

# Modern Management of Menstrual Disorders in Adolescents

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# Disclosure

- I have no financial relationships relevant to this educational activity.
- I absolutely love my work as a Pediatric Adolescent Gynecologist!



# Objectives

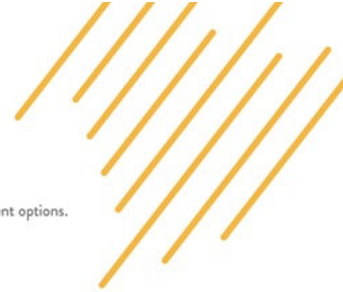
At the end of this presentation, I hope I have:

- Clarified the differential diagnosis of menstrual disorders in adolescent versus adult women
  - Which causes are most likely in adolescents?
  - What are essential components of the work-up?
  - How does management differ? (hint...don't give them their mother's OC)
- Provided tips for working with the adolescent population
  - Office guidelines
  - ACOG Resources
  - Parents and confidentiality

# 21 REASONS

## HEALTH

1. Learn healthy lifestyles and feel good about yourself.
2. Discuss good habits for healthy bones.
3. Learn if you have a urinary tract infection and the treatment options.
4. Get treatment for vaginal itching, discharge, or odor.



## PERIODS

5. Learn if your periods are normal.
6. Get relief if your periods are painful.
7. Find out why your periods are too heavy.
8. Know about the timing of your periods and why bleeding occurs in between.
9. Learn ways to deal with premenstrual syndrome (PMS).

## PREGNANCY

15. Get birth control so you can better plan.
16. Discuss the ideal time to start a family.
17. Get tested for pregnancy.
18. Weigh your options if you become pregnant.

## SEXUALITY & RELATIONSHIPS

10. Maintain healthy relationships with a boyfriend or girlfriend.
11. Learn about healthy, consensual relationships.
12. Talk about lesbian, gay, bisexual, and transgender (LGBT) topics.
13. Learn about safe sex.
14. Understand how your reproductive system works.

## SEXUALLY TRANSMITTED INFECTIONS

19. Learn how to protect and lower your risk from sexually transmitted infections (STIs) and human immunodeficiency virus (HIV).
20. Get tested for STIs and HIV if you are sexually active.
21. Get the human papillomavirus (HPV) vaccine.

## TO SEE A GYNECOLOGIST BEFORE YOU TURN 21

ALTHOUGH MOST YOUNG WOMEN DON'T NEED TO HAVE A PAP TEST UNTIL THEY ARE 21 YEARS OLD, THERE ARE AT LEAST 21 REASONS TO SEE A GYNECOLOGIST BEFORE THEN. LEARN MORE AT [ACOG.ORG/AYAGUIDE](https://www.acog.org/AYAGUIDE).



# What are common reasons adolescent girls present to an OBGYN office?

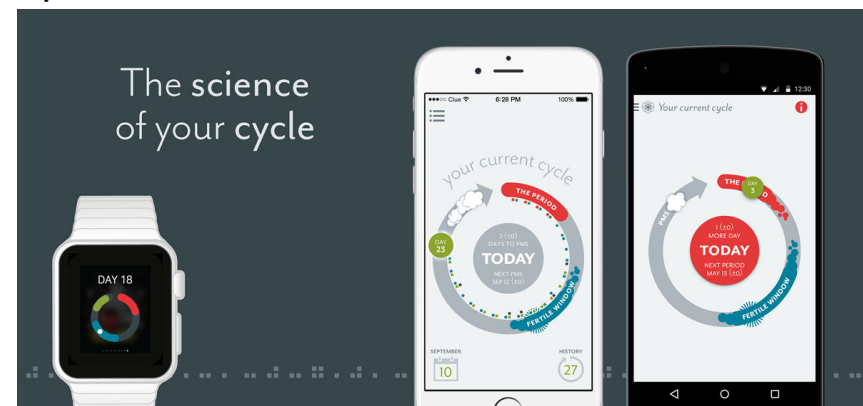
- Menstrual disorders
- Pelvic pain
- Ovarian masses
- Vulvar pain
- Labial hypertrophy
- Vaginal discharge and/or odor
- Acne/hirsutism
- Mood swings
- Contraception/STI testing
- Transgender care

## A 15 year old presents to your office with heavy painful menses...

- Menarche was at 12 years of age
- Menses initially were irregular, but now are regular, lasting 10 days
- She reports heavy menstrual bleeding, passing clots and changing a pad or tampon 6-8 times per day
- She has severe cramps, not relieved by ibuprofen, or other OTC medications. She is missing school for pain 2 days per month.
- What are the most common causes of her symptoms in this age group?

# Normal Menstrual Cycles in Young Females

- ACOG Committee Opinion 651: Menstruation in Girls and Adolescents: Using the Menstrual Cycle as a Vital Sign (December 2015)
- During the first 2 years after menarche, cycles may be irregular, but 90% of girls will have cycles in the range of 21-42 days (mean 32.2 days)
  - Flow length: 2-8 days of flow (mean 7 days or less)
  - Interval between menarche and regular cycles is about 14 months
  - Mean product use: 3-6 pads/tampons per day
- Evaluate if
  - Cycles are persistently less than 21 days or greater than 45 days
  - Cycles are initially regular then become irregular
  - Flow lasts more than 7 days
  - **Patient tells you she is bleeding too heavily!**



# FIGO Classification of Abnormal Uterine Bleeding

Abnormal Uterine Bleeding  
Heavy menstrual bleeding (AUB/HMB)  
Intermenstrual bleeding (AUB/IMB)

## **PALM**-Structural Causes

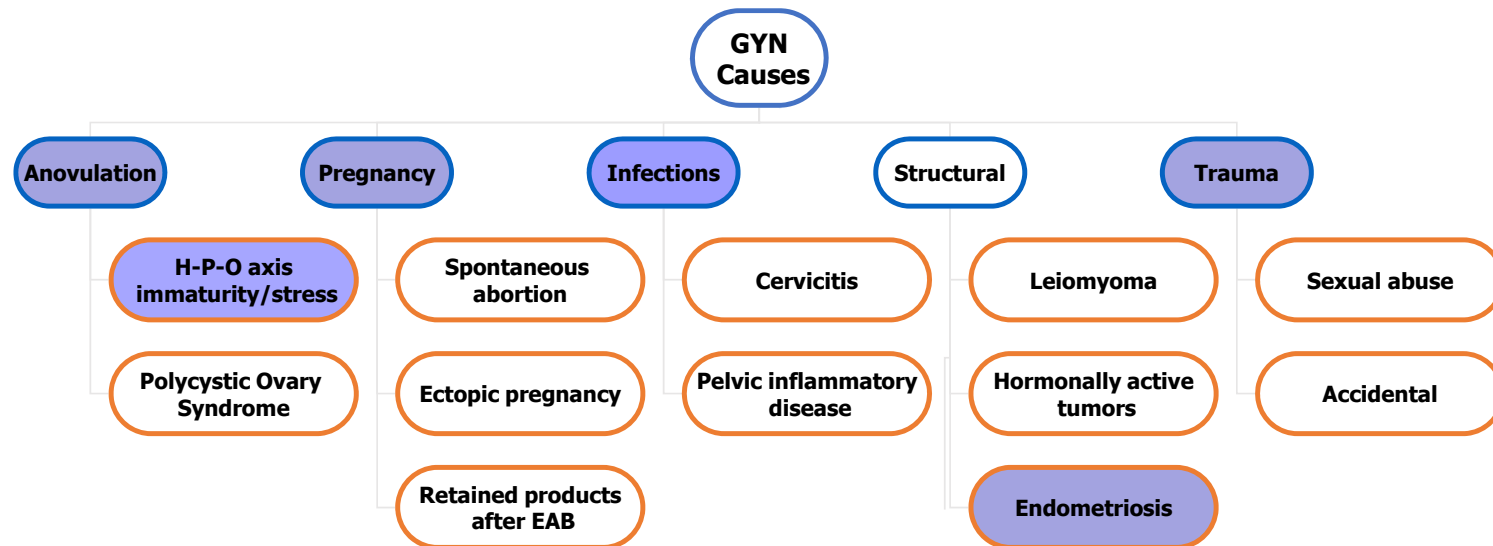
**P**olyp  
**A**denomyosis/endometriosis  
**L**eiomyoma  
**M**alignancy and hyperplasia

## **COEIN**-Nonstructural

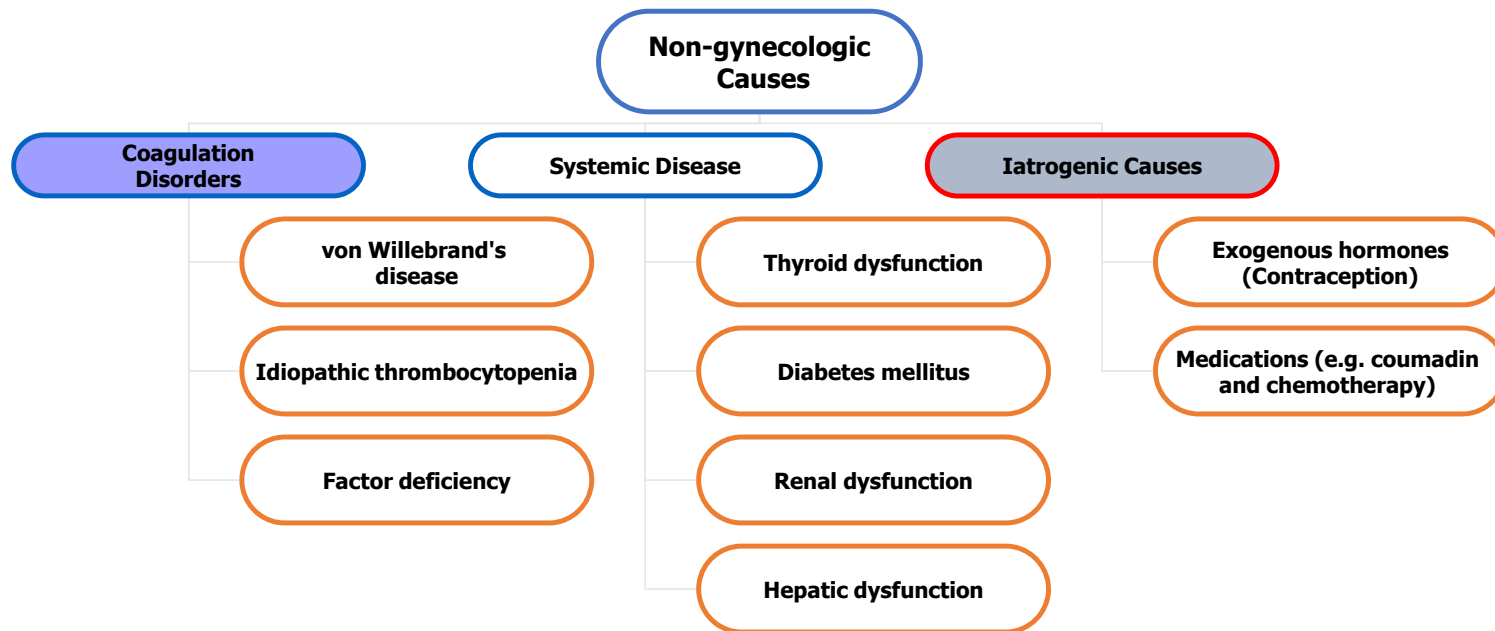
**C**oagulopathy  
**O**vulatory dysfunction  
**E**ndometrial  
**I**atrogenic (caused by doctor)  
**N**ot yet classified






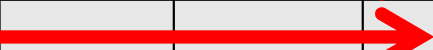

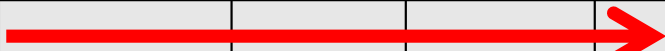



# Gynecologic Causes of Abnormal Bleeding in Adolescents



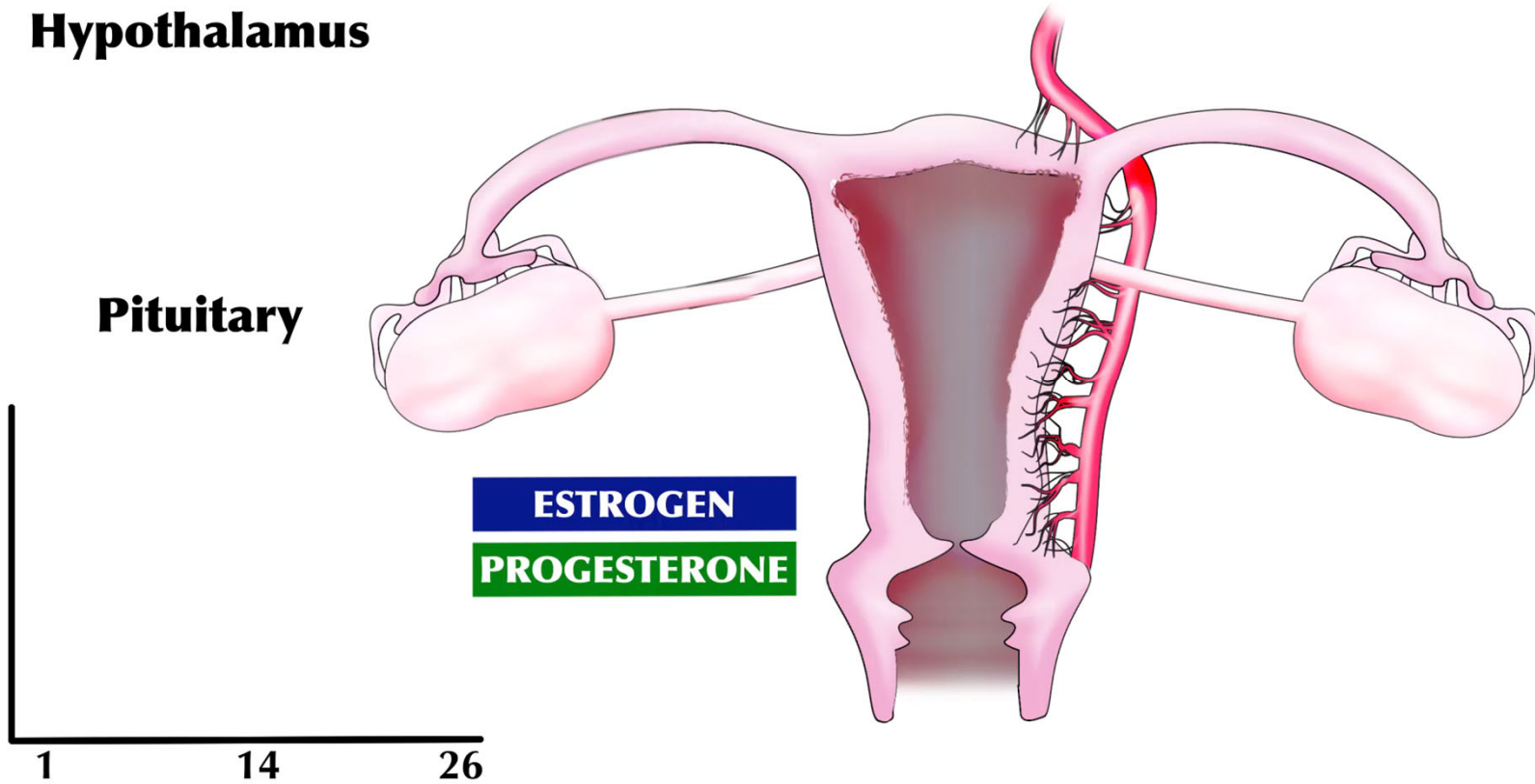
# Non-gynecologic Causes of Abnormal Bleeding in Adolescents



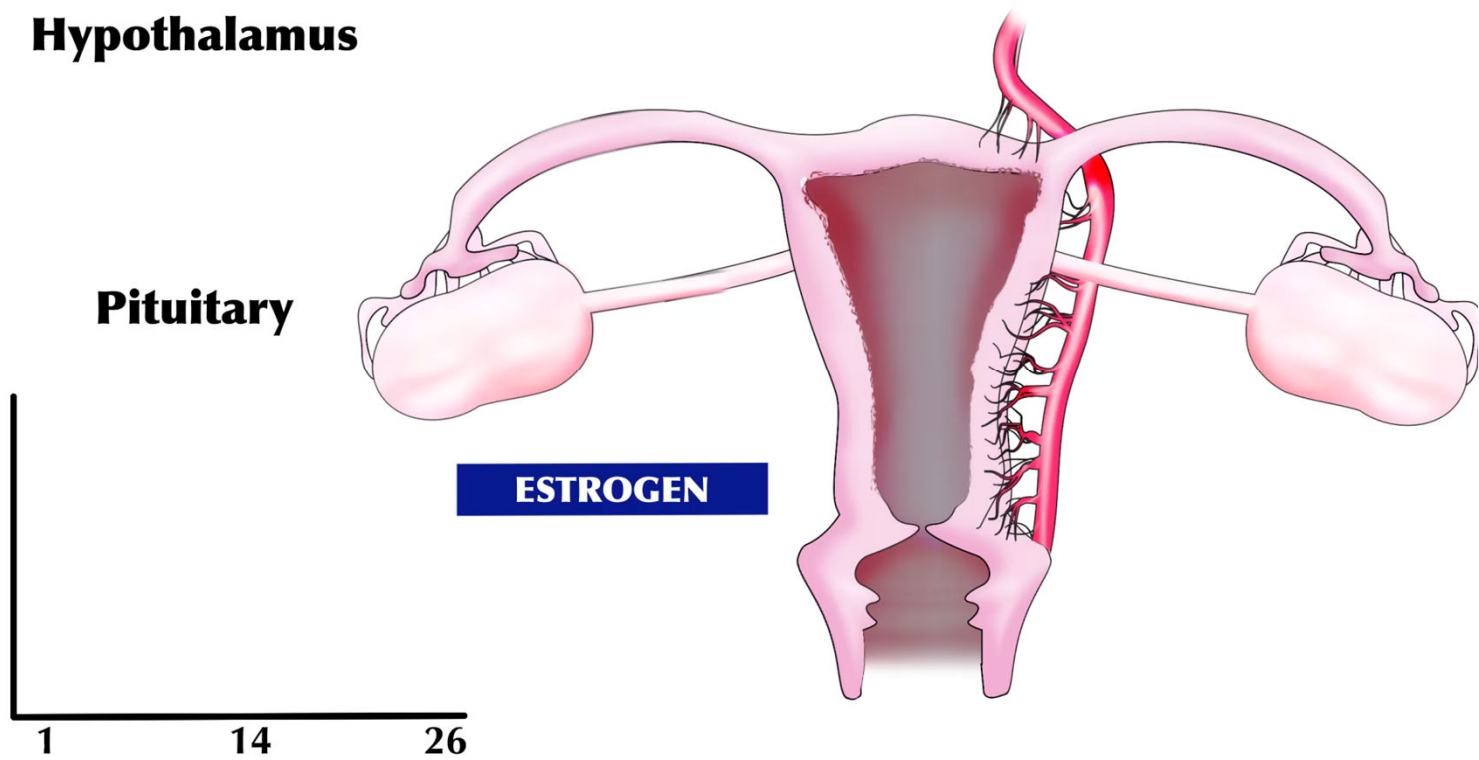
# Causes of Heavy Menstrual Bleeding by Age

Causes	Age 13-19	Age 20-34	Age 35-49	Age 50+
Adolescent anovulation				
Bleeding disorder				
Endometriosis				
Leiomyoma				
New systemic disease				
Post-op complication				
Anticoagulation therapy				
Hypothyroidism				
Perimenopausal anovulation				

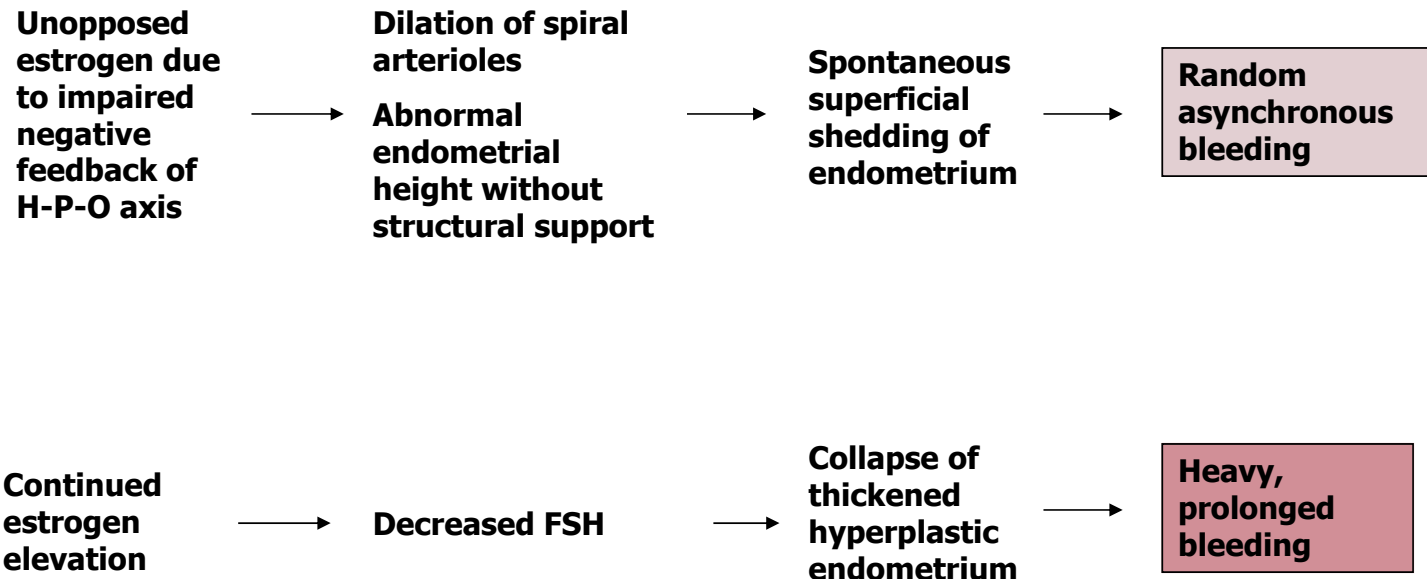
# Normal Menstrual Cycle



# Young Adolescent Cycles



# Abnormal Bleeding from Anovulation in Adolescents



# Endometriosis: Epidemiology

- True incidence is unknown, as there is often a 10 year delay between onset of symptoms and diagnosis of endometriosis.
- Up to 69-73% of adolescents who do not respond to medical treatment of dysmenorrhea and pelvic pain have been found to have endometriosis at laparoscopy



Stuparich A, Donnellan M, Sanfilippo J. Endometriosis in the Adolescent Patient. Semin ReproducMed. 2017; 35:102-109. Image used with permission.

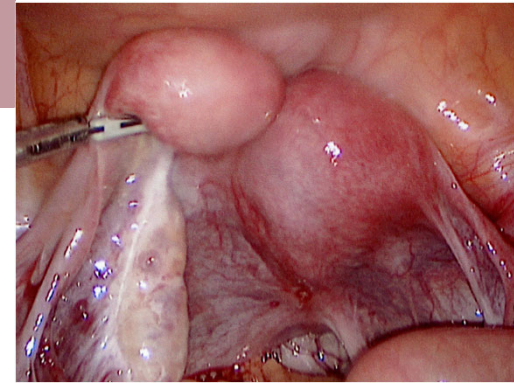
# Endometriosis is Hormonally Active and Different from Normal Tissue

## Normal Endometrium

- Does not express aromatase so cannot make estrogen
- Produces  $17\beta$ -hydroxysteroid dehydrogenase type 2 which inactivates estrogen
- Proliferative estrogen influence balanced by progesterone of the luteal phase

## Endometrium and endometrial implants of endometriosis

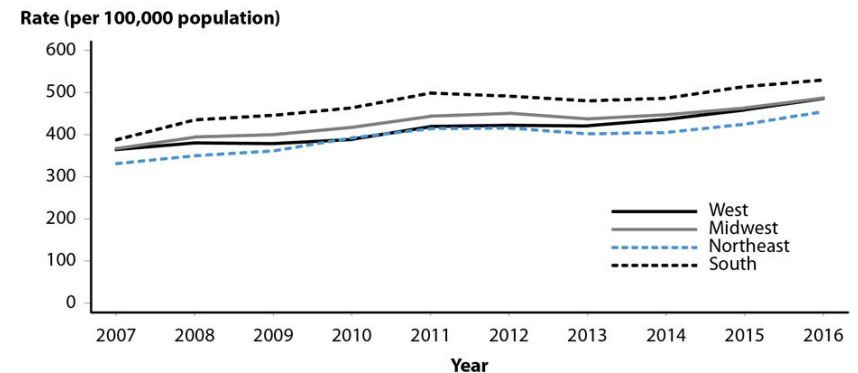
- Express aromatase and  $17\beta$ -hydroxysteroid dehydrogenase type 1 so they can make their own estrogen
- Lack  $17\beta$ -hydroxysteroid dehydrogenase type 2 so they perpetuate estrogen effect
- Resistant to progesterone
- Locally produced estrogen acts on the same tissue and cell as a stimulant





# Abnormal Uterine Bleeding and *Chlamydia trachomatis*

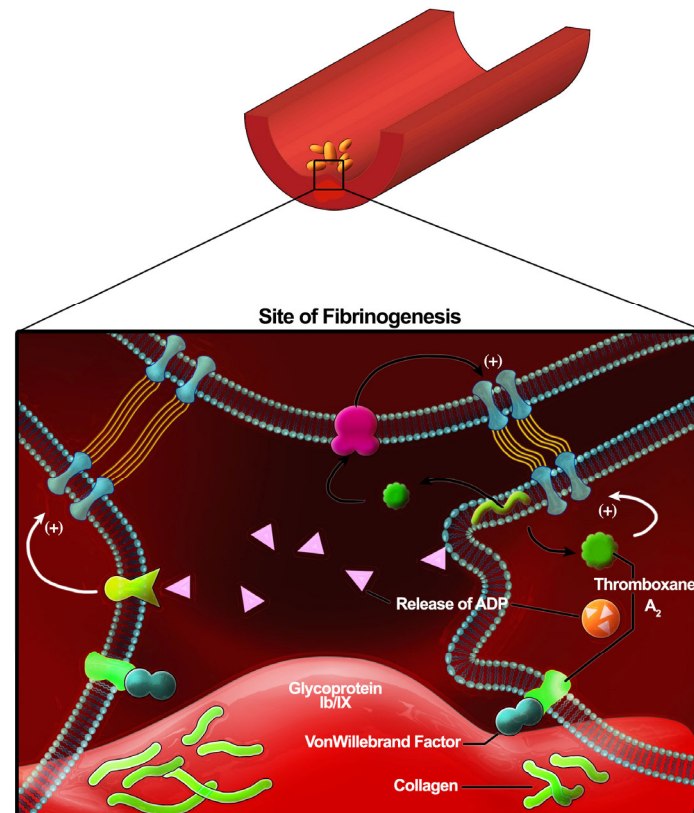
- Chlamydia rates are increasing with the highest prevalence in the US in the South (530/100,000). Second highest rates are in girls age 15-19 (3,071/100,00).<sup>1</sup>
- In 70% of cases, progression from lower genital tract to upper tract is asymptomatic.
- Toth et al studied 92 endometrial biopsy specimens from 2000 to 2003 from women age 16-46 with AUB
  - H&E staining for macrophages, PMNs, plasma cells and monoclonal antibody staining for *C. trachomatis* were done.
  - Chlamydia was found in 48% of samples, and was found in 58% of cases diagnosed with plasma cell endometritis.<sup>2</sup>



<https://www.cdc.gov/std/stats16/tables/3.htm>

# Brief Review of Platelet Aggregation

- **Von Willebrand's Factor**
  - Forms a bridge between the platelet wall and subendothelial space
  - Binds to Factor VIII to prevent degradation of Factor VIII and promote clotting
- **Glycoprotein Ib-IX-V Complex**
  - Binds von Willebrand factor on the subendothelial side
  - Important in high flow clot formation
- **Glycoprotein IIb-IIIa**
  - Forms fibrinogen-complex links to link platelets together



# Bleeding History Red Flags Warranting Screening

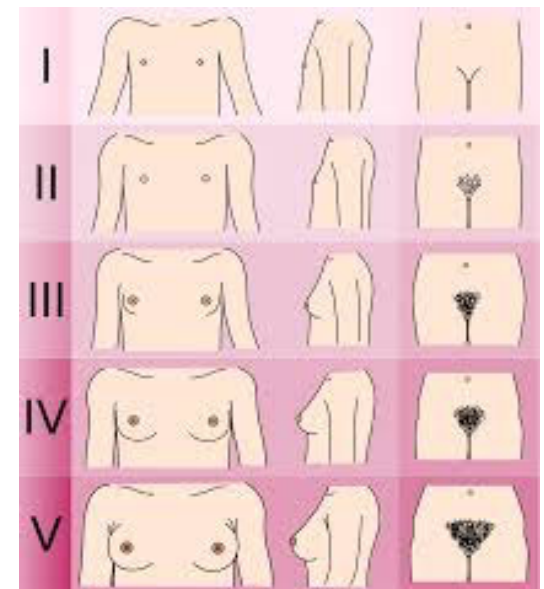
1. Prolonged bleeding from trivial wounds lasting more than 15 minutes, or recurring spontaneously within 7 days.
2. Heavy, prolonged, or recurrent bleeding after surgical procedures
3. Bruising with minimal or no trauma with a lump under the bruise.
4. Spontaneous nose bleeds lasting more than 10 minutes or needing medical attention.
5. Heavy, prolonged, or recurrent bleeding after dental extractions.
6. Blood in the stool unexplained by anatomic lesions such as stomach ulcers or colonic polyps.
7. Anemia requiring treatment or blood transfusion.
8. Heavy menses characterized by clots greater than an inch in diameter and/or changing a pad or tampon more than hourly, or resulting in anemia/low iron stores.
9. Blood relative with a bleeding disorder such as von Willebrand disease or hemophilia.

# It's (almost) all in the History

- Full menstrual history (age of menarche, how frequent her menses are, how long, how heavy, how many pads per day, for how many days has the current bleeding been present)
  - Any anemia symptoms,
  - H/o epistaxis, gum bleeding, easy bruising, family history of bleeding symptoms and bleeding disorders
  - Prior use of hormonal contraceptives, sexual activity (ask in private!)
  - Presence of significant dysmenorrhea
- Important aspects of PMH:
  - H/o migraines with aura, or DVT/PE
  - Liver disease, kidney disease, gall bladder disease
  - Use of seizure medication, h/o malignancy- current or in the past
- Psychosocial: HEADDDSS interview to assess for major stressors triggering bleeding

# Focused Physical Examination

- Vital signs: Include orthostatic pulse and blood pressure, BMI
- Skin: Pallor, bruising, petechiae, acanthosis nigricans, acne and hirsutism
- Neck: Thyroid
- Breasts: Tanner Staging
- Abdomen: Distention, striae, palpable mass
- External GU exam: Bleeding source, volume, trauma, sexual maturity
- It is not necessary perform internal pelvic exam, unless internal vaginal trauma/laceration is suspected by the history



# First Tier Lab testing

<b>Laboratory testing</b>	<b>Abnormality</b>
Pregnancy test	Disorders of pregnancy
CBC with differential	Anemia, microcytosis, thrombocytopenia
Ferritin	Iron Deficiency
Prothrombin time	Factor VII deficiency if prolonged
Activated Partial thromboplastin time	Factor VIII,IX, XI, XII deficiencies if prolonged, prolonged in VWD
Thrombin time/Fibrinogen	Hypofibrinogenemia, heparin contamination if prolonged
Von Willebrand Antigen	Deficiency in VonWillebrand Antigen production
Type and Screen/crossmatch if profoundly anemic	

# Second and Third Tier Lab testing

Laboratory testing	Abnormality
Second tier	
Chlamydia/Gonorrhea vaginal, cervical or urine testing	STIs
Thyroid stimulating hormone	Thyroid abnormality
vonWillebrand Profile: VW antigen, activity, ristocetin cofactor assay, factor VIII, multimer analysis	Von Willebrands Disease
Total and free testosterone, DHEAS, androstenedione	PCOS workup
Liver function tests	Liver disease causing coagulopathy
Third tier	
Platelet function and aggregation testing	Platelet aggregation and secretion disorders

# Ultrasound

- Can provide information about endometrial thickness
- Can look for Mullerian anomalies
- Leiomyoma are uncommon but do rarely occur in teens
- May identify an estrogen producing malignancy
- Data does not support that it changes management of heavy bleeding, so don't delay treatment waiting for results.





# Treatment of Anovulatory Bleeding in Adolescents

- If mild-moderate symptoms, start combined OC's
  - Use a monophasic with **at least 30 mcg of ethinyl estradiol** and preferably **levonorgestrel or norgestrel**
  - Counsel that the first menses on OC's will be heavy, then will get lighter in subsequent months
  - If HGB >11 g/dL, okay to start once daily
  - Use iron supplementation for first 2 months
    - Ferrous gluconate 325 mg



Haamid F, Sass A, Dietrich J. Heavy Menstrual Bleeding in Adolescents, *Pediatr Adolesc Gynecol* 30 (2017) 335e340; <http://dx.doi.org/10.1016/j.jpag.2017.01.002>

## Treatment of Anovulatory Bleeding (cont)

- If bleeding is heavy, but HGB 8-10 g/dL, but patient is hemodynamically stable:
  - Start oral contraceptives tid x 3 days, bid x 3 days, bid x 3 days, then qd for at least 21 days.
  - **Check Hgb before allowing a withdrawal bleed.**
  - If breakthrough occurs when weaned to qd, maintain at bid for 21 days. Allow bleed, then restart oral contraceptives.
  - Consider continuous oral contraceptive use
  - **Warn patient that the first bleed will be heavy.**
- Continue OC's for at least 6 months

# Treatment of Severe Anemia from Heavy Menstrual Bleeding

- Hospitalize patient if
  - Hemoglobin is less than 8 **or**
  - Patient has orthostatic hypotension, tachycardia **or**
  - Is actively bleeding heavily
- Volume expand with crystalloid
- **Transfuse ONLY for severe symptoms, not a HGB number** (these are healthy patients in general)
  - Limit transfusions in adolescent girls to avoid antibody production and future isoimmunization with hemolytic disease of the fetus in pregnancy.
  - Give one unit and check HGB. Don't automatically give 2 units.
  - In general, healthy adolescent girls can tolerate HGBs of 5-6 and recover well as long as the bleeding is stopped and iron therapy is initiated



# Hormonal Therapy for Acute Heavy Menstrual Bleeding

- 50 mcg EE/norgestrel
  - Can use every 6 hours to stop bleeding, then q8 hours x 3 days then bid
- If unable to tolerate po: Use IV Conjugated equine estrogen 25 mg if available every 4-6 hours for 4-6 doses.
  - Can stop bleeding 89% of the time after 3 doses
  - Switch to OC's when bleeding has stopped; continue OC's at least 6 months
  - Hemostatic on endothelial cells
  - Increases circulating factors VIII, VII and fibrinogen
- High dose estrogen causes nausea: Be kind! Give ondansetron for nausea.

## Hormonal Therapy for Acute Heavy Menstrual Bleeding (cont)

- If unable to tolerate estrogen or it is contraindicated:
  - Norethindrone acetate 5-10 mg po every 6 hours
  - Medroxyprogesterone 10-20 mg orally every 6-12 hours (max of 80 mg/day)
- Avoid Depo-Medroxyprogesterone
  - It can't be titrated!

# Antifibrinolytics

- Background:
  - Heavy menstrual bleeding is associated with an increase in local fibrinolysis due to elevated levels of endometrium derived plasmin and plasminogen activators
  - Plasmin activity is increased in menstrual fluid in women with menorrhagia compared to normal women and correlates with blood loss
- **Antifibrinolytics interfere with the ability of plasmin to lyse clots and decrease tissue plasminogen activator**
- **Tranexamic acid**
  - Safe to use even with combined oral contraceptives

# Use of Levonorgestrel IUD in Adolescents with Heavy Menses

- ACOG and AAP recommends use of IUDs in adolescents
- Risk of PID is increased only around time of insertion.
  - 0-2% risk if no infection is present
  - 0-5% risk if infection is present
  - Document chlamydia and gonorrhea results prior to insertion and treat infections
- The most studied IUD delivers 20 mcg/day directly to the endometrium. It is associated with greater reduction in menstrual blood loss (86-97%) than antifibrinolytic agents (40-50%), OCs (40-50%), and prostaglandin synthetase inhibitors (20-30%)<sup>1</sup>
- Shown to be effective reducing bleeding in postmenarchal girls with bleeding disorders<sup>2</sup>

1. Contraception 2007,75: S 152-S154, 2. JPAG 2017, 30: 479-483.



## Tips for insertion:

- Work with a hematologist if patient has underlying bleeding disorder
- Play music, consider cervical block

## Why I enjoy taking care of teens...



- They are often more open-minded than their parents
- They are interested in learning about their bodies
- They evolve from angst-filled 13 year-olds to strong, independent women.



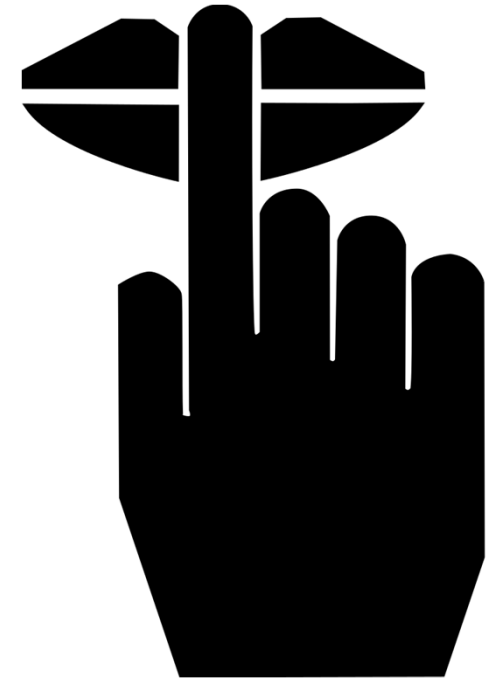
# Making your Office Adolescent Friendly: The New ACOG Adolescent Guide

- Contains:
  - Letter for Parents
  - Frequently asked questions from adolescents
    - Helpful for phone triage for nursing
  - Parent questionnaire
  - Guides for setting up an adolescent-friendly office
  - Confidentiality information
  - Tips for talking to teens

<https://www.acog.org/-/media/For-Patients/teen-page/Adolescent-Guide-2017-full.pdf?dmc=1&ts=20180622T1331224622>

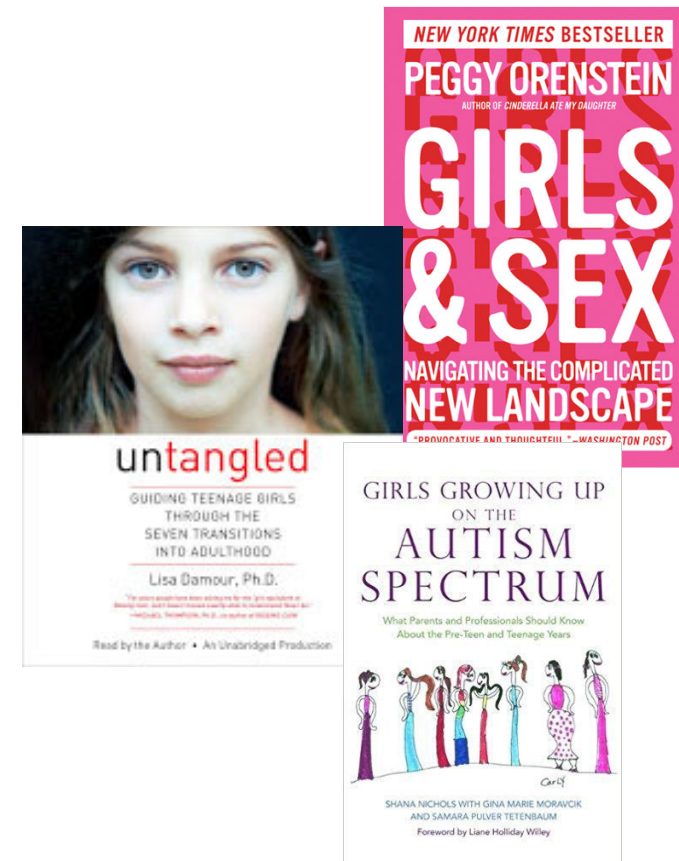
# Office Tips: Confidentiality

- EMR/Portal: Make sure it is secure for adolescent confidential information
  - E.g.: STI testing is confidential by law
- Medical Records
  - Outsourcing can lead to breakdown in confidentiality
- Get your adolescent's cell phone number into your patient note



# Helpful resources for patients and parents

- List of phone apps for menstrual cycle tracking
- Bedsider posters, handouts on contraception.
- Futures without Violence
  - Hanging out or hooking up? Dating safety.
  - Do you know how your relationship affects your health?
- Book list
  - Untangled, Lisa Damour
  - Girls and Sex, Peggy Orenstein
  - Girls Growing up on the Autism Spectrum



# Resources for you!

- ABOG's new PAG article selections for MOC
- NASPAG-Next annual meeting in New Orleans April 11-13, 2018
- Need a curbside consult?
  - [Judith.simms-cendan@ucf.edu](mailto:Judith.simms-cendan@ucf.edu)
  - 352-224-8108 (cell)



Thanks!