# ABNORMAL UTERINE BLEEDING DURING ADOLESCENCE: **REASSURING STRATEGIES**

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OBSTETRICS AND GYNECOLOGY/REPRODUCTIVE ENDOCRINOLOGY AND INFERTILITY

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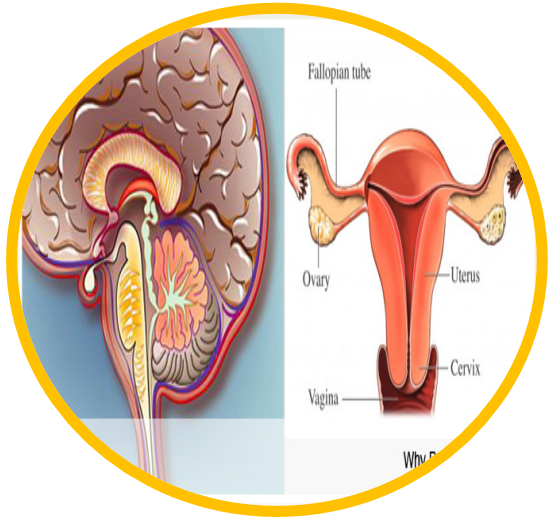
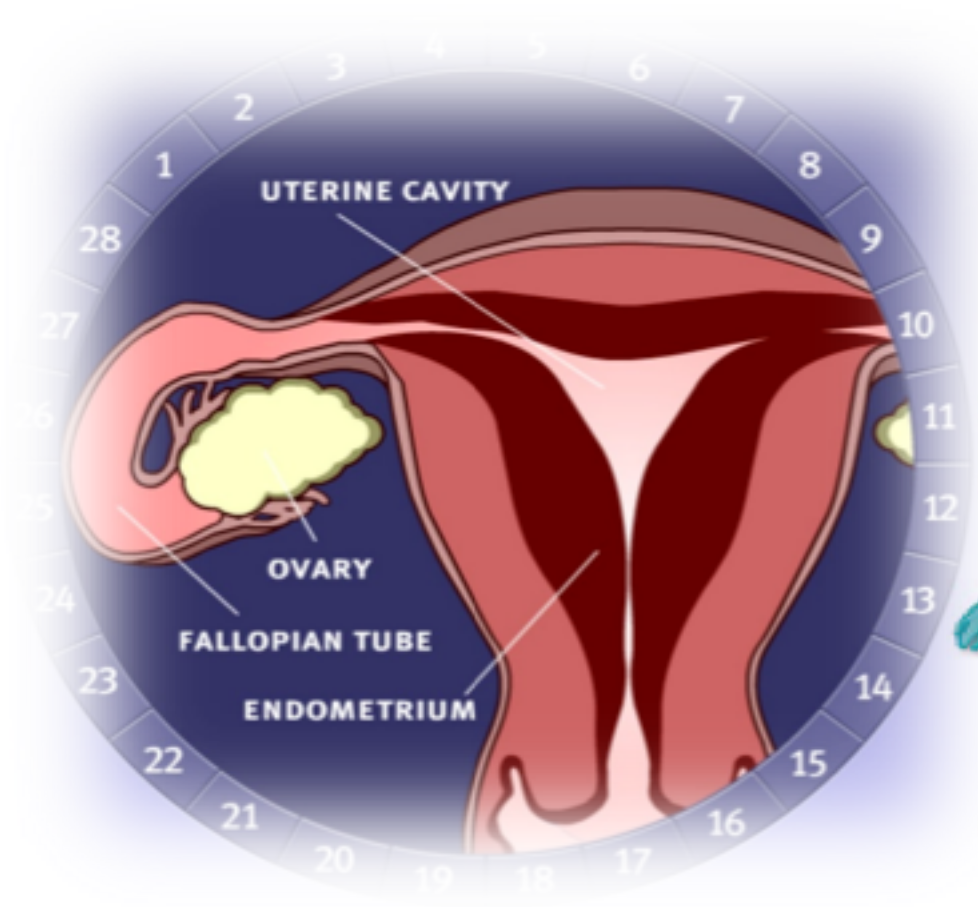
# OUTLINE




Pathophysiology and symptoms

Evaluation

Treatment




# NORMAL MENSTRUAL CYCLE OF ADOLESCENTS

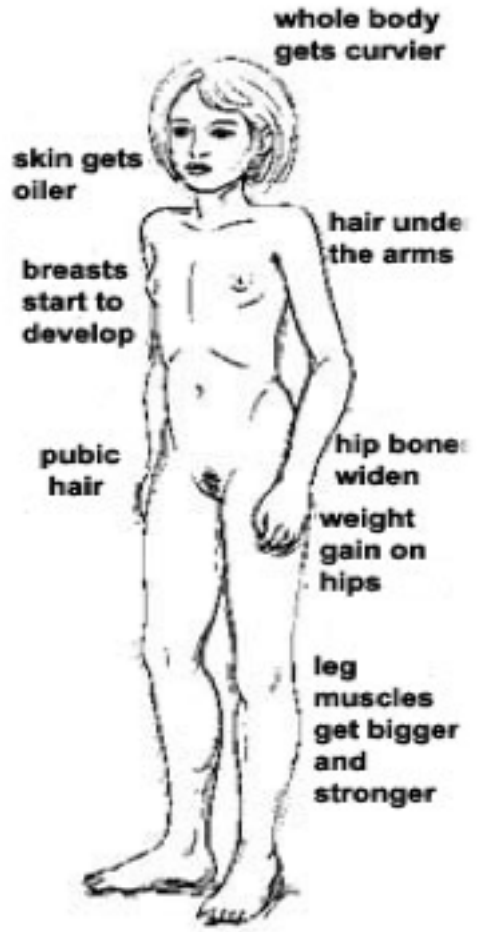
# NORMAL MENSTRUAL CYCLE OF ADOLESCENTS

- 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


Bennett AR and Gray SH. What to do when she's bleeding through the recognition, evaluation, and management of AUB in adolescents. Curr Opin Pediatr 2014, 26:413–419

# NORMAL MENSTRUAL CYCLE OF ADOLESCENTS

- The normal menstrual cycle of an adolescent female occurs every **21–45 days** (mean cycle length 32.2 days) and lasts between **3 and 7 days**.
- A normal menstrual period involves the loss of **30–40ml** of blood per cycle (3–6 pads or tampons per day or 10–15 soaked pads or tampons per cycle)

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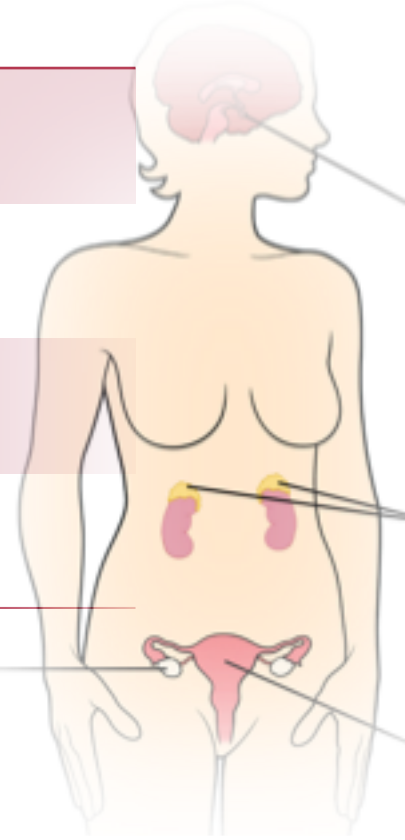
# NORMAL MENSTRUAL CYCLES IN ADOLESCENT GIRLS

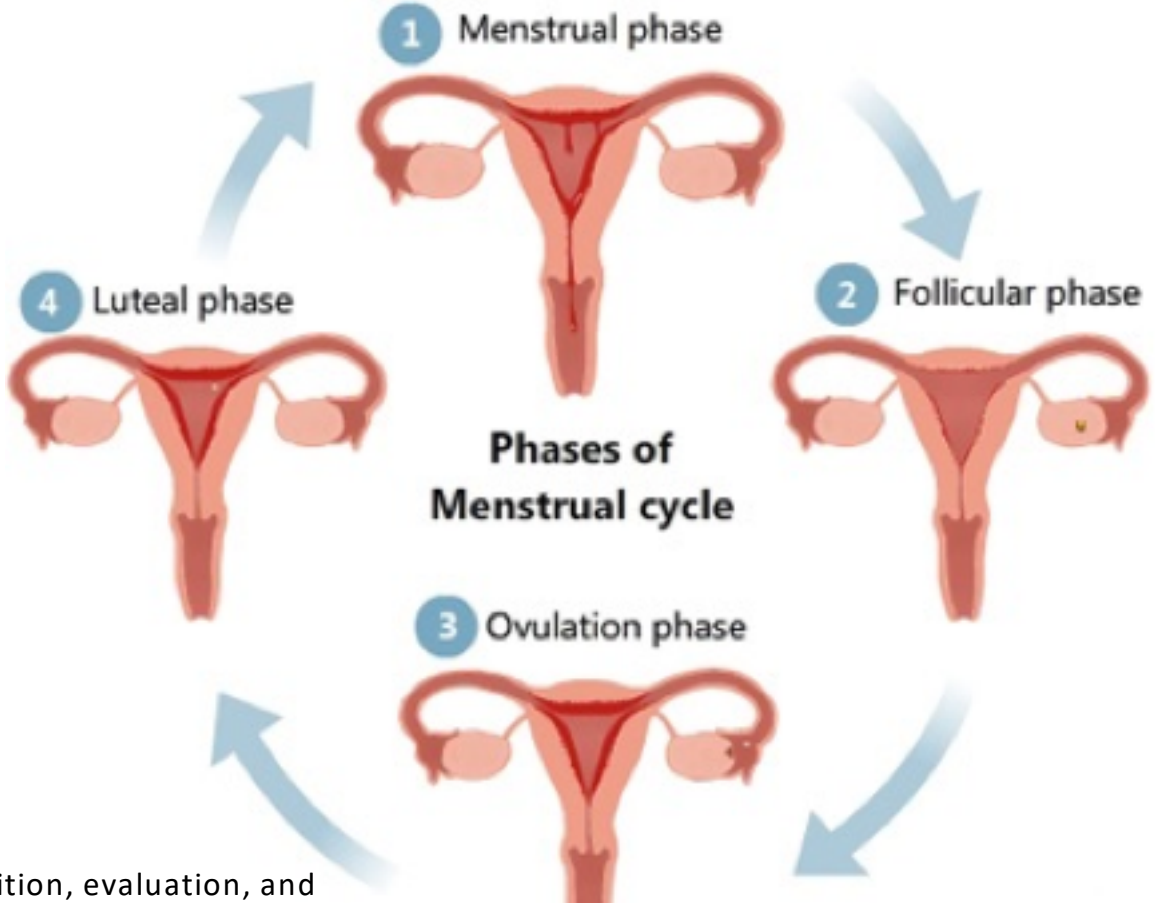
| | |
|---|---|
| **Menarche (median age)** | 12.43 years |
| **Mean cycle interval** | 32.2 days in first gynecologic year |
| **Menstrual cycle interval** | Typically 21-45 days |
| **Menstrual flow length** | 7 days or less |
| **Menstrual product use** | 3-6 pads/ tampons per day |




*Menstruation in girls and adolescents: using the menstrual cycle as a vital sign*. Committee Opinion No. 651. American College of Obstetricians and Gynecologists. Obstet Gynecol 2015;126:e143–6

# PATHOPHYSIOLOGY

- 55-82% of adolescents take up to **24 months** after menarche before having regular ovulatory cycles
- Having an occasional ovulatory cycle stabilizes endometrial growth and allows for complete shedding

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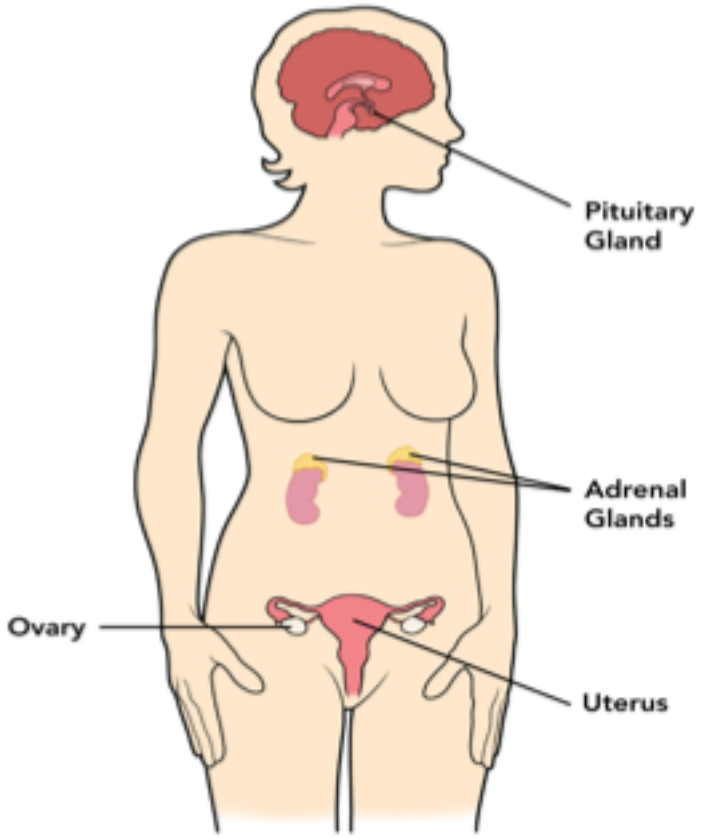
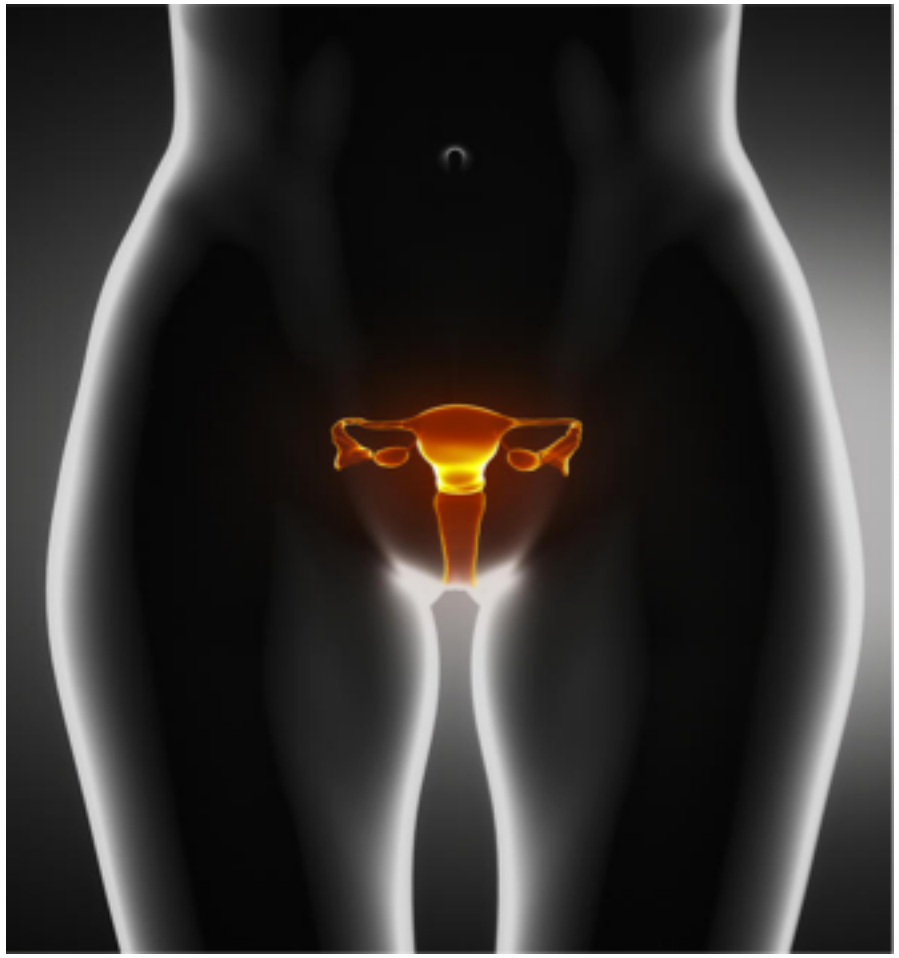
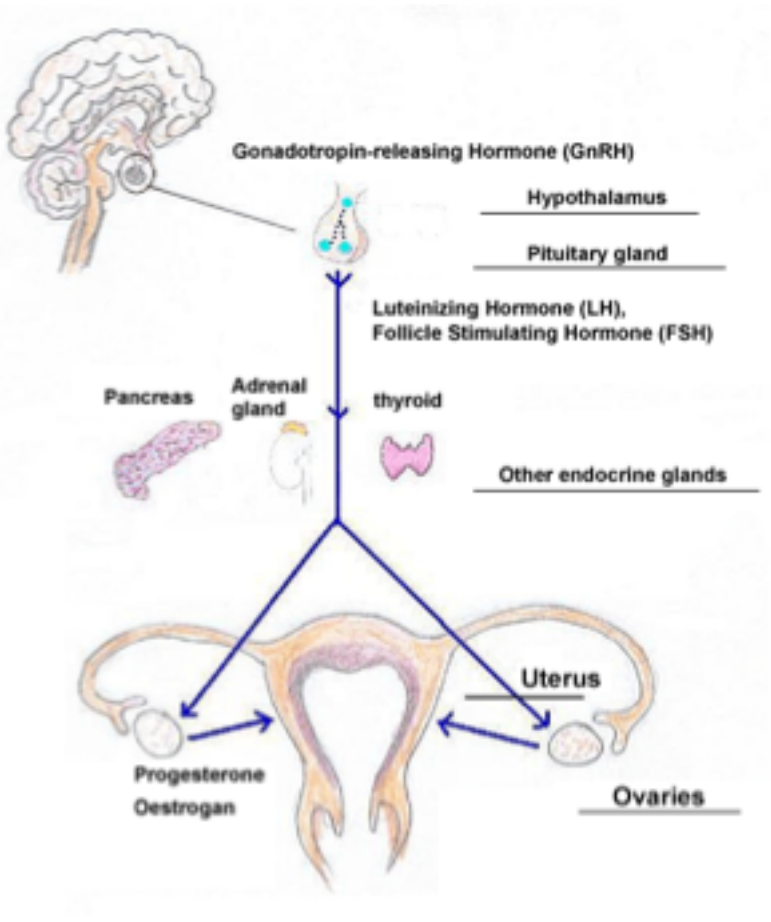
# PATHOPHYSIOLOGY

- World Health Organization (WHO) study:
  - 19% of girls had regular cycles within the first three cycles
  - 67% had regular cycles by the end of 2 years.


World Health Organization Task Force on Adolescent Reproductive Health. World Health Organization multicenter study on menstrual and ovulatory patterns in adolescent girls. J Adolesc Health 1986;7:236-244.



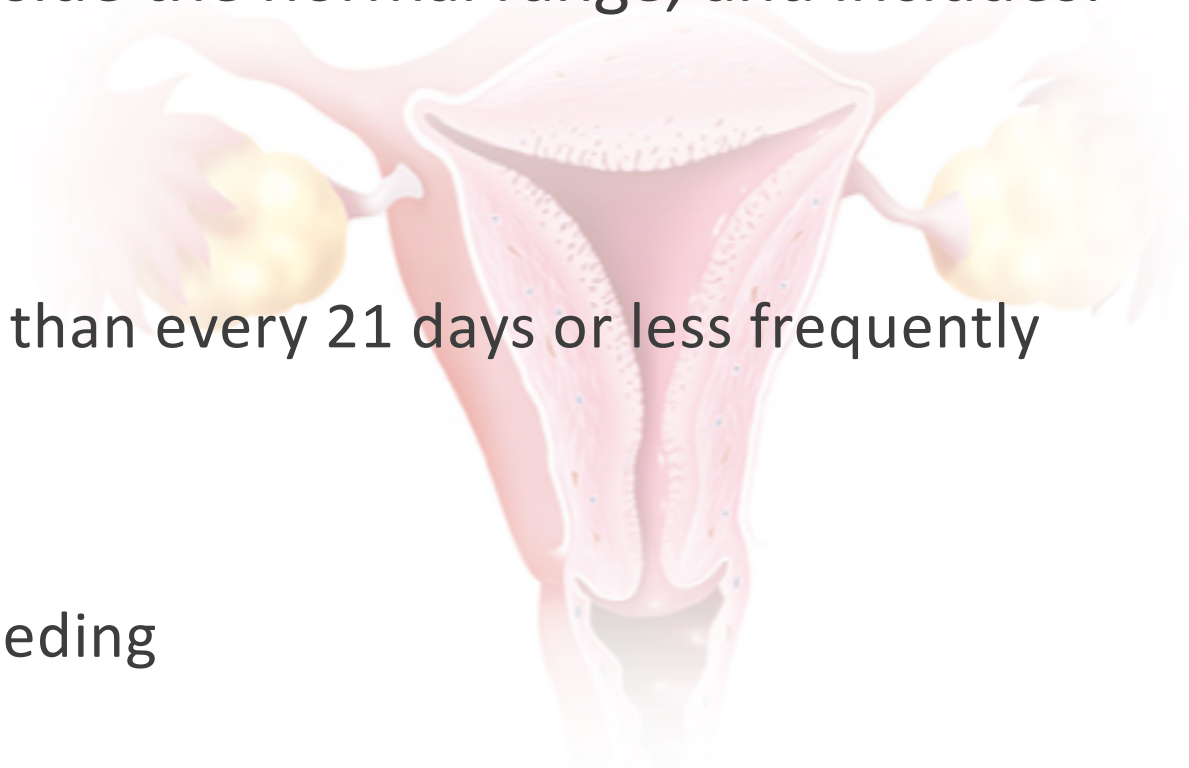






# PATHOPHYSIOLOGY

# ABNORMAL UTERINE BLEEDING

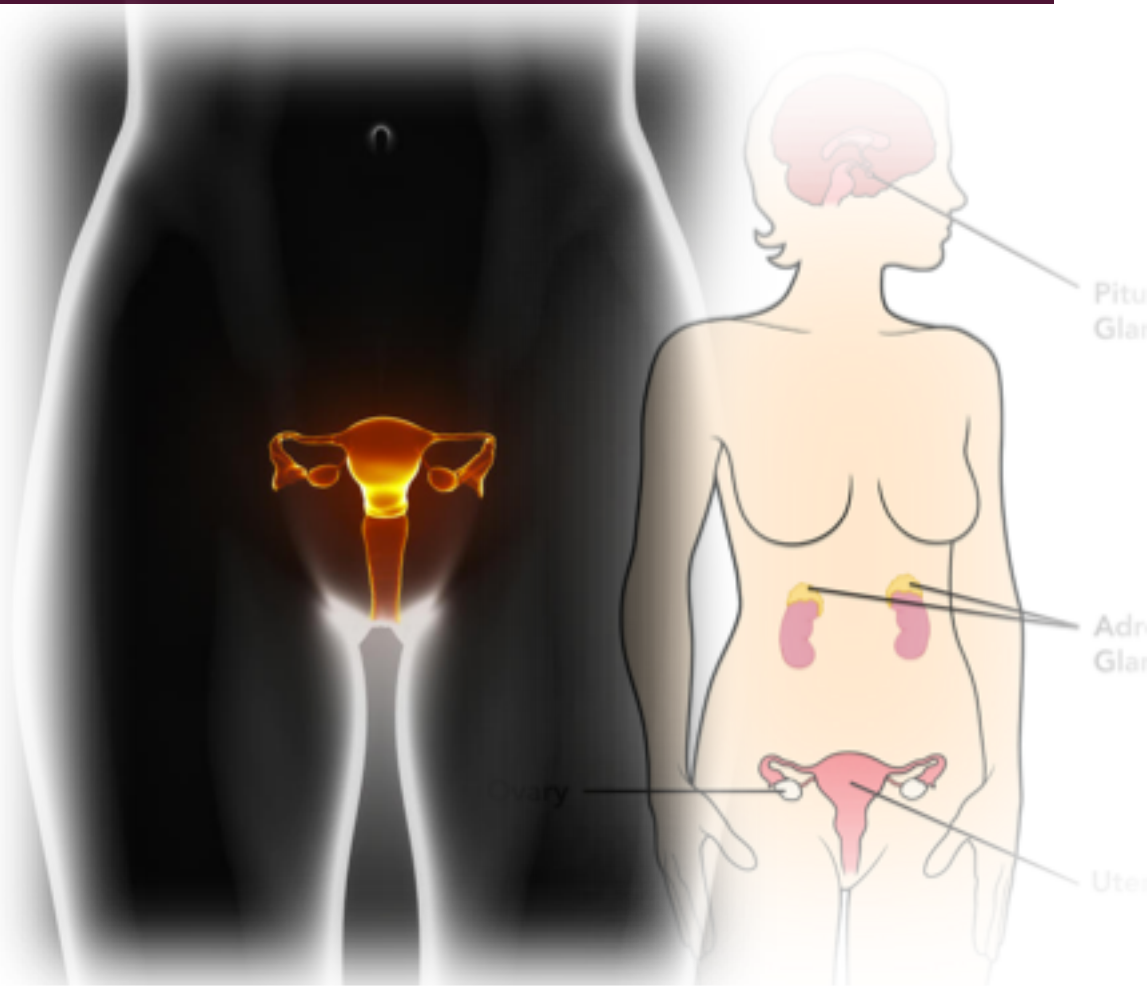
- Menstrual bleeding that occurs outside the normal range, and includes:
  - Absence of menses (amenorrhea)
  - Menses at irregular intervals
  - Menstrual periods more frequently than every 21 days or less frequently than every 45 days
  - Excessive menstrual flow
  - Intermenstrual or breakthrough bleeding



De Silva N. Abnormal uterine bleeding in adolescents: Evaluation and approach to diagnosis. August 2016. www.uptodate.com

# PATHOPHYSIOLOGY

- AUB is a common adolescent complaint and is often due to *anovulatory cycles.*



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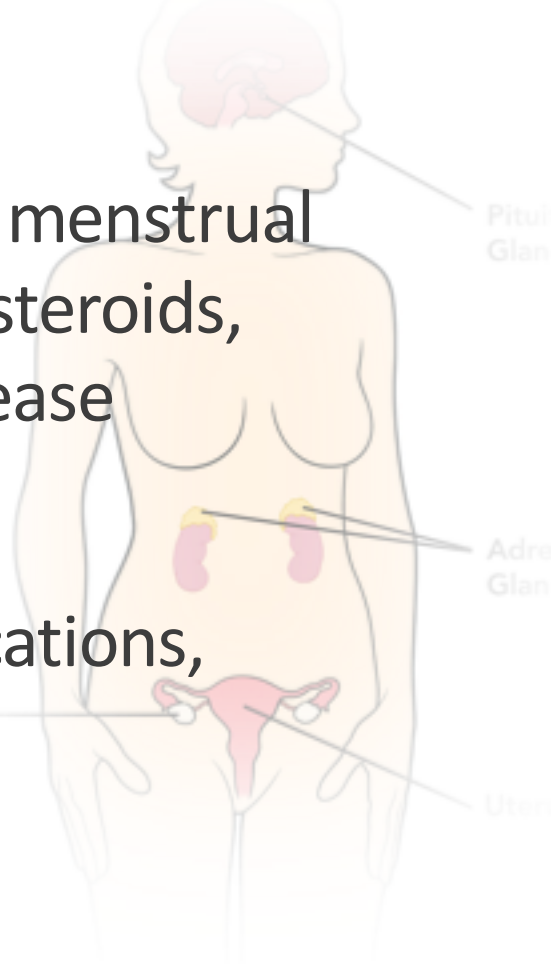
# WHAT IS ANOVULATORY BLEEDING?

- **Anovulatory uterine bleeding** refers to excessive, noncyclic menstrual blood flow that results from anovulatory production of sex steroids, unrelated to structural lesions of the uterus or systemic disease
- Immaturity of the HPO axis is the most common cause
- Other causes include systemic illness and neoplasms, medications, sudden weight loss, and intense exercise



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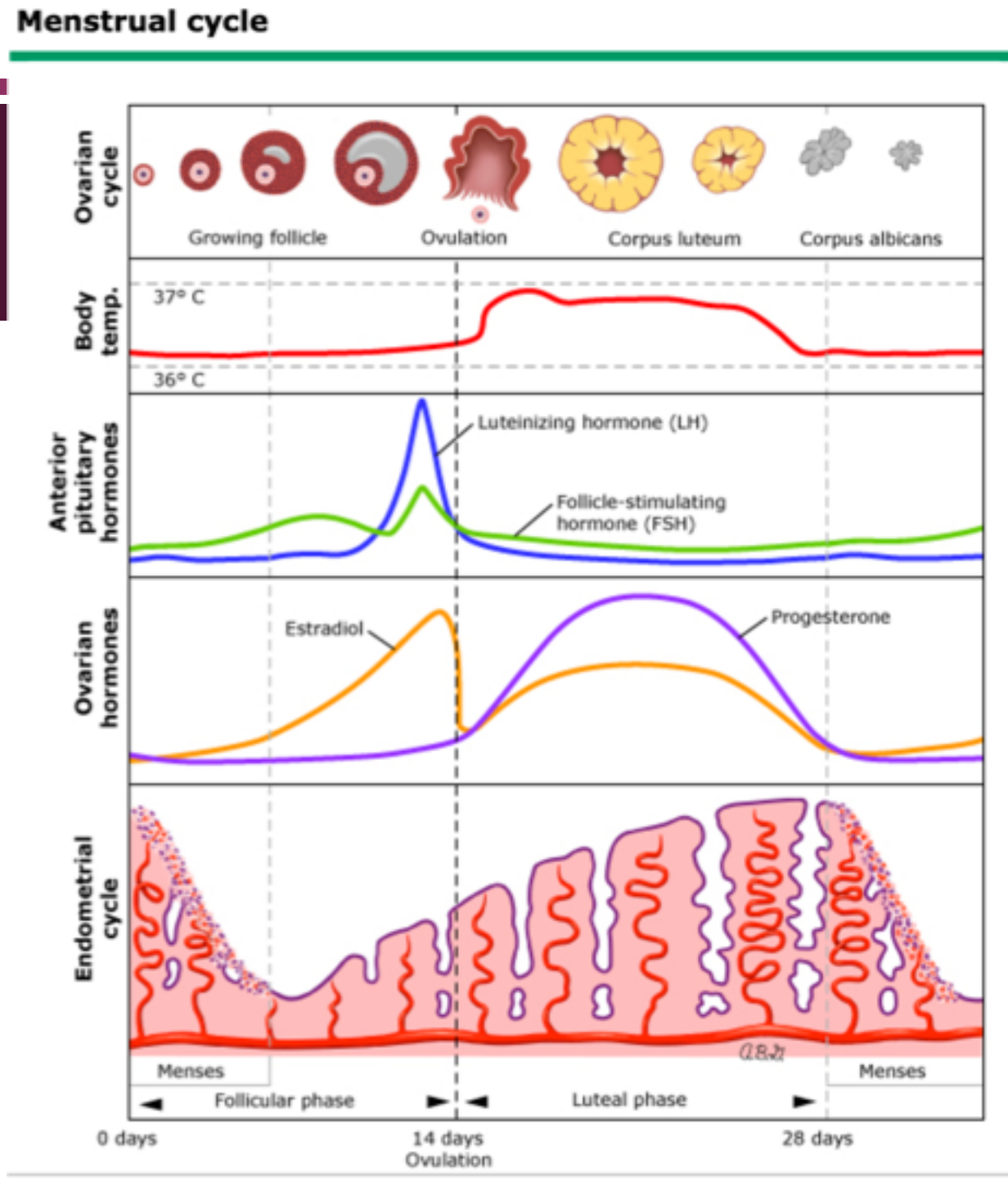
# PATHOPHYSIOLOGY

- First two years after menarche: adolescent girls have anovulatory cycles → EM lacks the stabilizing effect of progesterone.
- the EM becomes thickened → breaks down and sloughs when estrogen is withdrawn or when it becomes unstable

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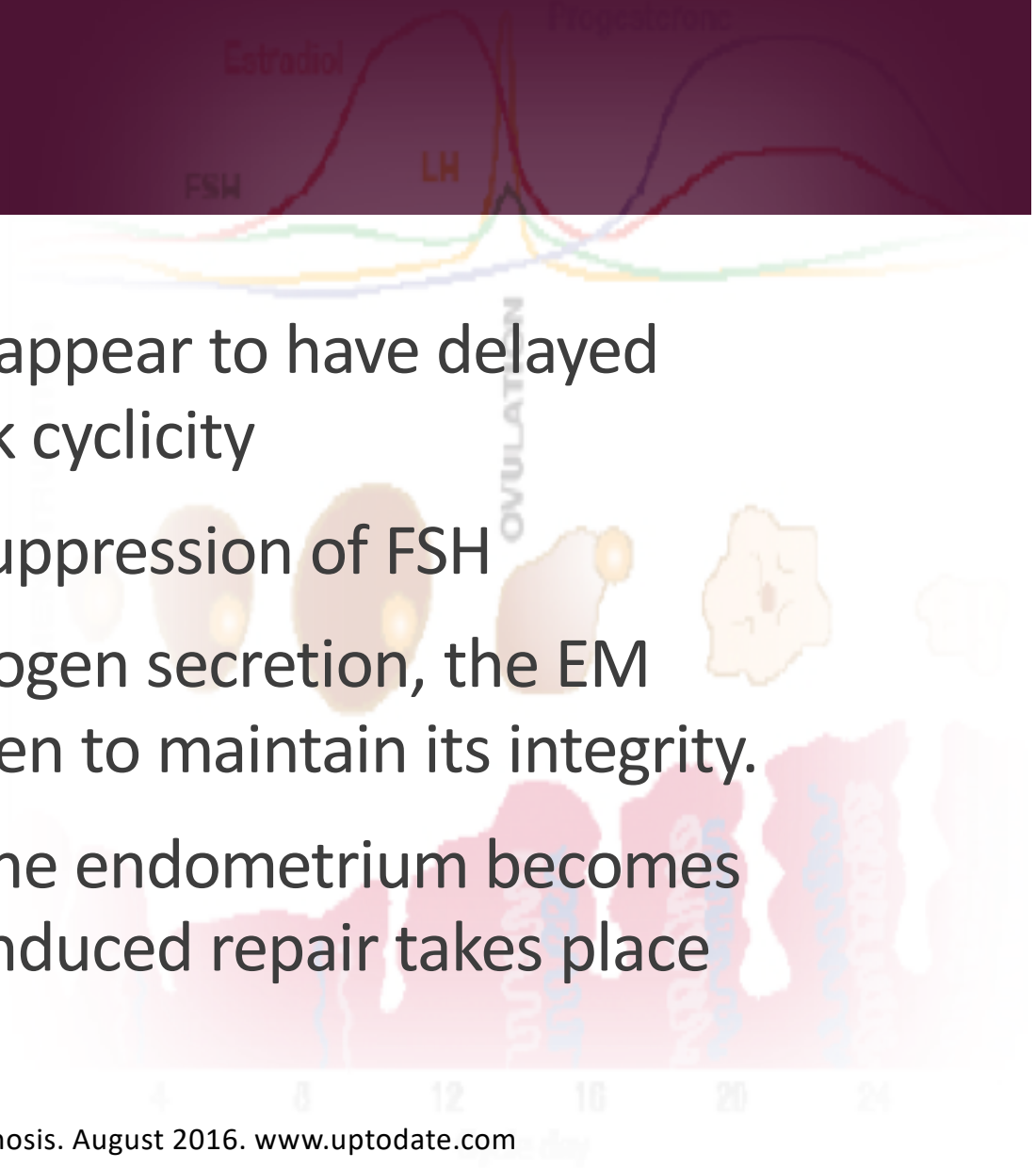
# PATHOPHYSIOLOGY




- Adolescents with anovulatory bleeding appear to have delayed maturation of normal negative feedback cyclicity
- Rising levels of estrogen do not cause suppression of FSH
- In these girls with sustained acyclic estrogen secretion, the EM proliferates beyond the ability of estrogen to maintain its integrity.
- Irregular, heavy bleeding occurs when the endometrium becomes unstable and continues until estrogen-induced repair takes place

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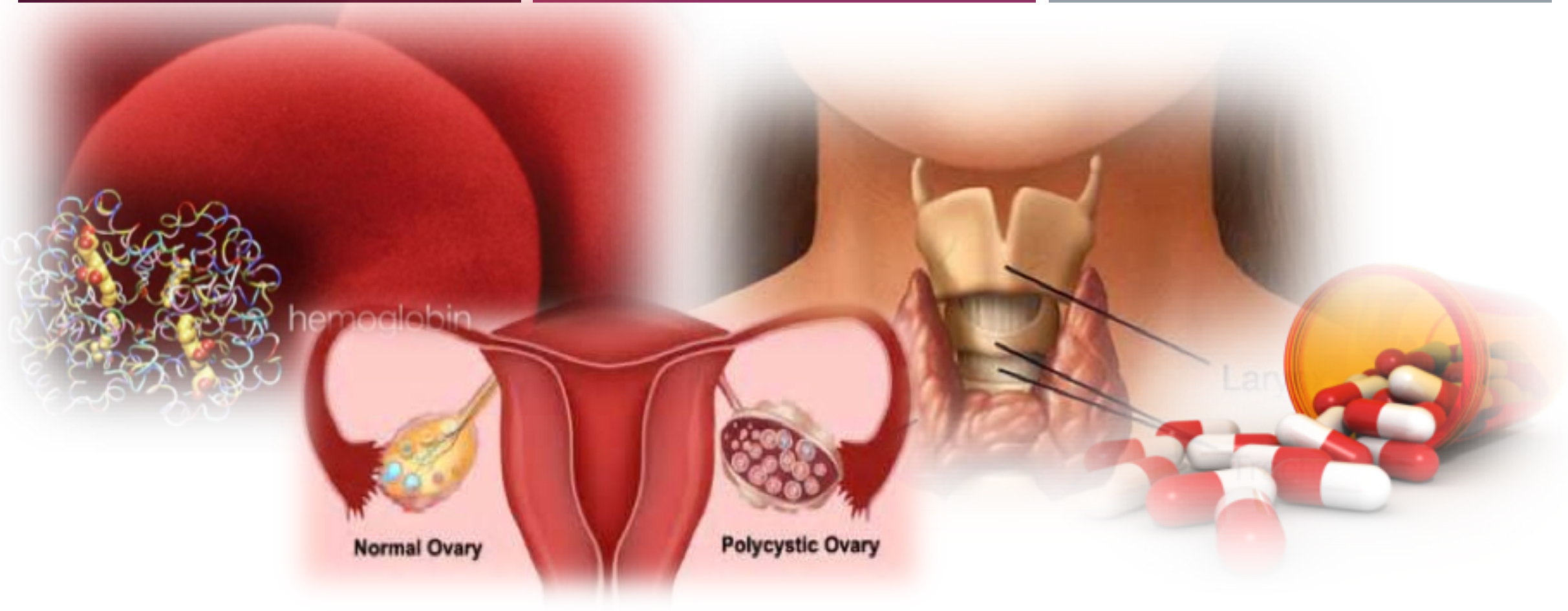



# DIFFERENTIAL DIAGNOSIS

# CAUSES OF AUB IN ADOLESCENT GIRLS

| | |
|---|---|
| • Pregnancy | • Primary Pituitary disease |
| • Immaturity of the HPO axis | • Primary ovarian insufficiency |
| • Hyperandrogenic anovulation (e.g. PCOS, CAH, androgen-producing tumors) | • Iatrogenic (e.g. secondary to radiation or chemotherapy) |
| • Coagulopathy (e.g. von Willebrand disease, platelet function disorders, other bleeding disorders, or hepatic failure) | • Medications (e.g. anticoagulation therapy) |
| • Hypothalamic dysfunction (e.g. eating disorders [obesity, underweight, or significant fast weight loss] or stress-related hypothalamic dysfunction) | • Sexually transmitted disease (e.g cervicitis) |
| • Hyperprolactinemia | • Malignancy (e.g. estrogen-producing ovarian tumors, androgen-producing tumors, or rhabdomyosarcoma) |
| • Thyroid disease | • Uterine lesions |

American College of Obstetricians and Gynecologists Committee Opinion. Obstet Gynecol 2015;126:e143–6

# EVALUATION

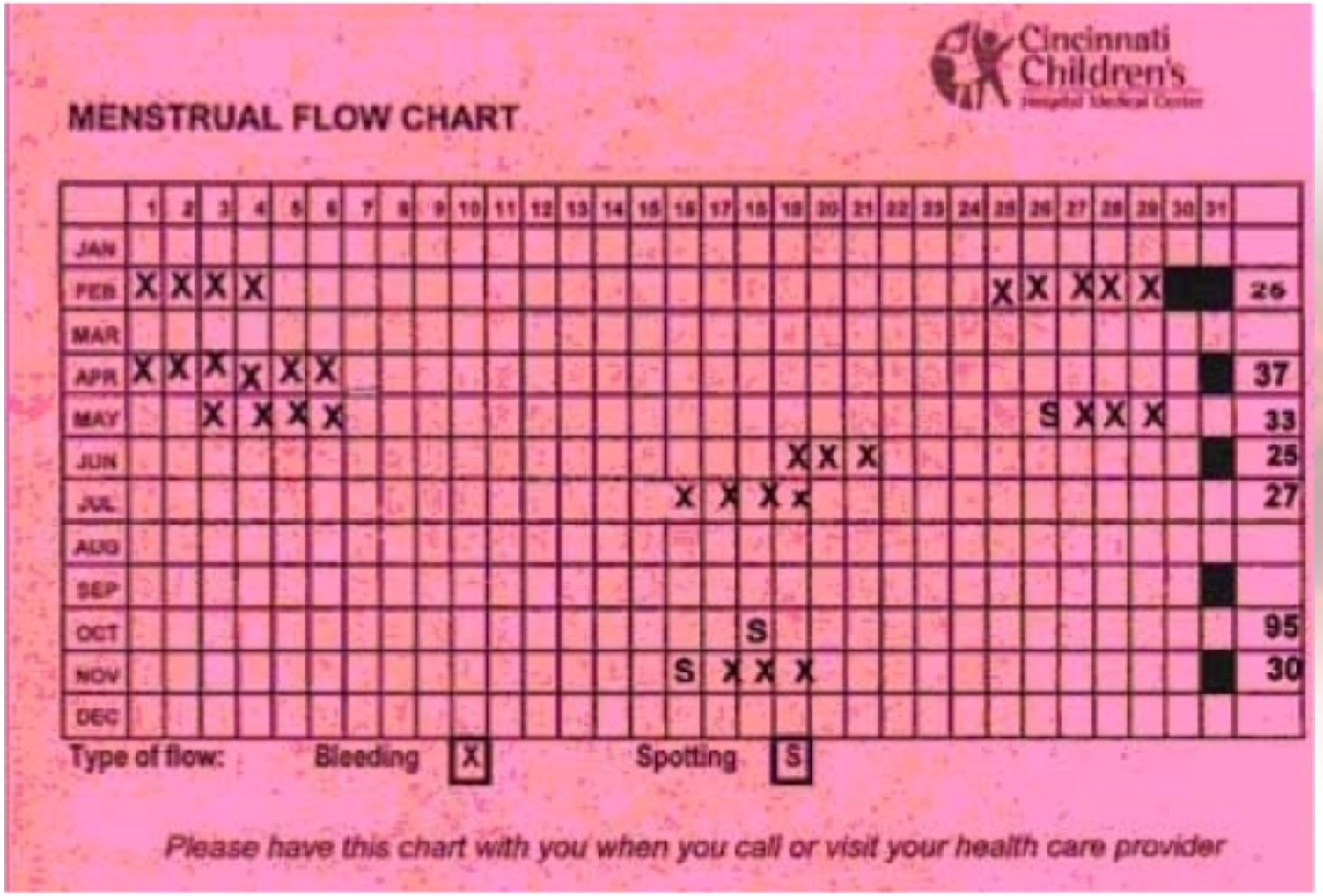
- History and Physical Examination
- Laboratory

# THE MENSTRUAL HISTORY

| For all patients: |
| --- |
| • Age at menarche |
| • Cycle length |
| • Duration of bleeding |
| • Perception of flow: heavy, medium or light |
| • Menstrual product use |
| • First day of LMP |
| • Dysmenorrhea |

Holland-Hall C. Heavy menstrual bleeding in adolescents:Normal variant or a bleeding disorder.http://contemporaryobgyn.modernmedicine.com/

# THE MENSTRUAL HISTORY

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# THE MENSTRUAL HISTORY

| For patients reporting heavy menstrual bleeding: |
| --- |
| • Lasts more than 7 days |
| • Soaking through pads/tampons in 1h for 2-3h in a row |
| • Require frequent pad or tampon changes (soaking more than one every 1-2 hour. |
| • Passing blood clots ≥ 1 inch in diameter (“about the size of a quarter”) |

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# THE MENSTRUAL HISTORY

**For patients reporting heavy menstrual bleeding:**

- Using “double protection” (pad plus tampon or 2 pads together)
- Flooding or gushing sensation
- Frequent “accidents” or leaking through protection
- Hemorrhage from a corpus luteum
- Diagnosed with anemia
- Associated with history of excessive bruising or bleeding or a family history of bleeding disorder

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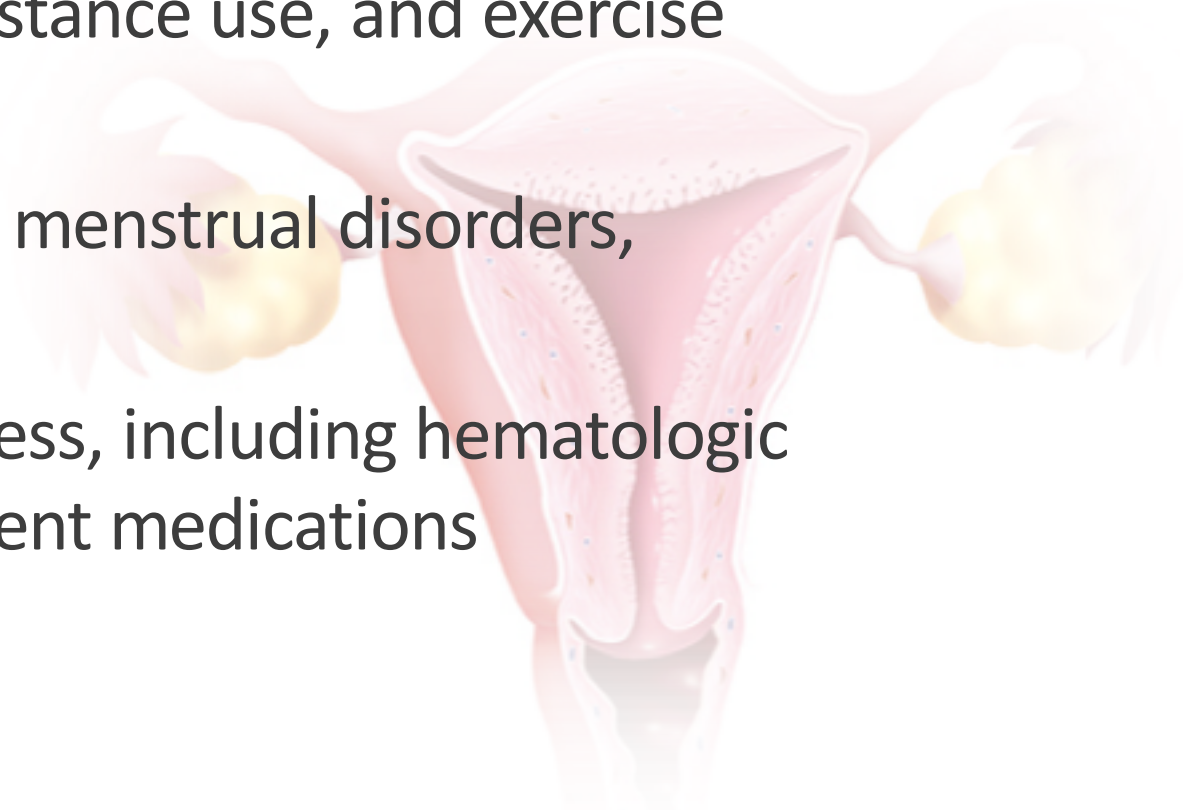
# MEDICAL HISTORY

| For patients reporting personal history of ≥1 of the following symptoms: |
| --- |
| • Epistaxis (>10min, or requiring medical attention), spontaneous bruising (>2cm), or minor wound bleeding (>5min) |
| • Bleeding from oral cavity or GI tract without an obvious anatomic lesion |
| • Prolonged or excessive bleeding after dental extraction or surgery |
| • Hemorrhage that required transfusion |

Rydz N and Jamieson MA. Managing heavy menstrual bleeding in adolescents. 2013. http://contemporaryobgyn.modernmedicine.com/

# MEDICAL HISTORY

- **Social history** –social stressors, substance use, and exercise patterns, and athletic competition.
- **Family history** –bleeding disorders, menstrual disorders, diabetes and thyroid
- P**ast medical history** – systemic illness, including hematologic or renal disease, and current or recent medications



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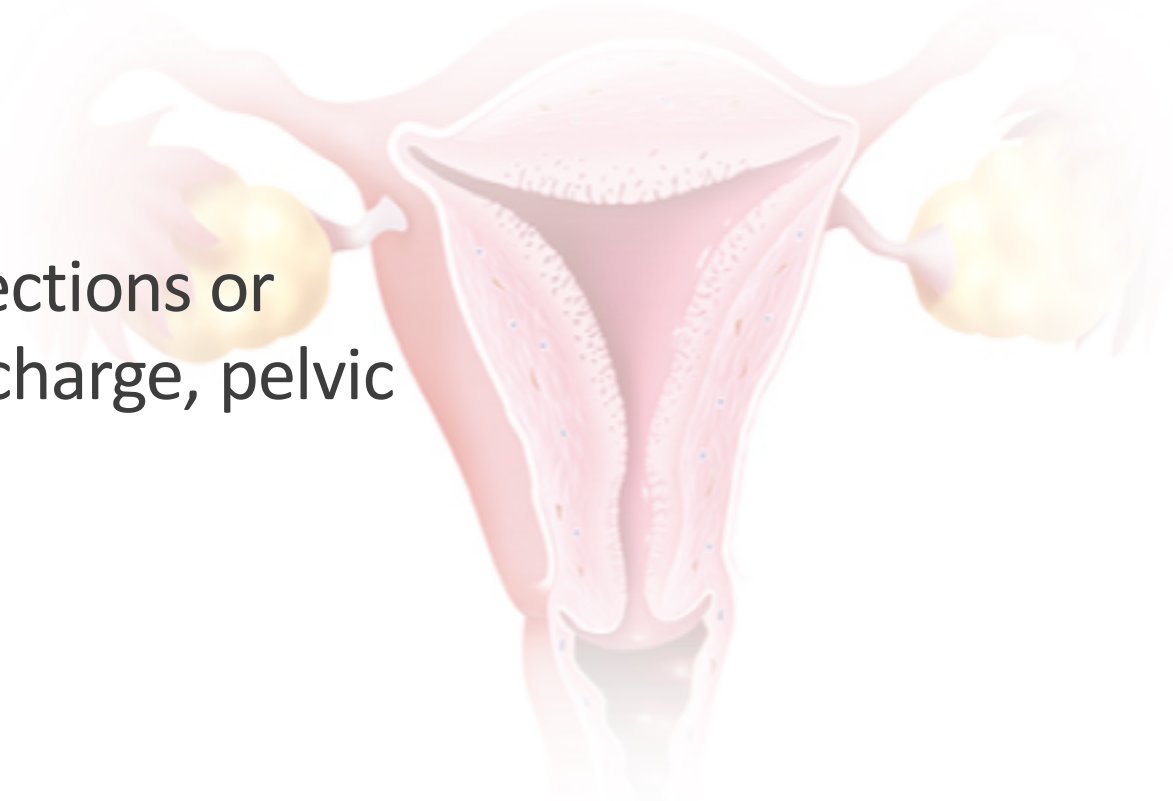
# MEDICAL HISTORY

- **Sexual history**
  - contraception and condom use
  - number of partners
  - history of sexually transmitted infections or current symptoms (eg, vaginal discharge, pelvic pain);
  - previous pregnancy or abortion
  - history of sexual abuse or assault



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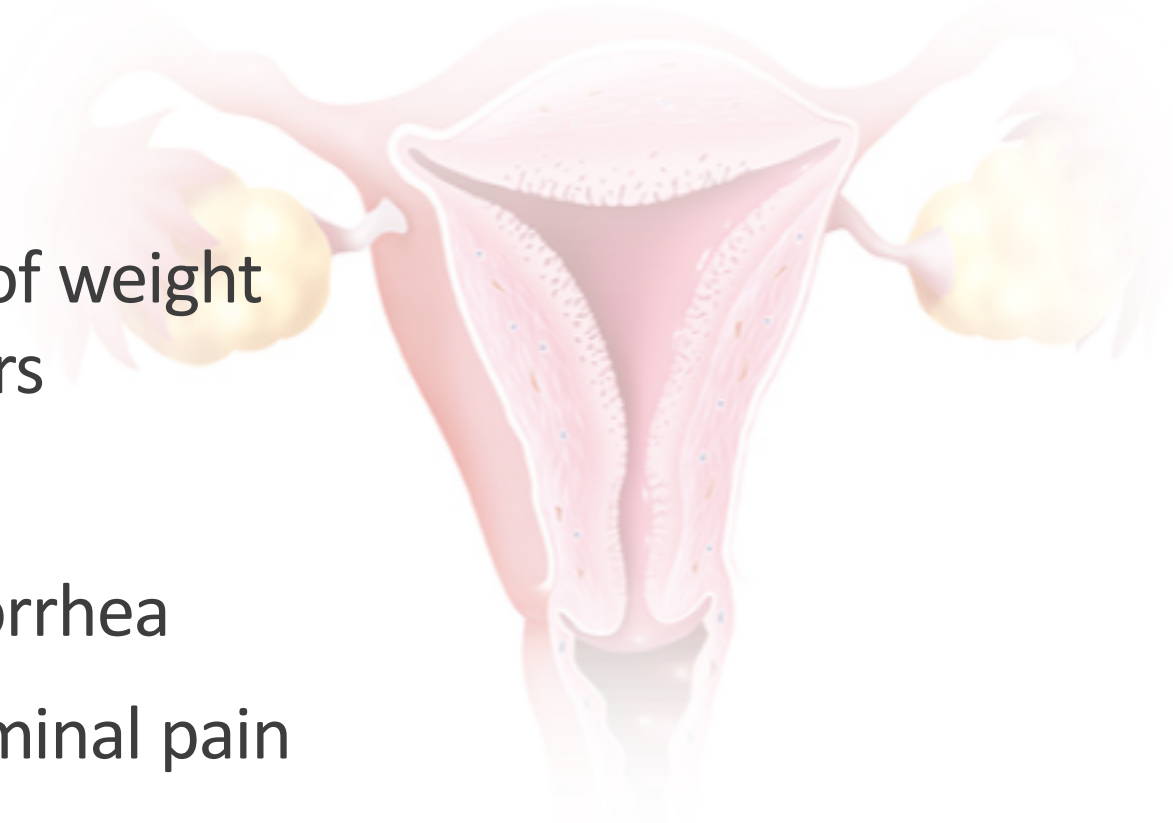
# MEDICAL HISTORY

- **Review of systems**
  - weight change (loss or gain)
  - Fatigue
  - self-induced vomiting as a means of weight control/disordered eating behaviors
  - hirsutism, acne
  - visual changes, headaches, galactorrhea
  - change in bowel habits, and abdominal pain



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# PHYSICAL EXAM

- Vital signs
  - tachycardia and hypotension may signal acute hemodynamic instability and the need for rapid intervention
  - The presence of tachycardia, pallor, or a heart murmur suggests anemia


Rydz N and Jamieson MA. Managing heavy menstrual bleeding in adolescents. 2013. http://contemporaryobgyn.modernmedicine.com/

# PHYSICAL EXAM

- Petechiae or excessive bruising: may suggest a platelet defect or another bleeding disorder.
- Obesity, acne, hirsutism, and acanthosis nigricans : may be present in a patient with PCOS.

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# PHYSICAL EXAM

- Palpation of the thyroid gland for enlargement or other abnormalities.
- Examination of the optic fundi and visual field testing (pituitary tumor)
- Sexual maturity rating of the breasts and assessment for galactorrhea.
- Palpation of the abdomen (pregnancy, uterine/ovarian mass).

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# PHYSICAL EXAM

- External inspection of the genitalia is sufficient for diagnosis in most patients.
- A sexually active patient may warrant a complete pelvic examination (speculum and bimanual exams).

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# LABORATORY EVALUATION

# LABORATORY EVALUATION

- Pregnancy test
- Complete blood count including differential and platelet count; blood typing
- Measure of iron stores
- prothrombin time and activated partial thromboplastin time


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Bennet AR and Gray SH. What to do when she's bleeding through: the recognition, evaluation, and management of abnormal uterine bleeding in adolescents. Curr Opin Pediatr 2014, 26:413–419

# LABORATORY EVALUATION

- von Willebrand studies (factor VIII, von Willebrand factor antigen (VWF:Ag), and ristocetin cofactor (VWF:RCo) activities.)
- TSH
- Test for *Chlamydia trachomatis* and *Neisseria gonorrhea*
- pelvic ultrasound

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# LABORATORY EVALUATION

- Patients with a history of amenorrhea or irregular bleeding prior to the onset of heavy bleeding should have:
  - FSH and LH
  - total and free testosterone levels
  - Dehydroepiandrosterone
  - prolactin level


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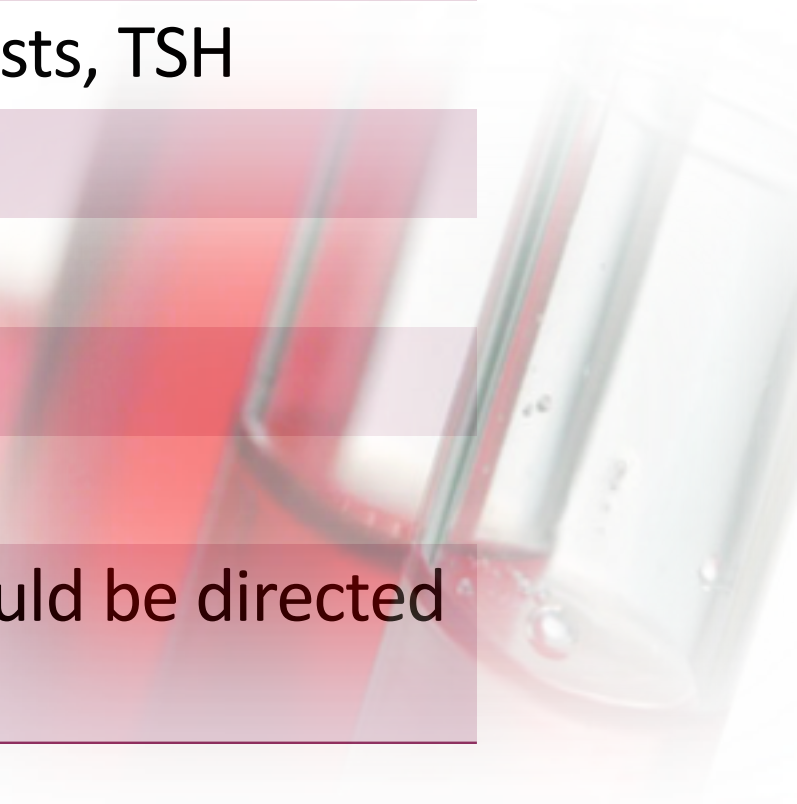
# SUGGESTED APPROACH TO INVESTIGATION OF BLEEDING DISORDERS

| | |
|---|---|
| **First line** | • CBC, PBS, APTT, PT, TT, fibrinogen |
| | • Ferritin, renal and liver function tests, TSH |
| | • VWF:Ag, VWF:Rco, FVIII |
| ***Second Line** | • Repeated VWF:AG, VWF:RCo, FVIII |
| | • Platelet function testing |
| ***Third line** | • Factor assays (eg II, V, VII, XI, XIII) |
| | • Further subspecialized testing should be directed by clinical picture |



***testing should be done in consultation with a hematologist**

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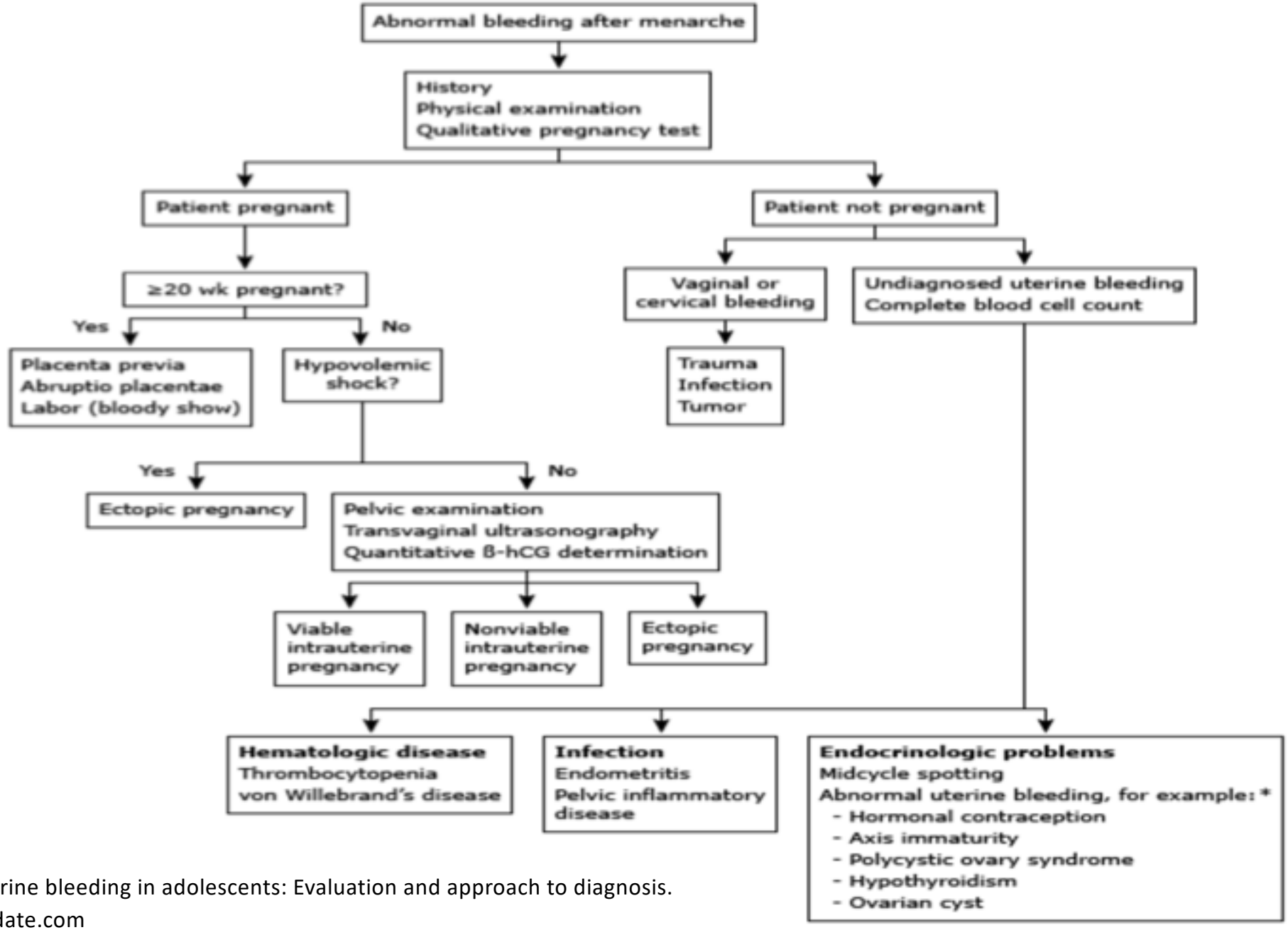
# Approach to vaginal bleeding in the postmenarcheal adolescent

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# MANAGEMENT

# MANAGEMENT

- The management of AUB depends on:
  - assessment of whether or not the patient is hemodynamically stable
  - determination of the underlying cause
  - medical management based on etiology and the severity of anemia.

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# THE GOALS OF TREATMENT ARE TO:

- Establish and/or maintain  hemodynamic stability
- Correct acute or chronic anemia
- Return to a pattern of normal menstrual cycles
- Prevent of recurrence
- Prevent long-term consequences of anovulation (eg, anemia, infertility, endometrial cancer)

De Silva N. Abnormal uterine bleeding in adolescents: Management. March 2017. www.uptodate.com

# MEDICAL TREATMENT

- The goal of medical therapy is to stabilize the endometrium with estrogen that will provide initial hemostasis, followed by progestins for endometrial stability.

Bennet AR and Gray SH. What to do when she's bleeding through: the recognition, evaluation, and management of abnormal uterine bleeding in adolescents. Curr Opin Pediatr 2014, 26:413–419

# MEDICAL TREATMENT

- Typically, this is achieved with combined oral contraceptive pills (OCPs) taken continuously for several months until hemodynamically stable, as withdrawal of either hormone will cause recurrent bleeding.

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# MEDICAL TREATMENT

- Episodes of moderate-to-severe bleeding can typically be treated effectively with frequent dosing of combined oral contraceptive pills.

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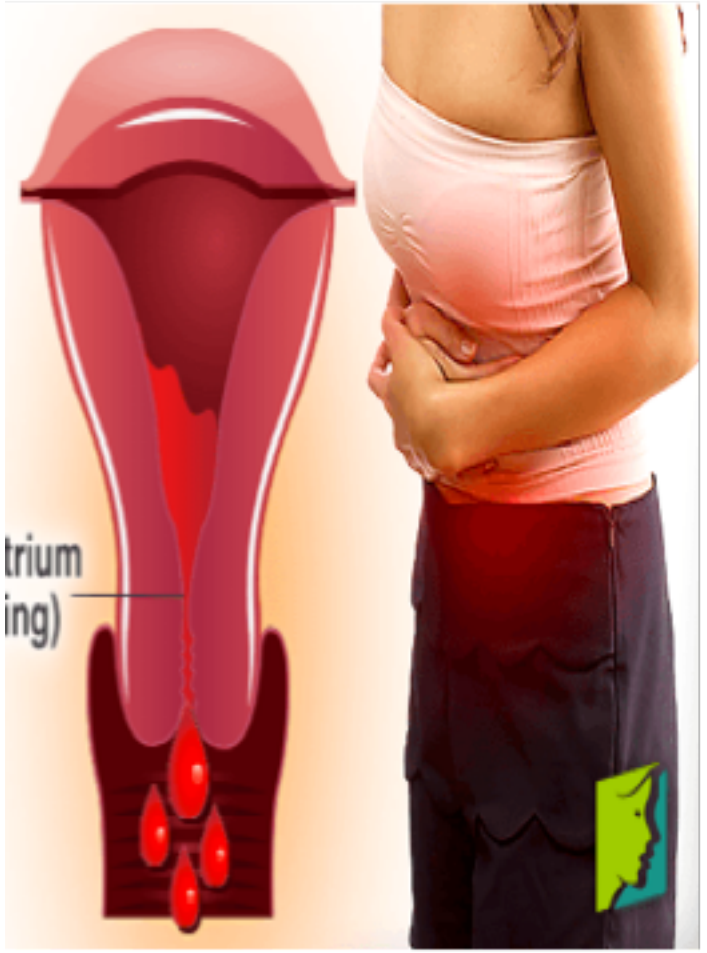
# ACUTE MANAGEMENT OF MILD ANOVULATORY UTERINE BLEEDING

- Mild anovulatory uterine bleeding: longer than normal menses or shortened cycles for ≥2 months, with slightly to moderately increased flow;
  - Hgb is usually normal (≥12 g/dL), but may be mildly decreased (eg, 10 to 12 g/dL).
- If normal Hgb; no desire for contraception → observation and reassurance.

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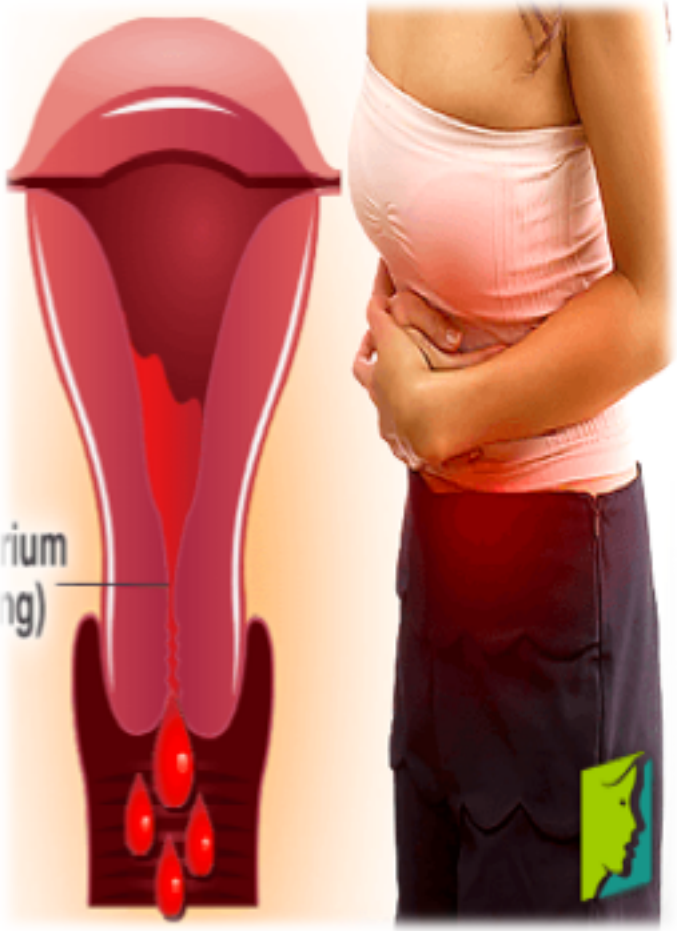
# ACUTE MANAGEMENT OF MILD ANOVULATORY UTERINE BLEEDING

- if Hgb 10-12 g/dL:
  - observation and reassurance
  - hormonal therapy to stabilize endometrial proliferation and promote cyclic shedding are both acceptable options.
  - Iron supplementation (60 mg elemental iron/day)
  - Naproxen or Ibuprofen



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# ACUTE MANAGEMENT OF MILD ANOVULATORY UTERINE BLEEDING

- Girls with mild anovulatory uterine bleeding should keep a menstrual calendar
- They should follow up in three to six months unless bleeding becomes more severe, in which case they should be seen acutely.


Year _____

| Month | 1 | 3 | 5 | 7 | 9 | 11 | 13 | 15 | 17 | 19 | 21 | 23 | 25 | 27 | 29 | 31 | No. of days from start of period to beginning of next |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Jan. | | | | | | | | | | | | | | | | | |
| Mar. | | | | | | | | | | | | | | | | | |
| May | | | | | | | | | | | | | | | | | |
| Jul. | | | | | | | | | | | | | | | | | |
| Sep. | | | | | | | | | | | | | | | | | |
| Nov. | | | | | | | | | | | | | | | | | |

Don't forget to have this chart with you when you call or visit your doctor.

**Type of flow**

Normal X
Exceptionally light O
Exceptionally heavy ■
Spotting S

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# ACUTE MANAGEMENT OF MODERATE ANOVULATORY UTERINE BLEEDING

- **Moderate AUB**: menses >7d or cycle frequency  3 weeks; mild anemia (Hgb 10-11 g/dl)
  - If patient not bleeding significantly at time of visit and is not on hormonal therapy →start 1 pill daily
  - If patient with moderate bleeding at time of visit →  1 pill BID until bleeding stops, then daily for total of 21 days

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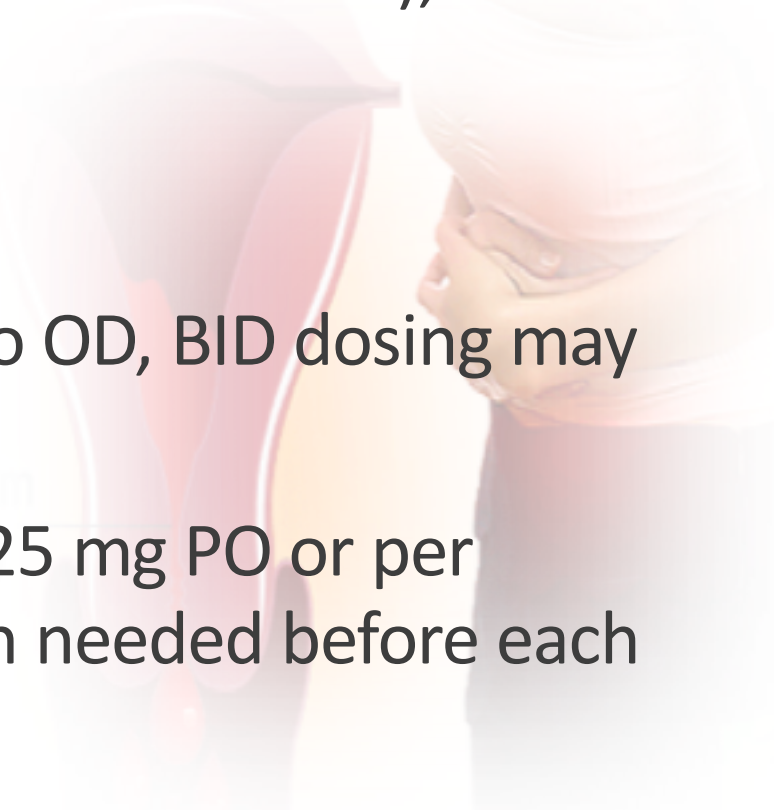
# OR…..

- One pill q8h until the bleeding stops (usually within 48 hours), then
- One pill BID for 5 days, then
- One pill OD for a total of at least 21 days
- If bleeding recurs when the dose is decreased to OD, BID dosing may be necessary for the full 21 days.
- Antiemetic therapy (eg, promethazine 12.5 to 25 mg PO or per rectum or ondansetron 4 to 8 mg orally) is often needed before each dose of the pill



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# ACUTE MANAGEMENT OF MODERATE ANOVULATORY UTERINE BLEEDING

- If estrogen contraindicated: progestins such as norethindrone acetate (5 to 10 mg daily) or micronized progesterone (200 mg before bedtime)
- Follow Hgb as needed: consider continuing pills at least until Hgb is normal (min 3-6 months)
- treat with iron supplementation.

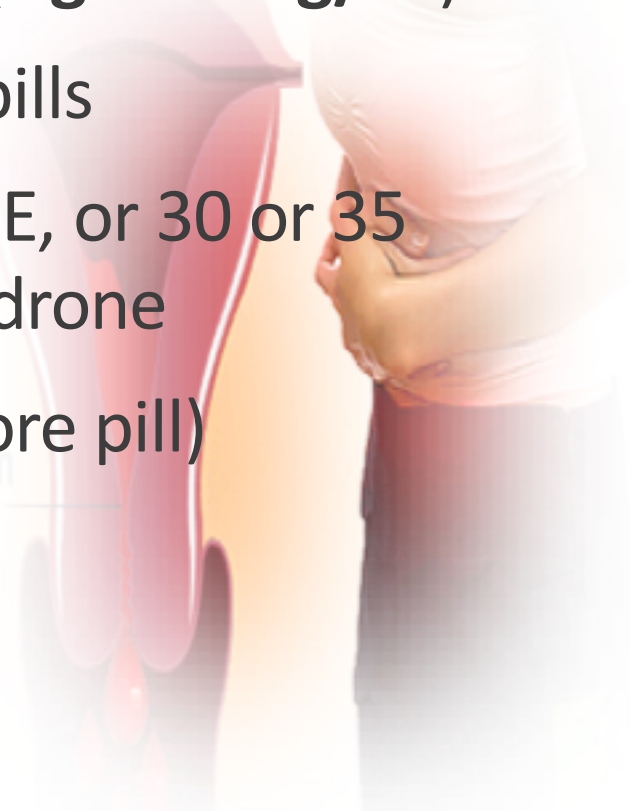
Bennet AR and Gray SH. What to do when she's bleeding through: the recognition, evaluation, and management of abnormal uterine bleeding in adolescents. Curr Opin Pediatr 2014, 26:413–419

| Drug | Source | Suggested Dose | Dose Schedule | Potential Contraindications and Precautions According to FDA Labeling* |
|---|---|---|---|---|
| Conjugated equine estrogren | DeVore GR, Owens O, Kase N. Use of intravenous Premarin in the treatment of dysfunctional uterine bleeding—a double-blind randomized control study. Obstet Gynecol 1982;59: 285–91. | 25 mg IV | Every 4–6 hours for 24 hours | Contraindications include, but are not limited, to breast cancer, active or past venous thrombosis or arterial thromboembolic disease, and liver dysfunction or disease. The agent should be used with caution in patients with cardio-vascular or thromboembolic risk factors. |
| Combined oral contraceptives† | Munro MG, Mainor N, Basu R, Brisinger M, Barreda L. Oral medroxyprogesterone acetate and combination oral contraceptives for acute uterine bleeding: a randomized controlled trial. Obstet Gynecol 2006;108:924–9. | Monophasic combined oral contraceptive that contains 35 micrograms of ethinyl estradiol | Three times per day for 7 days | Contraindications include, but are not limited to, cigarette smoking (in women aged 35 years or older), hypertension, history of deep vein thrombosis or pulmonary embolism, known thromboembolic disorders, cerebrovascular disease, ischemic heart disease, migraine with aura, current or past breast cancer, severe liver disease, diabetes with vascular involvement, valvular heart disease with complications, and major surgery with prolonged immobilization. |

| | | | | |
|---|---|---|---|---|
| Medroxypro-gesterone acetate‡ | Munro MG, Mainor N, Basu R, Brisinger M, Barreda L. Oral medroxyprogesterone acetate and combination oral contracep-tives for acute uterine bleeding: a randomized controlled trial. Obstet Gynecol 2006;108:924–9. | 20 mg orally | Three times per day for 7 days | Contraindications include, but are not limited to, active or past deep vein thrombosis or pulmonary embolism, active or recent arterial thromboembolic disease, current or past breast cancer, and impaired liver function or liver disease. |
| Tranexamic acid | James AH, Kouides PA, Abdul-Kadir R, Dietrich JE, Edlund M, Federici AB, et al. Evaluation and management of acute menorrhagia in women with and without underlying bleeding disorders: consensus from an international expert panel. Eur J Obstet Gynecol Reprod Biol 2011;158:124–34. | 1.3 g orally§<br>or<br>10 mg/kg IV (maximum 600 mg/dose) | Three times per day for 5 days<br>(every 8 hours ) | Contraindications include, but are not limited to, acquired impaired color vision and current thrombotic or thromboembolic disease. The agent should be used with caution in patients with a history of thrombosis (because of uncertain thrombotic risks), and concomitant administration of combined oral contraceptives needs to be care-fully considered. |

# ACUTE MANAGEMENT OF SEVERE ANOVULATORY UTERINE BLEEDING

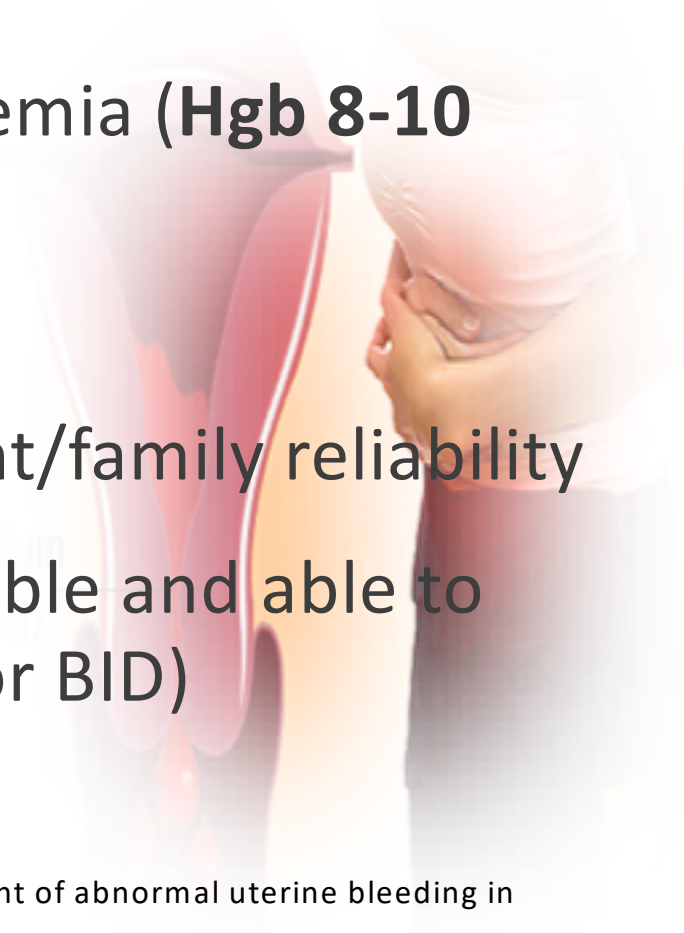
- **Severe AUB**: ongoing heavy bleeding; moderate anemia (**Hgb 8-10 g/dL**)
  - If bleeding is slowing and Hgb> 9 g/dL : start with BID pills
  - If bleeding not slowing:  monophasic COC (ie, 50 mcg EE, or 30 or 35 mcg EE) and either 0.5 mg norgestrel or 1 mg norethindrone
    - 1 pill q4-6h for 2-4 days (prn anti-emetic 2h before pill)
    - 1 pill q8h x 3 days
    - 1 pill q12h for at least 2 weeks



Bennet AR and Gray SH. What to do when she's bleeding through: the recognition, evaluation, and management of abnormal uterine bleeding in adolescents.  Curr Opin Pediatr 2014, 26:413–419 ; De Silva N. Abnormal uterine bleeding in adolescents: Management. March 2017. www.uptodate.com

# ACUTE MANAGEMENT OF SEVERE ANOVULATORY UTERINE BLEEDING

- **Severe AUB**: ongoing heavy bleeding; moderate anemia (**Hgb 8-10 g/dL**)
  - Follow serial Hgb closely
  - Consider inpatient admission if concern for patient/family reliability
  - iron supplementation as soon as the patient is stable and able to take pills by mouth (60 mg of elemental iron OD or BID)



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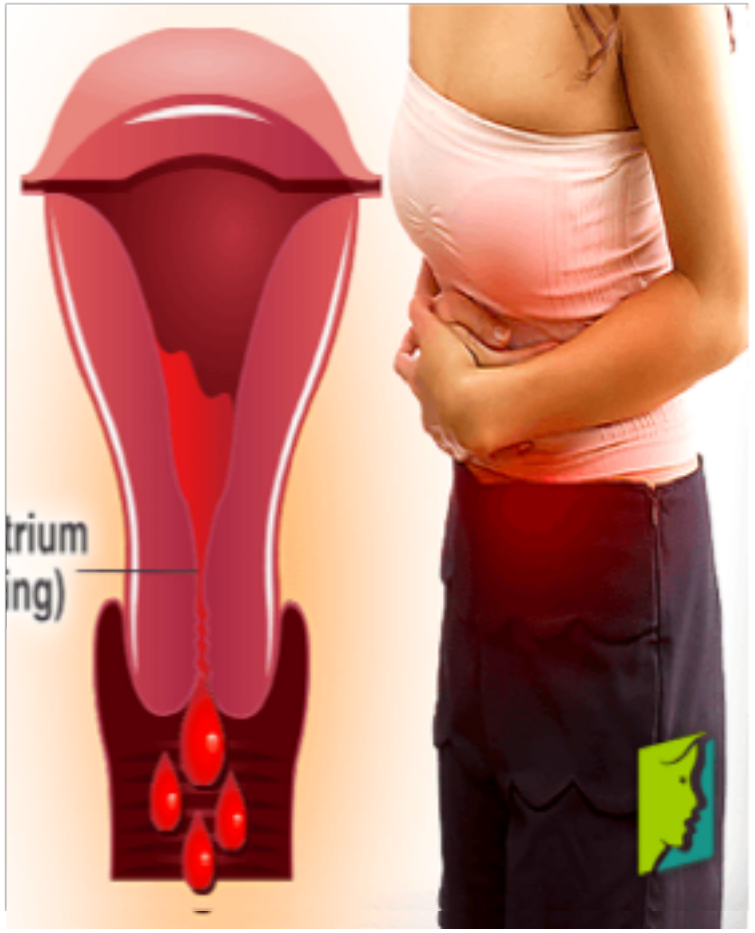
# ACUTE MANAGEMENT OF SEVERE ANOVULATORY UTERINE BLEEDING

- **Severe AUB**: Ongoing heavy bleeding, Hgb 7 g/dl, orthostatic hypotension:
  - Admit for inpatient management
  - Decide if blood transfusion needed
  - Most patients can be managed with OCPs
  - D&C rarely indicated



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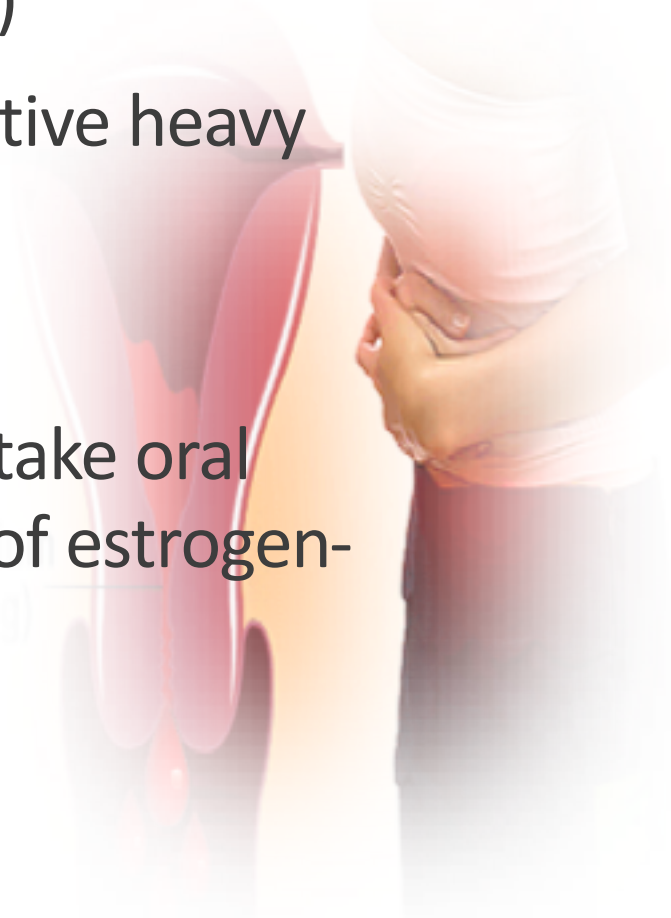
# INDICATIONS FOR HOSPITALIZATION

- Hemodynamic instability (eg, tachycardia, hypotension)
- Hemoglobin concentration <7 g/dL or <10 g/dL with active heavy bleeding
- Symptomatic anemia (eg, fatigue, lethargy)
- Need for intravenous conjugated estrogen (eg, cannot take oral medications, continued heavy bleeding after 24 hours of estrogen-progestin combination therapy)
- Need for surgical intervention (rare)



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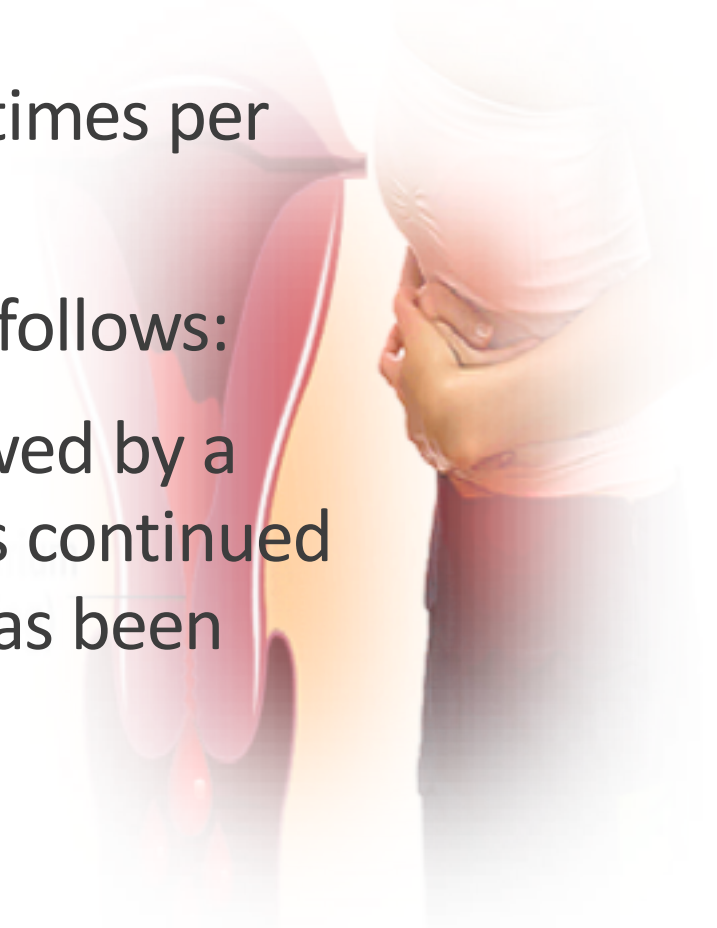
# ACUTE MANAGEMENT OF SEVERE ANOVULATORY UTERINE BLEEDING

- In patients who need intravenous treatment:
  - IV conjugated estrogen: 25 mg q4-6h until the bleeding stops. (No more than six doses should be administered)
- In cases of severe menorrhagia unresponsive to 24 hours of hormonal therapy or in those with platelet dysfunction:
  - nonhormonal hemostatic drugs (antifibrinolytic compounds, aminocaproic acid or tranexamic acid, or desmopressin)

De Silva N. Abnormal Uterine Bleeding in the Adolescent Patient. The Female Patient . Vol 35. JULY 2010

# ACUTE MANAGEMENT OF SEVERE ANOVULATORY UTERINE BLEEDING

- Tranexamic acid is administered orally: 1000 mg three times per day for up to five days with each menses
- Aminocaproic acid may be administered orally or IV as follows:
  - Aminocaproic acid 5 g PO during the first hour, followed by a continuous dose of 1 to 1.25 g per hour; treatment is continued for approximately eight hours or until the bleeding has been controlled, **or**



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# ACUTE MANAGEMENT OF SEVERE ANOVULATORY UTERINE BLEEDING

- Aminocaproic acid 4 to 5 g IV during the first hour of treatment, followed by a continuous infusion at a rate of 1 g per hour; treatment is continued for approximately eight hours or until the bleeding has been controlled.
- Desmopressin 0.3 mcg/kg IV over 15 to 30 minutes; the dose may be repeated in 48 hours if there is no response

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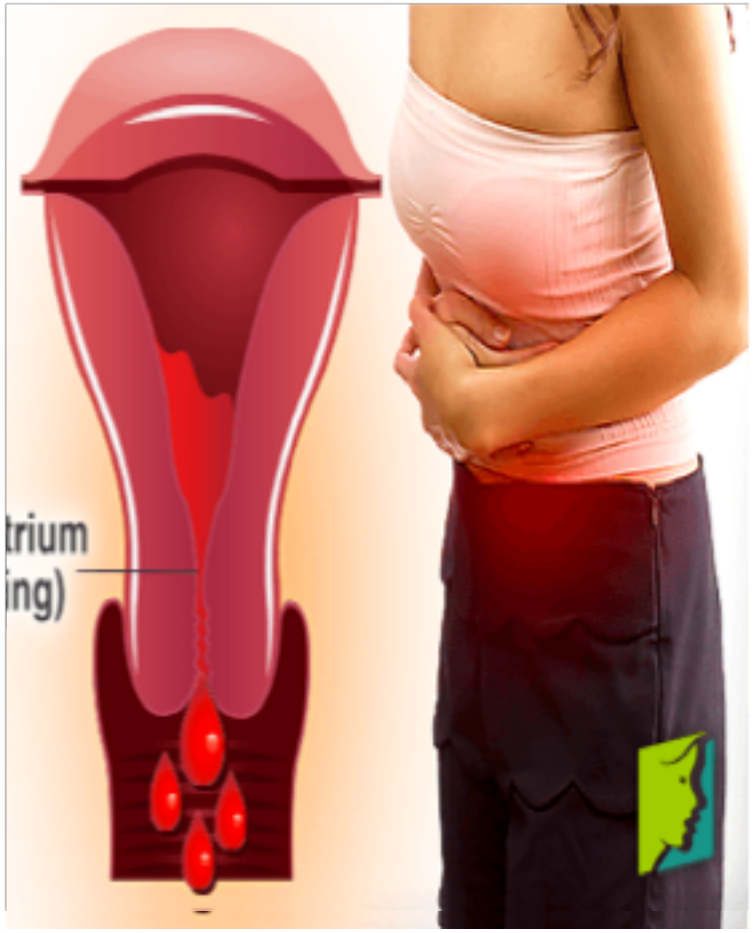
# ACUTE MANAGEMENT OF SEVERE ANOVULATORY UTERINE BLEEDING

- In patients who need intravenous treatment:
  - Treatment is continued for approximately 8 hours or until the bleeding has been controlled.
  - Administration of antiemetics (eg, promethazine 12.5 to 25 mg orally, IV, or per rectum) 1h before each dose of IV estrogen



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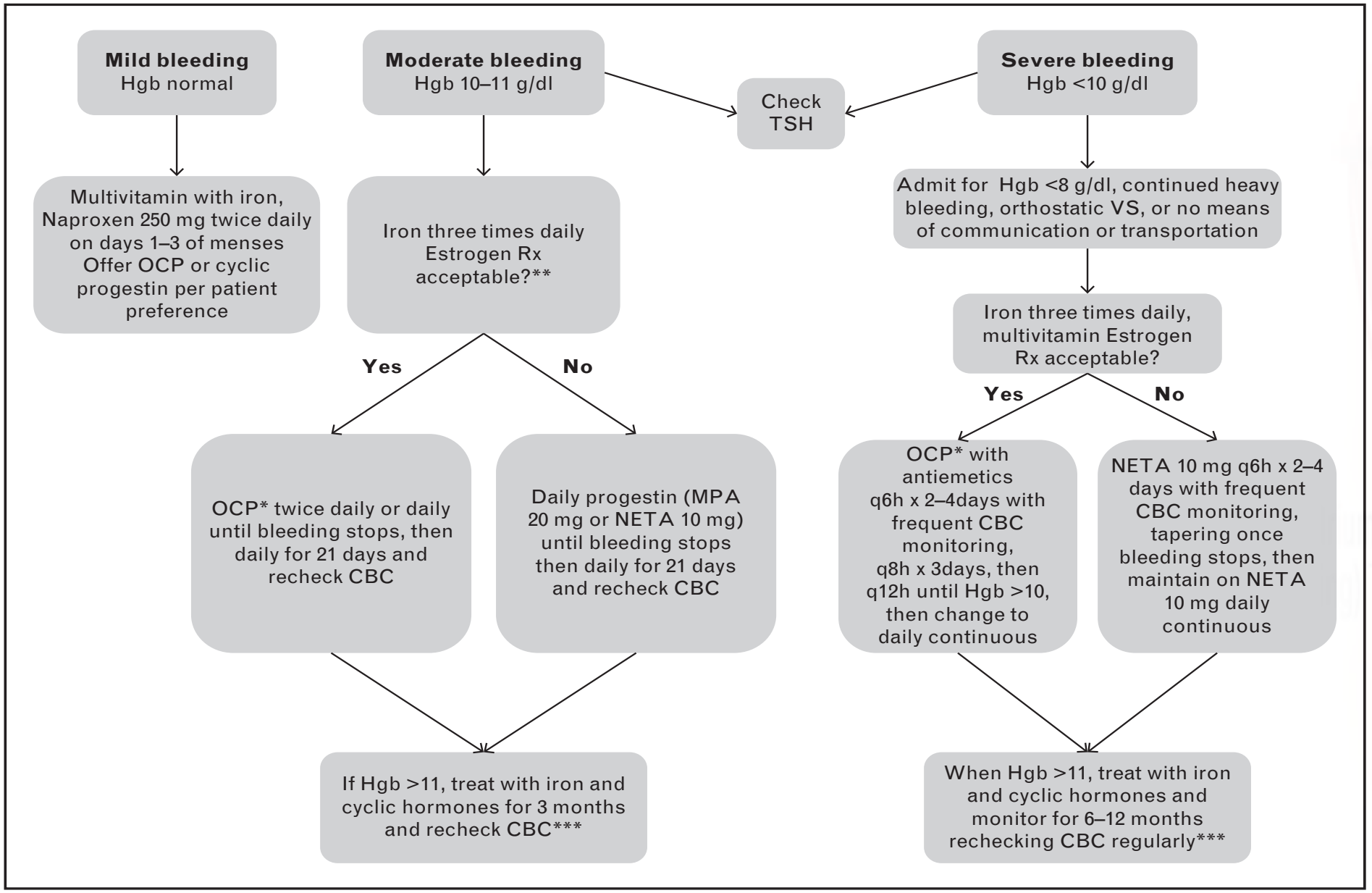



Bennett AR and Gray SH. What to do when she's bleeding through the recognition, evaluation, and management of AUB in adolescents. Curr Opin Pediatr 2014, 26:413–419

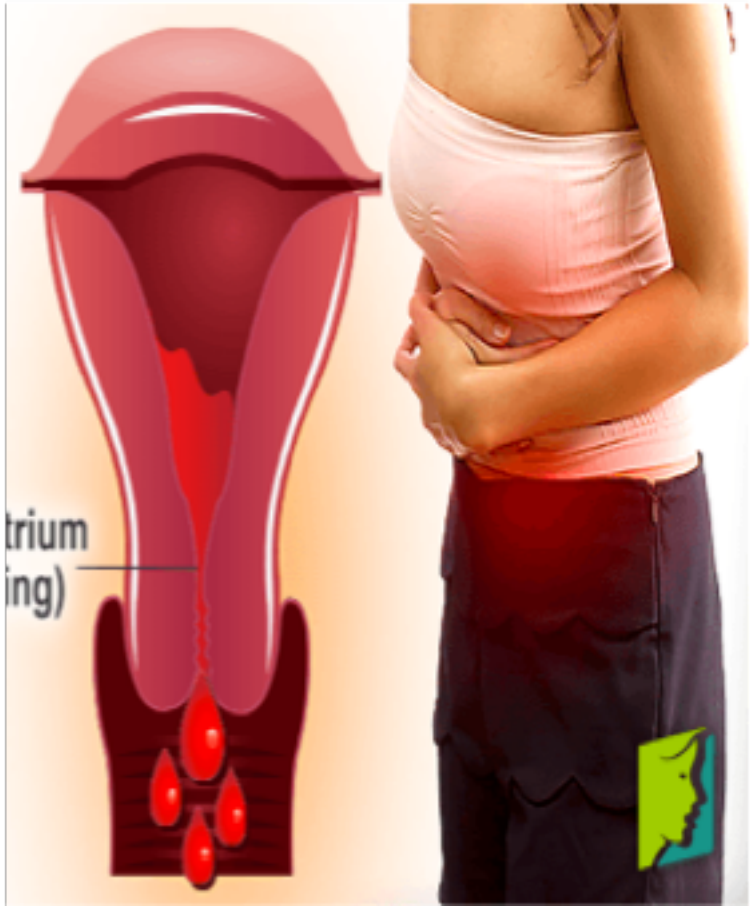
# REFRACTORY UTERINE BLEEDING

- Additional evaluation (examination under anesthesia, endometrial sampling, D&C) may be necessary if hormonal and hemostatic regimens fail to control bleeding within 24 to 36 hours
- Therapeutic D&C should be reserved for the rare patient who has life-threatening bleeding despite other therapies
- If D&C is performed in adolescents, care must be taken to prevent scarring of the endometrial lining

De Silva N. Abnormal uterine bleeding in adolescents: Management. March 2017. www.uptodate.com

# CHRONIC AUB

- Multiple treatment options are available for term treatment of chronic AUB:
  - levonorgestrel intrauterine system
  - OCs (monthly or extended cycles)
  - progestin therapy (oral or intramuscular)
  - tranexamic acid
  - NSAIDs



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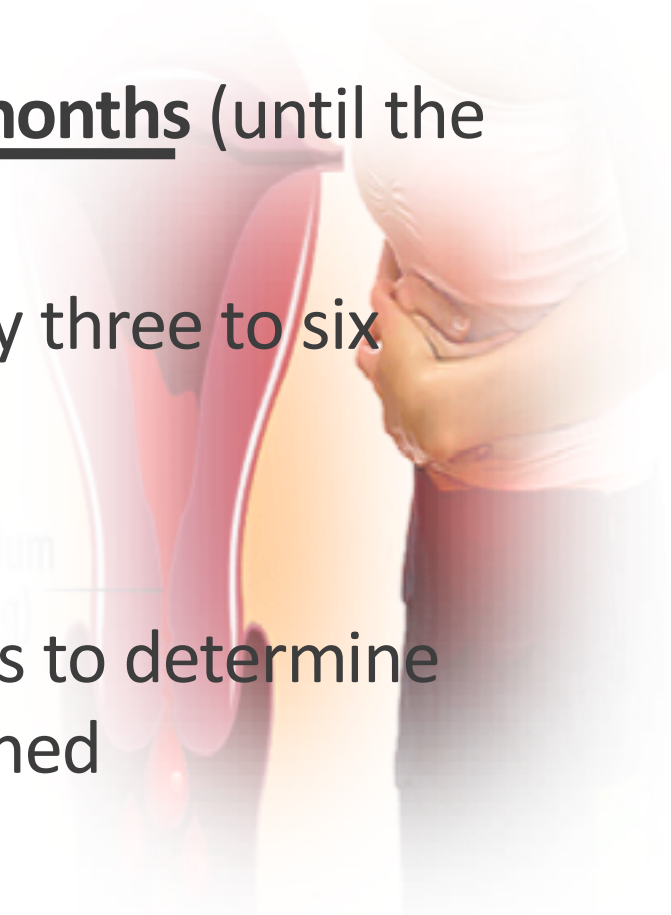
# FOR GIRLS WHOSE ACUTE BLEEDING WAS CONTROLLED WITH AN ESTROGEN-CONTAINING REGIMEN, HGB <10 G/DL

- Monophasic COCs OD continuously for **at least three months** (until the hemoglobin is ≥10 g/dL)
- Monitor hgb monthly until it is ≥10 g/dL and then every three to six months until it is >12 g/dL.
- Continuous COC may be followed by cyclic therapy
- Hormonal therapy can be discontinued after six months to determine whether a normal menstrual pattern has been established



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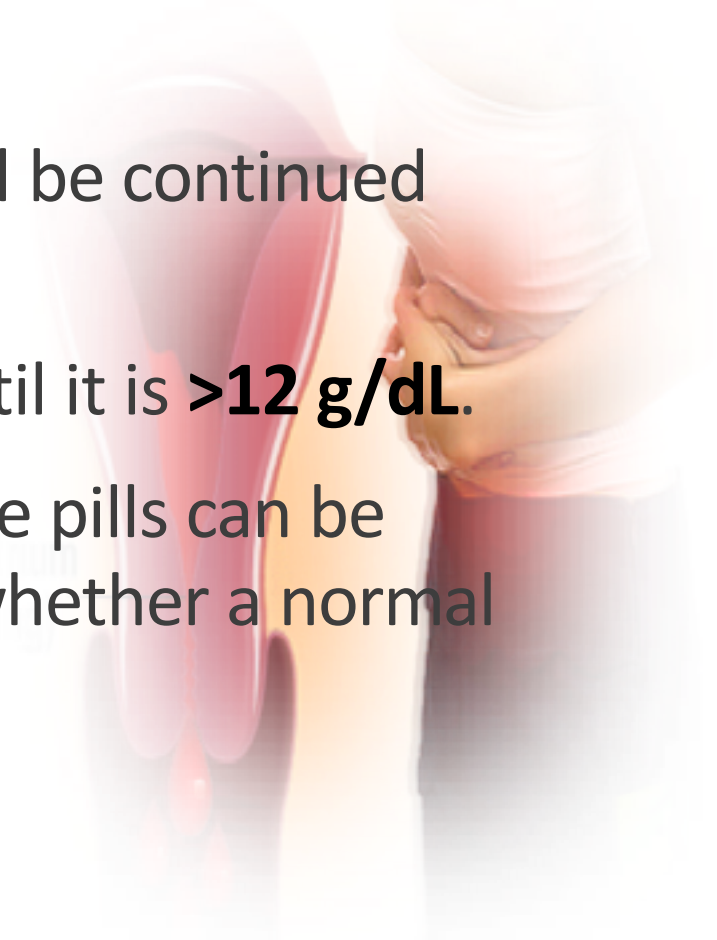
# FOR GIRLS WHOSE ACUTE BLEEDING WAS CONTROLLED WITH AN ESTROGEN-CONTAINING REGIMEN, HGB >10 G/DL

- Monophasic COC with at least 30 mcg ethinyl estradiol be continued cyclically for three to six months.
- We monitor hemoglobin every three to six months until it is **>12 g/dL**.
- Hormonal therapy with combination oral contraceptive pills can be discontinued after three to six months to determine whether a normal menstrual pattern has been established



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# FOLLOW-UP AND LONG-TERM CARE

- Most experts recommend continuing hormonal therapy for at least 6 months.
- After therapy is discontinued, the patient should still be followed to ensure regulation of menstruation.
- maintain a menstrual calendar

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# FOLLOW-UP AND LONG-TERM CARE

- Chronic anovulation is associated with endometrial hyperplasia/cancer
- Concomitant obesity promotes peripheral conversion of androgens to estrogens, further enhancing endometrial growth.
- EM biopsy may be warranted in adolescents who have a history of **2-3 years** of **untreated** anovulatory bleeding, particularly if they are obese or have a family history of endometrial, ovarian, breast, or colon cancer

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# PROGNOSIS

- Anovulatory AUB generally resolves with maturation of the HPO axis.
- In girls who begin menses at <12 years, between 12 and 13 years, and >13 years of age, 50 percent of cycles are ovulatory by one year, three years, and 4.5 years, respectively.
- Normal cycle length is not established until the sixth gynecological year, at an average age of **19 years.**
- The long-term prognosis depends upon the underlying cause

# SUMMARY

- AUB is a common adolescent complaint and is often due to anovulatory cycles (immature HPO axis)
- 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.
- A thorough history and physical examination rules out the majority of disorders in the differential diagnosis.

# SUMMARY

- All adolescents reporting heavy bleeding should receive a complete blood count with differential and platelet count, in addition to a pregnancy test.
- Females with heavy bleeding at menarche, a personal or family history of bleeding, or severe anemia should be screened for a bleeding disorder
- Episodes of moderate-to-severe bleeding can typically be treated effectively with frequent dosing of combined oral contraceptive pills.

- Thank You