DMPA. Menopause should be suspected in a woman older than 45 years.

Amenorrhea and oligomenorrhea may be caused by pathologic changes at any point in the endometrial-ovarian-pituitary-hypothalamic axis. The differential diagnosis for secondary amenorrhea is broad and is categorized by the primary organ failure or dysfunction: ovarian, hypothalamic, pituitary, and uterine (in descending order of frequency).

Evaluation should begin with a history, physical examination to assess comorbidities and anatomy, and urine test for human chorionic gonadotropin (HCG). If not pregnant, further evaluation should include serum levels of TSH, prolactin, and FSH. For women who have evidence of hyperandrogenism, the serum levels of total testosterone, 17-hydroxyprogesterone, and dehydroepiandrosterone sulfate (DHEAS) should be measured. Additional testing and evaluation should be pursued based on these findings.

For women with elevated prolactin levels, normal or low FSH levels with no clear reason (e.g., weight loss, exercise, recent illness, stress) or with visual symptoms or headaches, magnetic resonance imaging (MRI) of the brain should be performed to look for pituitary abnormalities. A high serum FSH level indicates premature ovarian failure, and women should be counseled regarding management, fertility concerns, and estrogen replacement. If a woman has a normal FSH level and a history of uterine manipulation, she should have a progestin challenge to rule out outflow tract abnormalities. Women with low or normal FSH levels and a history consistent with functional hypothalamic amenorrhea due to weight loss or exercise should be counseled about healthy weight and physical activity.

Abnormal Bleeding

Abnormal bleeding can be caused by many abnormalities, including anovulation, endometrial pathology, and coagulopathies. Women with *polymenorrhea* have a cycle less than 21 days long; women with *oligomenorrhea* have an interval greater than 40 days. Women with excessive bleeding in duration or quantity have *menorrhagia. Menometrorrhagia* is excessive bleeding at irregular intervals.

Women should be asked about their bleeding, including the onset, duration, pattern, and quantity of bleeding. A classification system (Fig. 70-2) for abnormal uterine bleeding (AUB) is organized by cause (i.e., structural or nonstructural). It has eliminated the terms *menorrhagia* and *menometrorrhagia* and replaced them with *heavy menstrual bleeding* and *intermenstrual bleeding*, respectively. In the PALM-COEIN classification, the four main structural causes for AUB are *p*olyp, *a*denomyosis, *l*eiomyoma, and *m*alignancy or hyperplasia, and the five nonstructural causes are *c*oagulopathy, *o*vulatory dysfunction, *e*ndometrial, *i*atrogenic, and *n*ot yet classified.

Evaluation of AUB assesses for evidence of ovulatory cycles by inquiring about symptoms such as breast tenderness, cramping, and fluid retention before the onset of bleeding. Absence of these symptoms suggests anovulatory bleeding and focuses the differential diagnosis on hormonal causes. Anovulatory bleeding is the result of failed ovulation and the absence of a luteal phase. The ovary secretes estrogen unopposed by progesterone and leads to continued proliferation of the endometrium. This endometrium is unstable, which results in periodic, irregular, and often heavy bleeding. Bleeding due to coagulopathy follows a typically ovulatory pattern and produces heavy, regular bleeding. A personal or family history of bleeding disorders should be sought, because a significant fraction (5% to 32%) of women with heavy menstrual bleeding have an underlying bleeding disorder.

A general physical examination seeks evidence of anemia and a systemic cause of AUB such as thyroid disease or polycystic ovary syndrome. Genitourinary examination should verify the source of bleeding and may identify a cervical polyp, which typically is associated with postcoital bleeding, or an enlarged uterus, suggesting uterine fibroids. Pregnancy must always be excluded with a urine pregnancy test; a Pap smear and cervical cultures should be obtained to assess for cervical disease or infection. Laboratory testing should include a CBC, thyroid studies, and coagulation studies. Endometrial sampling should be performed for women age 45 or older and for women younger than 45 years of age who are at risk for endometrial hyperplasia or endometrial cancer (i.e., women with obesity or a history of chronic anovulation, failed medical therapy or persistent symptoms).For women with suspected structural abnormalities, a transvaginal ultrasound study should be pursued initially.

Management of abnormal bleeding depends on the underlying pathology identified and the degree of anemia caused by the bleeding. Hemodynamically unstable women may require uterine curettage or intravenous estrogen. For hemodynamically stable women, control of bleeding is usually achieved through the use of a combination of estrogen and progestin preparations such as oral contraceptive pills. Levonorgestrel-releasing IUDs can be used for women who have contraindications to estrogen therapy or for women who require long-term therapy. Nonsteroidal anti-inflammatory drugs (NSAIDs) can be used by women who do

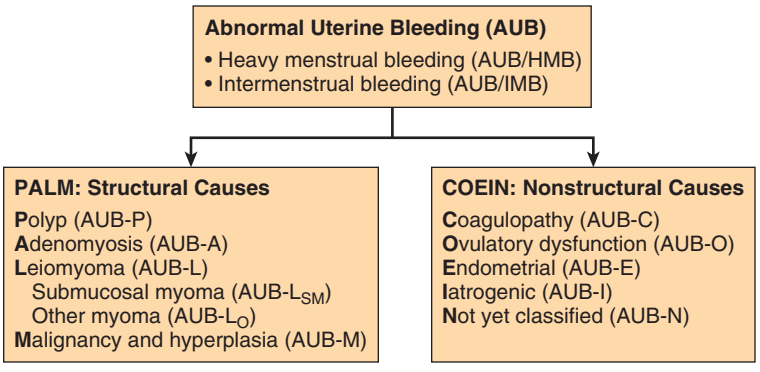

FIGURE 70-2 The PALM-COEIN classification of abnormal uterine bleeding. (From Munro MG, Critchley HO, Broder MS, Fraser IS; FIGO Working Group on Menstrual Disorders: FIGO classification system (PALM-COEIN) for causes of abnormal uterine bleeding in nongravid women of reproductive age, Int J Gynaecol Obstet 113:3–13, 2011.)