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Committee on Adolescent Health Care

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Menstruation in Girls and Adolescents: Using the Menstrual Cycle as a Vital Sign

ABSTRACT: Despite variations worldwide and within the U.S. population, median age at menarche has remained relatively stable—between 12 years and 13 years—across well-nourished populations in developed countries. Environmental factors, including socioeconomic conditions, nutrition, and access to preventive health care, may influence the timing and progression of puberty. A number of medical conditions can cause abnormal uterine bleeding, characterized by unpredictable timing and variable amount of flow. Clinicians should educate girls and their caretakers (eg, parents or guardians) about what to expect of a first menstrual period and the range for normal cycle length of subsequent menses. Identification of abnormal menstrual patterns in adolescence may improve early identification of potential health concerns for adulthood. It is important for clinicians to have an understanding of the menstrual patterns of adolescent girls, the ability to differentiate between normal and abnormal menstruation, and the skill to know how to evaluate the adolescent girl patient. By including an evaluation of the menstrual cycle as an additional vital sign, clinicians reinforce its importance in assessing overall health status for patients and caretakers.

Conclusions and Recommendations

Based on the following information, the American College of Obstetricians and Gynecologists provides these conclusions and recommendations:

- Clinicians should educate girls and their caretakers (eg, parents or guardians) about what to expect of a first menstrual period and the range for normal cycle length of subsequent menses.
- Once girls begin menstruating, clinicians should ask at every preventive care or comprehensive visit for the patient's first day of her last menstrual period and the pattern of menses.
- Identification of abnormal menstrual patterns in adolescence may improve early identification of potential health concerns for adulthood.
- It is important for clinicians to have an understanding of the menstrual patterns of adolescent girls, the ability to differentiate between normal and abnormal menstruation, and the skill to know how to evaluate the adolescent girl patient.

Background

Young girls and their caretakers (eg, parents or guardians) frequently have difficulty assessing what constitutes normal menstrual cycles or patterns of bleeding. Patients and their caretakers may be unfamiliar with what is normal and patients may not inform their caretakers about menstrual irregularities or missed menses. In addition, a patient is often reluctant to discuss this topic with a caretaker, although the patient may confide in another trusted adult. Some adolescent girls may seek medical attention for cycle variations that actually fall within the normal range or may be unaware that their bleeding patterns are abnormal and may be attributable to significant underlying medical issues with the potential for long-term health consequences.

Clinicians also may be unsure about normal ranges for menstrual cycle length and the amount of menstrual bleeding during adolescence. Clinicians who are confident in their understanding of early menstrual bleeding patterns will be able to convey information to their patients more frequently and with less prompting; girls

who have been educated about menarche and early menstrual patterns will experience less anxiety when they occur (1). By including an evaluation of the menstrual cycle as an additional vital sign, clinicians reinforce its importance in assessing overall health status for patients and caretakers. Just as abnormal blood pressure, heart rate, or respiratory rate may be key to diagnosing potentially serious health conditions, identification of abnormal menstrual patterns in adolescence may improve early identification of potential health concerns for adulthood.

Normal Menstrual Cycles

Menarche

Despite variations worldwide and within the U.S. population, median age at menarche has remained relatively stable—between 12 years and 13 years—across well-nourished populations in developed countries (see [Box 1](#)) (2, 3). The U.S. National Health and Nutrition Examination Surveys have found no significant change in the median age at menarche over the past 30 years, except among the non-Hispanic black population which has a 5.5-month earlier median age at menarche than it did 30 years ago (2). Studies have shown that a higher gain in body mass index during childhood is related to an earlier onset of puberty (4, 5) that may result from attainment of a minimal requisite body mass index at a younger age. Environmental factors, including socioeconomic conditions, nutrition, and access to preventive health care, may influence the timing and progression of puberty (6).

Menarche typically occurs within 2–3 years after thelarche (breast budding), at Tanner stage IV breast development, and is rare before Tanner stage III development (7). By age 15 years, 98% of females will have had menarche (2). An evaluation for primary amenorrhea should be considered for any adolescent who has not reached menarche by age 15 years or has not done so within 3 years of thelarche. Lack of breast development by age 13 years also should be evaluated (8).

Cycle Length and Ovulation

Menstrual cycles are often irregular during adolescence, particularly the interval from the first cycle to the second cycle. Most females bleed for 2–7 days during their first menses (9, 10). Immaturity of the hypothalamic-

pituitary-ovarian axis during the early years after menarche often results in anovulation and cycles may be somewhat long; however, 90% of cycles will be within the range of 21–45 days (11), although short cycles of less than 20 days and long cycles of more than 45 days may occur. By the third year after menarche, 60–80% of menstrual cycles are 21–34 days long, as is typical of adults (10–12).

Abnormal Uterine Bleeding

A number of medical conditions can cause abnormal uterine bleeding, characterized by unpredictable timing and variable amount of flow. Although a long interval between cycles is common in adolescence due to anovulation, it is statistically uncommon for girls and adolescents to remain amenorrheic for more than 3 months or 90 days (the 95th percentile for cycle length). Girls and adolescents with more than 3 months between periods should be evaluated. Although experts typically report that the mean blood loss per menstrual period is 30 mL per cycle and that chronic loss of more than 80 mL is associated with anemia, this has limited clinical use because most females are unable to measure their blood loss. Menstrual flow requiring changes of menstrual products every 1–2 hours is considered excessive, particularly when associated with flow that lasts more than 7 days at a time.

Abnormal uterine bleeding may be caused by ovulatory dysfunction, and bleeding patterns can range from amenorrhea to irregular heavy menstrual bleeding. Although ovulatory dysfunction is somewhat physiologic the first few years after menarche, it can be associated with endocrinopathies due to hypothalamic-pituitary-ovarian axis disturbances, such as polycystic ovary syndrome and thyroid disease, as well as mental stress and eating disorders (13, 14). Heavy menstrual bleeding, commonly associated with anovulation, also has been associated with the diagnosis of a coagulopathy (including von Willebrand's disease, platelet function disorders, and other bleeding disorders) or other serious problems (including hepatic failure) and, rarely, malignancy (15–19). See [Box 2](#) for a list of potential causes of abnormal uterine bleeding in adolescents. The diagnosis of pregnancy, sexual trauma, and sexually transmitted infections should be excluded, even if the history suggests the patient has not been sexually active.

Anticipatory Guidance

Clinicians should include pubertal development in their anticipatory guidance to children and caretakers beginning at the 7 year and 8 year visits (20). Clinicians should take an ongoing history and perform a complete annual examination, including the inspection of the external genitalia. It is important to educate girls and their caretakers about the usual progression of puberty and development of the menstrual cycle. Clinicians should convey that females will likely begin to menstruate approximately 2–3 years after breast development begins. Adolescent

Box 1. Normal Menstrual Cycles in Adolescent Girls ←

Menarche (median age):	12.43 years
Mean cycle interval:	32.2 days in first gynecologic year
Menstrual cycle interval:	Typically 21–45 days
Menstrual flow length:	7 days or less
Menstrual product use:	Three to six pads or tampons per day

Box 2. Causes of Abnormal Uterine Bleeding in Adolescent Girls ↩

- Pregnancy
- Immaturity of the hypothalamic–pituitary–ovarian axis
- Hyperandrogenic anovulation (eg, polycystic ovary syndrome, congenital adrenal hyperplasia, or androgen-producing tumors)*
- Coagulopathy (eg, von Willebrand disease, platelet function disorders, other bleeding disorders, or hepatic failure)†
- Hypothalamic dysfunction (eg, eating disorders [obesity, underweight, or significant fast weight loss] or stress-related hypothalamic dysfunction)
- Hyperprolactinemia
- Thyroid disease
- Primary pituitary disease
- Primary ovarian insufficiency‡
- Iatrogenic (eg, secondary to radiation or chemotherapy)
- Medications (eg, hormonal contraception or anticoagulation therapy)
- Sexually transmitted infections (eg, cervicitis)
- Malignancy (eg, estrogen-producing ovarian tumors, androgen-producing tumors, or rhabdomyosarcoma)
- Uterine lesions

*See Polycystic ovary syndrome. ACOG Practice Bulletin No. 108. American College of Obstetricians and Gynecologists. *Obstet Gynecol* 2009;114:936–49 (<http://www.acog.org/-/media/Practice-Bulletins/Committee-on-Practice-Bulletins----Gynecology/pb108.pdf?dmc=1&ts=20150918T1543541376>) and Management of adnexal masses. ACOG Practice Bulletin No. 83. American College of Obstetricians and Gynecologists. *Obstet Gynecol* 2007;110:201–14 (<http://www.acog.org/-/media/Practice-Bulletins/Committee-on-Practice-Bulletins----Gynecology/pb083.pdf?dmc=1&ts=20150918T1547432631>).

†See Von Willebrand disease in women. Committee Opinion No. 580. American College of Obstetricians and Gynecologists. *Obstet Gynecol* 2013;122:1368–73 (<http://www.acog.org/-/media/Committee-Opinions/Committee-on-Adolescent-Health-Care/co580.pdf?dmc=1&ts=20150918T1548433882>).

‡See Primary ovarian insufficiency in adolescents and young women. Committee Opinion No. 605. American College of Obstetricians and Gynecologists. *Obstet Gynecol* 2014;123:193–7 (<http://www.acog.org/-/media/Committee-Opinions/Committee-on-Adolescent-Health-Care/co605.pdf?dmc=1&ts=20150918T1549212476>).

girls should understand that menstruation is a normal part of development and should be instructed on the use of feminine products and on what is considered normal menstrual flow. It is preferred that caretakers and clinicians participate in this educational process.

Evaluation

Preventive health visits should begin during adolescence to start a dialogue and establish an environment where

a patient can feel good about taking responsibility for her own reproductive health and feel confident that her concerns will be addressed in a confidential setting (20, 21). Because menarche is such an important milestone in physical development, clinicians should educate adolescent girls and their caretakers about what to expect of a first menstrual period and the range for normal cycle length of subsequent menses. Once adolescent girls begin menstruating, clinicians should ask at every preventive care or comprehensive visit for the patient's first day of her last menstrual period and the pattern of menses. By including this information with the other vital signs within the Review of Systems and History of Present Illness, clinicians emphasize the important role of menstrual patterns in reflecting overall health status.

Asking the patient to chart her menses may be beneficial, especially if her menstrual history is too vague or considered to be inaccurate. The importance of accurate charting should be emphasized and the patient should be educated about what would be considered an abnormal menstrual cycle. Clinicians should explain that cycle length is counted from the first day of a menstrual period to the first day of the next menses and may vary by cycle because this often leads to miscommunication between patients and clinicians. Use of technology can facilitate charting; there are a number of easy to use smart phones applications designed for this purpose.

It is important for clinicians to have an understanding of the menstrual patterns of adolescent girls, the ability to differentiate between normal and abnormal menstruation, and the skill to know how to evaluate the adolescent girl patient. Menstrual abnormalities that suggest the need for further evaluation are listed in Box 3.

Box 3. Menstrual Abnormalities That May Require Evaluation ↩

Menstrual periods that

- have not started within 3 years of thelarche
- have not started by 14 years of age with signs of hirsutism
- have not started by 14 years of age with a history or examination suggestive of excessive exercise or eating disorder
- have not started by 15 years of age
- occur more frequently than every 21 days or less frequently than every 45 days
- occur 90 days apart even for one cycle
- last more than 7 days
- require frequent pad or tampon changes (soaking more than one every 1–2 hours)
- are heavy and are associated with a history of excessive bruising or bleeding or a family history of a bleeding disorder

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