



Identification and management of eating disorders in gynecology: menstrual health as an underutilized screening tool

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Eating disorders are life-threatening conditions that disproportionately affect females, often during child-bearing years. Although the endocrinological and reproductive sequelae of these conditions often fall within the treatment purview of obstetrician-gynecologists, the assessment of eating pathology is challenging and often not part of routine clinical care. This commentary focuses on one of the common presenting symptoms of eating disorders in women, menstrual dysfunction, and discusses considerations for its clinical management in gynecology. Assessment of menstrual status provides a natural starting point for provider-patient discussion of disordered eating and weight behavior. Routine screening for eating disorders is critical and must be universal given the serious long-term consequences of these disorders.

Key words: amenorrhea, anorexia, binge eating, bulimia, menstrual dysfunction

There is substantial evidence that eating disorders (anorexia nervosa, bulimia nervosa, and binge eating disorder) often go unrecognized by health care providers. Data collected from physicians working in obstetrics and gynecology suggests that although the majority of providers assess body weight and exercise habits, less than half assess a history of eating disorders or for concerns relating to body image.¹

An assessment of specific eating disorder behaviors such as bingeing and purging are rare, with less than 10% of those surveyed indicating that such an assessment was part of their routine clinical care.¹ Thus, it is not surprising that physicians in these settings recognize

less than 1 in 10 cases of bulimia nervosa or binge eating disorder.² Low rates of eating disorder assessment represent a missed opportunity. Early identification and intervention is critical, given the cumulative negative impact of these disorders on mental and physical health. Longer latency to treatment is associated with poor prognosis,³⁻⁵ including increased mortality.⁶

Although early identification is paramount, several barriers toward recognition exist including lack of provider training, diffusion of responsibility, and patient denial of illness. In a study by Leddy et al¹ surveying Fellows of the American College of Obstetricians and Gynecologists, more than one third of physicians reported that training in diagnostic assessment of eating disorders was nonexistent during their residency; only 4% rated their training as adequate or greater. Moreover, despite the frequent neuroendocrine and reproductive sequelae of these disorders, only half of those surveyed reported that assessment of eating disorders was part of their role as providers.¹

Barriers on the provider side are compounded by the fact that most individuals with eating disorders do not seek treatment.⁷ Eating disorders,

particularly anorexia nervosa, are often ego syntonic; denial of illness and ambivalence toward treatment are common.⁸ Furthermore, patients may be reluctant to disclose their symptoms because of the shame and stigma attached to these disorders. Increasing evidence also points to poor mental health literacy as well as the social acceptability of fasting, extreme exercise, or other nonpurging weight-control methods as contributing factors.^{9,10} The frequent reticence among those with eating disorders to seek medical or psychiatric care coupled with poor mental health literacy makes improving provider training around eating disorder recognition critical.

This commentary focuses on one of the common presenting symptoms of eating disorders, menstrual dysfunction, as a starting point for provider-patient discussion and highlights the critical importance of obstetrician-gynecologists in providing collaborative care. The impact of eating disorders on pregnancy, obstetric, and perinatal outcomes has been discussed extensively elsewhere^{11,12}; therefore, the focus here is on introducing one method for eating disorder identification to provide guidelines for routine clinical management of nonpregnant women with eating disorders.

Clinical definitions

Anorexia nervosa is characterized by the restriction of food intake resulting in a significantly low body weight and an intense fear of weight gain (or persistent behavior interfering with weight gain) despite this low weight as well as a disturbance in the way in which body shape/weight are experienced. Determination of significantly low body weight is made in the context of age, sex, developmental trajectory, and physical health, though

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Diagnostic and Statistical Manual of Mental Disorders, fifth edition, provides body mass index guidelines for illness severity: ≥ 17 kg/m² (mild), 16–16.99 kg/m² (moderate), 15–15.99 kg/m² (severe), < 15 kg/m² (extreme).

Anorexia nervosa is further subtyped depending on the presence (binge eating/purging type) or absence (restricting type) of regular engagement in binge eating and/or purging behavior. Diagnostic crossover between anorexia nervosa subtypes is common.¹³ The [Table](#) presents physical symptoms commonly associated with anorexia nervosa.

Bulimia nervosa is characterized by recurrent episodes of binge eating, or uncontrolled eating of an abnormally large amount of food in a discrete time period, that is coupled with inappropriate compensatory behavior (eg, self-induced vomiting, laxatives misuse, diuretics, enemas or other medications, fasting, or excessive exercise) to prevent weight gain.¹⁴ For diagnosis, these behaviors must occur at least once per week on average; however, the frequency increases to multiple times per day in severe cases.¹⁴ Similar to anorexia nervosa, self-evaluation is unduly influenced by body shape and weight.¹⁴ Individuals with bulimia nervosa are typically average or slightly above average weight. Thus, weight is the primary symptom differentiating bulimia nervosa from binge eating/purging-type anorexia nervosa ([Table](#)).

The most prevalent eating disorder, binge eating disorder, is characterized by binge eating that occurs on average at least once per week in the absence of compensatory behavior.¹⁴ Episodes of binge eating are associated with significant distress and often feelings of disgust, shame, or embarrassment. Binge eating often occurs alone and is marked by eating more rapidly than normal, until uncomfortably full or when not physically hungry. The majority of individuals with binge eating disorder are overweight or obese, and binge eating disorder is common among those seeking weight-loss surgery. Thus, it is important to note that eating disorders occur in individuals of all weight ranges.

Menstrual disturbance: a common presenting symptom

Endocrine and physiological abnormalities including primary and secondary amenorrhea and menstrual dysfunction are commonly associated with eating disorder pathophysiology. Although no longer a requirement for diagnosis,¹⁴ approximately 90% of women with anorexia nervosa report amenorrhea, the majority of which report secondary amenorrhea.¹⁵ Although there is a clear association between reduction of body weight, nutritional status, and amenorrhea,^{16,17} some women with low body weight have normal or infrequent menses.^{15,18}

Amenorrhea also precedes weight loss in approximately 20% of women with anorexia nervosa.^{19,20} Importantly, nutritional status, not psychiatric status,

seems to be the determining factor that differentiates between women with and without amenorrhea. Studies report few meaningful differences in the course of illness, psychiatric comorbidity, eating disorder-related cognitions, or treatment outcome between menstruating and nonmenstruating patients.^{21–25} Thus, the absence of a regular menstrual cycle can be thought of as one marker of nutritional insufficiency but not pathognomonic for the disease.

Amenorrhea associated with anorexia nervosa is secondary to hypothalamic dysfunction, characterized by the suppression of gonadotrophin-releasing hormone pulsatility and subsequent estrogen deficiency.²⁰ This malnutrition-induced functional hypothalamic amenorrhea is associated with a host of other physiological changes reviewed

TABLE
Clinical characteristics and commonly associated physical symptoms of eating disorders

Eating disorder	Clinical characteristics	Commonly associated physical symptoms
Anorexia nervosa ^a	Restrictive eating May also binge eat and/or purge Underweight/emaciated	Amenorrhea Osteoporosis Bradycardia Hypotension Hypothermia Lanugo hair Dry skin, brittle nails Gastric dilation, constipation Electrolyte abnormalities Edema
Bulimia nervosa	Binge eating with purging, fasting or other compensatory behavior Normal weight	Menstrual irregularities PCOS Parotid enlargement Dental erosion Russell's sign (scarring on back of hand due to vomiting) Hypotension Edema Electrolyte abnormalities
Binge eating disorder	Binge eating in the absence of compensatory behavior Typically overweight or obese	Menstrual irregularities PCOS Medical complications associated with obesity (heart disease, diabetes, hypertension, etc)

BN, bulimia nervosa; PCOS, polycystic ovary syndrome.

^a If purging associated physical symptoms for BN also apply.

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extensively elsewhere.^{26,27} These include a sick euthyroid pattern seen in chronic starvation (low endogenous levels of triiodothyronine, whereas reverse triiodothyronine concentrations and thyroxine to triiodothyronine ratio values are elevated),^{26,28} overactivity of the hypothalamic–pituitary–adrenal axis (increased secretion of corticotrophin-releasing hormone, hypercortisolemia),²⁹ and abnormalities in appetite-regulating hormones (hypo-leptinemia, elevated peptide YY).^{30,31}

Hypo-leptinemia signaling a state of energy deficiency may mediate the neuroendocrine changes seen in hypothalamic amenorrhea.³² Eumenorrheic women with anorexia nervosa have higher serum leptin levels and more body fat compared with amenorrheic women of similar weight,²⁵ suggesting that fat mass may play a role in persevering menstrual function. Although leptin administration has been shown to normalize gonadotrophin-releasing hormone pulsatility and induce menstruation in normal-weight women,³³ there is no established threshold by which leptin levels can predict return to or cessation of menstruation.²⁵ The considerable overlap in serum leptin levels between menstruating and nonmenstruating women with anorexia nervosa²⁵ makes this unlikely and underscores the notion that leptin is likely one of many factors implicated in the pathophysiology of hypothalamic amenorrhea in women with anorexia nervosa.

Although most frequently recognized in anorexia nervosa, menstrual dysfunction is a frequent presenting symptom for women across the eating disorder diagnostic spectrum³⁴ including those with bulimia nervosa, binge eating disorder, and other specified feeding or eating disorders.¹⁵ In a study of 1705 women with eating disorders, approximately 40% of women with bulimia nervosa presented with amenorrhea and 19% reported oligomenorrhea.¹⁵

Menstrual irregularities were also common (49%) in those with other specified presentations.¹⁵ Specific eating disorder symptoms show a distinct

relationship to patterns of menstrual dysfunction. Although severe caloric restriction, excessive exercise, and low lifetime body mass index are commonly associated with the cessation of menses,¹⁵ binge eating and/or purging^{15,22} are associated with irregular or normal menstruation. Binge eating may provide sufficient, albeit irregular, caloric absorption to preserve the menstrual cycle to some extent. Conversely, a high frequency of vomiting may interfere with the menstrual cycle by increasing dopaminergic and opioid activity.^{35,36} Moreover, there is a noteworthy association between bulimia nervosa, binge eating disorder, and polycystic ovary syndrome, which itself is marked by menstrual irregularities and disruption.³⁷

Large fluctuations and dietary intake brought on by bingeing, restriction, and/or purging may facilitate the expression of morphologically polycystic ovaries, potentially mediated by abnormalities in insulin secretion.^{38,39} Ultrasonography has revealed abnormal ovarian morphology in bulimia nervosa, with greater than 75% of patients having polycystic ovaries.^{38,40} In addition, 1 of 4 women with polycystic ovary syndrome meet diagnostic criteria for binge eating disorder⁴¹ report of binge-purge eating patterns is also common.^{39,42} The exact mechanism or mechanisms linking bulimia nervosa and binge eating disorder with polycystic ovaries remain to be clarified.

Skeletal and reproductive consequences

Amenorrhea stemming from low body weight has a devastating effect on bone mineral density and has serious long-term consequences.⁴³ Eighty-five percent of women with anorexia nervosa have bone mineral density values more than 1 SD below healthy age-matched peers.^{44,45}

Early intervention is key, particularly given the frequent onset of anorexia nervosa during adolescence, which is a critical period for optimizing bone health and achieving peak bone mass. Failure to intervene early places patients at risk for potentially irreversible skeletal

damage. Women who are amenorrheic and are of low weight have an annual rate of decline in bone mineral density of -2.6% at the spine and -2.4% at the hip.⁴⁶ Risk of fracture is increased 7-fold.⁴⁷

Complications are long term with population-based retrospective cohort studies demonstrating the cumulative incidence of fracture to be 57%, with most complications occurring 2 decades after diagnosis.⁴⁸ Even though women with bulimia nervosa may also present with low bone density, research suggests that such an association is largely accounted for by a history of anorexia nervosa.⁴⁹

The high prevalence of absent or infrequent menstruation observed in eating disorders has led many to hypothesize that women with eating disorders would be unlikely to conceive. On the one hand, there is some research to support this notion. A study of 2257 women treated for anorexia nervosa at a hospital eating disorder clinic reported compromised long-term reproductive health, with a pregnancy rate for women with histories of anorexia nervosa less than half the rate of matched controls.¹² Research also consistently highlights a complex interaction between bulimia nervosa/binge eating disorder, frequent comorbid conditions of polycystic ovary syndrome and obesity, and infertility.⁵⁰ Prevalence of current or past eating disorders in patients presenting to fertility clinics is also significantly higher than the general population.⁵¹

On the other hand, 2 large population-based cohort studies suggest that a history of anorexia nervosa does not have long-term effects on fertility.^{52,53} Rates of pregnancy, reported infertility, and infertility treatment in these studies were not significantly different in women with histories of anorexia nervosa compared with the normal population.⁵³⁻⁵⁵ Similarly, Crow et al⁵⁶ found that despite high rates of menstrual dysfunction, bulimia nervosa does not seem to have an impact on a later ability to conceive.

Although research is mixed regarding the impact on long-term fertility, a heightened risk of unplanned pregnancy

is clear. Despite the high prevalence of menstrual disturbance in women with anorexia nervosa, the risk of an unplanned pregnancy is 2-fold in anorexic women compared with non-eating-disordered women.^{53,57} Women with bulimia nervosa also report a high rate of unplanned pregnancy and a greater likelihood of conceiving with oligomenorrheic menstrual status compared with quiescent bulimia nervosa controls.⁵⁸

As suggested by Bulik et al,⁵⁷ irregular or absent menstruation coupled with the belief that menstrual irregularities reduce the risk of conception may be related to reduced adherence to contraception guidelines. Impulsive personality traits including promiscuity and unprotected sex are often characteristics of bulimic spectrum disorders^{59,60} and may also contribute to an increased risk of unplanned pregnancy. Thus, it is clear that women can and do become pregnant despite the neuroendocrine sequelae of eating disorders.

Bridging menstrual status assessment with eating disorder screening

Although menstrual dysfunction is certainly not unique to or always indicative of an eating disorder, it is one symptom that indicates a need for further inquiry and can provide a starting point for discussion of dietary and weight-control habits. Indeed, the American College of Obstetricians and Gynecologists has advocated that menstrual status be considered a “vital sign” at routine clinic visits, given the potential long-term implications of menstrual dysfunction.^{61,62}

Clinical assessment should include a thorough assessment of menstrual history including, age at first menses, regularity of menses, length of flow, and number of menstrual cycles in the preceding year. However, it is also important to remember that many women with eating disorders have normal menstrual cycles and that the assessment of menstrual status may be complicated by other factors such as age, hormonal contraceptives, or the recent initiation of antidepressant treatment.⁶³ Indeed,

universal screening is critical, given the long-term, devastating impact that eating disorders have on physical and emotional health. Discussion of menstrual health is only an entry point for a discussion. Inquiry into eating and weight behaviors should occur, regardless of patient endorsement or denial of menstrual dysfunction.

Several measures have been developed to assist primary care providers in screening for eating disorders. Perhaps the most widely adopted measure, the SCOFF, is a quick 5 item screening tool for eating disorders that has been validated in a number of primary care-based studies.^{64,65} Although this measure demonstrates high specificity, it should be used with caution because more recent studies have found low levels of sensitivity, particularly in diverse samples.⁶⁶

Eating disorders occur across the age spectrum and in individuals of all racial/ethnic backgrounds.⁶⁷ Recognition of disordered eating patterns in racial/ethnic minorities is low, despite evidence that minorities are equally or more likely to suffer from eating disorders, particularly bulimia nervosa and binge eating disorder.⁶⁸ This, coupled with recent revisions to the criteria such that binge eating disorder is no longer a provisional diagnosis, suggests that a substantial number of individuals with eating disorders may be missed. Thus, providers should not solely rely on the SCOFF and must directly ask all patients about their exercise and dietary habits, including a history of bingeing and purging, weight loss or gain, and recent psychosocial stressors.

The Bulimic Investigatory Test, Edinburgh⁶⁹ and the Eating Disorder Examination-Questionnaire⁷⁰ are 2 examples of reliable and valid self-report measures that can be given in the waiting room prior to the appointment and quickly reviewed by a clinician to provide another starting point for in-person assessment. Because early diagnosis and multidisciplinary treatment results in better outcomes, it is important to recognize that the report of any disordered eating behavior requires treatment, even if a woman denies or

minimizes its significance. Open and ongoing communication is key to the identification and prevention of possible gynecological or obstetric complications.

Providing collaborative care

The primary intervention for obstetrician-gynecologists following a positive screen should be to refer to a multidisciplinary eating disorder treatment team that can address both the physical and psychiatric aspects of the illness. This typically includes a clinical psychologist and psychiatrist with experience in eating disorders treatment, a dietitian, and a primary care physician but also may include social workers and occupational therapists. However, it is essential that involvement does not end with referral.

All providers must present a clear and consistent message; specific goals for obstetrician-gynecologists working with these women should reflect the overall goals of eating disorder treatment. Thus, although the return of regular menstruation is a crucial goal for obstetrician-gynecologists working with women with eating disorders, it is critical to understand that treatment must focus on improved nutritional status and weight recovery instead of estrogen replacement.

Improved nutrition is the single most important factor in regaining bone health.⁷¹ In women who fully regain weight and recover their menses, an annual rate of increase in bone mineral density is 1.8% at the hip and 3.1% of the posterior anterior spine.⁴⁷ Estrogen therapy in the form of hormonal replacement therapy or as oral contraceptives in an effort to reduce or ameliorate osteopenia or osteoporosis, on the other hand, is largely unsuccessful.⁷²

Numerous studies demonstrate that estrogen therapy is of no benefit in preserving bone mineral density,⁷²⁻⁷⁵ whereas other studies caution that oral contraceptives in the absence of weight gain results in continued bone loss.⁴⁷ However, despite this research 75–80% of practitioners caring for females with anorexia nervosa report prescribing

supplemental estrogen to prevent bone loss.^{72,74} This practice may have unintended and detrimental consequences. Prescribing oral contraceptives removes one of the main indicators of normal-weight attainment for adolescent girls and premenopausal women. Moreover, some researchers have suggested that regular menstrual cycles induced by oral contraceptives can create a false sense of health, reducing motivation for recovery and adherence to a treatment aimed at weight restoration.^{76,77}

Oral contraceptive use among women with anorexia nervosa has also been associated with increased cardiovascular risk markers, including high-sensitivity C-reactive protein compared with women with anorexia nervosa not receiving such treatment.⁷⁸ Taken together, this research suggests that oral contraceptives should not be prescribed to non—sexually active women with low-weight eating disorders and that the best intervention to prevent or reverse bone loss is weight restoration.

The potential negative consequences of prescribing oral contraceptives in women of child-bearing age must also be balanced with the risk of unplanned pregnancy. Educating sexually active women of the risks of becoming pregnant despite menstrual irregularities is an important clinical intervention. Unplanned pregnancies may decrease the opportunity to establish critical nutritional and psychiatric support necessary to mitigate the adverse perinatal outcomes associated with eating disorders.^{11,12,79} Obstetrician-gynecologists working with eating disorder populations should emphasize that prescription of birth control pills is only to prevent pregnancy and that induced menstruation does not protect against the negative impact that low body weight and/or inconsistent (or absent) nutrition have on physical and emotional health.

Irregular or absent menstruation associated with polycystic ovary syndrome in eating disorders also presents a unique challenge for obstetrician-gynecologists. Although prescription of lifestyle management (eg, weight loss, dietary modification, physical activity) strategies is often a first-line treatment

for polycystic ovary syndrome,⁸⁰ and this approach may be contraindicated in individuals with eating disorders.

Focus on diet and exercise in the absence of concurrent psychiatric treatment may exacerbate the cyclical patterns of bingeing, restriction, and purging. Prescription of weight loss in this population should be avoided. Importantly, some research suggests that despite persistence during the early stages of bulimia nervosa recovery, polycystic morphology may resolve when normal eating patterns are maintained long term.⁴⁰ Thus, the available research suggests that first-line treatments of bulimia nervosa or binge eating disorder such as enhanced cognitive behavioral therapy should precede other interventions. Enhanced cognitive behavioral therapy has strong empirical support in the treatment of bulimia nervosa and binge eating disorder, with two thirds of treatment completers reporting symptom remission.^{81,82}

Finally, women seeking to become pregnant should be encouraged to address maladaptive eating behaviors prior to trying to conceive, given the increased risk of negative birth outcomes (eg, greater risk of perinatal mortality, increase risk of preterm birth, very low Apgar scores), heightened risk of postpartum depression, and likelihood of relapse following delivery (see Bulik and colleagues⁸³ for review).

Summary and conclusion

Women with eating disorders represent a unique challenge for obstetricians and gynecologists. Nevertheless, given the endocrine and reproductive sequelae of these disorders, eating disorder screening must fall within the treatment domain of obstetrician-gynecologists. Assessment of menstrual status can serve as bridge (or reminder) to prompt further inquiry into eating and weight behaviors. Menstrual dysfunction, although common, is not ubiquitous to eating disorders and is only one of many symptoms requiring attention if detected. Failure to identify disordered eating patterns places women at risk for serious long-term skeletal and reproductive consequences as well as a myriad of other

negative health complications. Eating disorder screening must be universal. ■

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