treatment for fibroid-related bleeding when fertility preservation is no longer a concern [26]. In addition, specific clinical scenarios, such as retained products of conception with marked vascularity, may necessitate prompt surgical management to reduce the risk of uncontrolled hemorrhage and associated morbidity [27].

Advances in surgical techniques have expanded the role of minimally invasive procedures in the management of abnormal uterine bleeding. Uterine artery embolization is a well-established, minimally invasive option that acts by reducing uterine and fibroid blood supply, thereby controlling bleeding and inducing fibroid volume reduction. This approach is particularly valuable for patients seeking alternatives to hysterectomy and for those in whom uterine preservation is desired [26, 8]. Hysteroscopic surgery represents another effective minimally invasive strategy, especially for fibroids located within the uterine cavity or associated with cesarean scar defects. This technique allows targeted removal of pathology while minimizing damage to surrounding tissue and is associated with favorable safety and efficacy profiles [28]. More recently, innovative approaches such as vaginal natural orifice transluminal endoscopic surgery for transient uterine artery occlusion have been developed to control intraoperative bleeding during high-risk procedures, offering the potential to preserve fertility while reducing surgical trauma [29].

Despite the availability of conservative and minimally invasive options, definitive surgical treatments remain necessary in selected cases. Hysterectomy continues to be the most definitive intervention for abnormal uterine bleeding, particularly when other therapies have failed or when a permanent solution is preferred by the patient [26]. For women who wish to retain reproductive potential, myomectomy, performed through laparoscopic or open approaches, provides an effective means of addressing fibroid-related bleeding while preserving the uterus [30].

The management of acute severe bleeding constitutes a distinct clinical scenario requiring immediate intervention to stabilize the patient and prevent life-threatening outcomes. In this context, uterine artery embolization may be employed as an emergency measure to achieve rapid hemorrhage control [27]. Surgical techniques such as uterine compression sutures and vascular ligation, including O'Leary's bilateral uterine artery ligation, are also effective strategies for controlling severe hemorrhage, particularly in postpartum settings [31]. When conventional measures are unsuccessful, novel interventions such as uterine packing with chitosan-covered tamponade devices have demonstrated utility in arresting refractory, life-threatening uterine bleeding, highlighting the evolving landscape of surgical management in severe abnormal uterine bleeding [32].

Special Considerations, Follow-up, and Conclusions

Abnormal uterine bleeding in adolescents and perimenopausal women presents age-specific

clinical challenges that require tailored evaluation and management strategies. Adolescents with abnormal uterine bleeding frequently report severe menstrual pain and significant school absenteeism, underscoring the substantial impact of the condition on daily functioning and overall quality of life. In this population, effective management strategies commonly include hormonal treatments to regulate bleeding patterns and iron supplementation to address or prevent iron-deficiency anemia, both of which contribute to symptomatic improvement and functional recovery [4]. In perimenopausal women, abnormal uterine bleeding is often related to structural uterine abnormalities, such as fibroids or adenomyosis. Accurate evaluation in this age group relies heavily on imaging modalities, including ultrasound and magnetic resonance imaging, which are essential for identifying underlying pathology and guiding appropriate management [7].

Special consideration is required for patients with systemic or bleeding disorders, as these conditions may significantly influence both presentation and management. Adolescents presenting with heavy menstrual bleeding may have undiagnosed bleeding disorders, highlighting the importance of comprehensive diagnostic evaluation, including coagulation screening. Despite its clinical relevance, such screening remains underutilized, potentially delaying appropriate diagnosis and management in this vulnerable population [33]. Similarly, women receiving anticoagulation therapy face an increased risk of abnormal uterine bleeding, necessitating careful therapeutic planning to prevent complications such as hemorrhagic ovarian cysts. In these patients, progestin-only contraceptives and tranexamic acid are recommended options for controlling menorrhagia while balancing the risks associated with anticoagulation [34].

Regular follow-up is a critical component of abnormal uterine bleeding management, allowing ongoing assessment of treatment effectiveness and timely modification of therapeutic strategies. This is particularly important in adolescents, in whom initial interventions may be insufficient and further diagnostic evaluation, treatment adjustment, or referral to specialized care may be required [34]. Prognosis varies according to the underlying etiology and adherence to treatment, with structural causes of abnormal uterine bleeding more frequently necessitating surgical intervention to achieve definitive resolution [7].

In conclusion, abnormal uterine bleeding is a multifaceted condition that demands individualized management plans based on patient age, underlying pathology, and clinical context. In adolescents, effective care must address both the physical manifestations of bleeding and its emotional and social consequences, whereas perimenopausal women often require thorough structural evaluation to guide management decisions [4, 7]. Clinicians should maintain a high index of suspicion for bleeding disorders in adolescents and exercise particular vigilance when managing abnormal uterine bleeding in reproductive-aged women receiving anticoagulation therapy, as timely diagnosis and appropriate intervention are essential for optimizing outcomes [33, 34].

Conclusions

Abnormal uterine bleeding results from complex interactions between hormonal imbalance, impaired endometrial hemostasis, abnormal angiogenesis, and structural uterine pathology, which together disrupt normal menstrual regulation and lead to heterogeneous clinical presentations.

Accurate classification and diagnosis of abnormal uterine bleeding require a structured, age-appropriate approach, integrating clinical evaluation with the FIGO PALM–COEIN system, targeted laboratory testing, imaging, and endometrial assessment.

Management of abnormal uterine bleeding should be individualized and stepwise, prioritizing medical therapy when possible, reserving surgical interventions for refractory or severe cases, and ensuring regular follow-up to optimize outcomes across different patient populations.

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