MERCYHEALTH

Diagnosis and Management of Vaginal Bleeding in the Adolescent Patient

Alicia Huckaby, DO

Pediatric Symposium April 25, 2025

Goals and Objectives

- Understand presentation of normal and abnormal vaginal bleeding in a pediatric patient
- Describe initial evaluation for adolescents with vaginal bleeding
- Review differential diagnosis for patients with vaginal bleeding
- Discuss hormonal and nonhormonal management options

Defining Normal

- During first few years after menarche due to inconsistent ovulation cycles vary
- Cycle length for adolescents:
  - 21 to 45 days
  - 2 to 7 days of menstrual bleeding
    - Over 7 days occurs in 2-11% of patients
- Adult cycle:
  - 28 to 35 days with 4-6 days of menstrual bleeding

Abnormal Uterine Bleeding: Definition

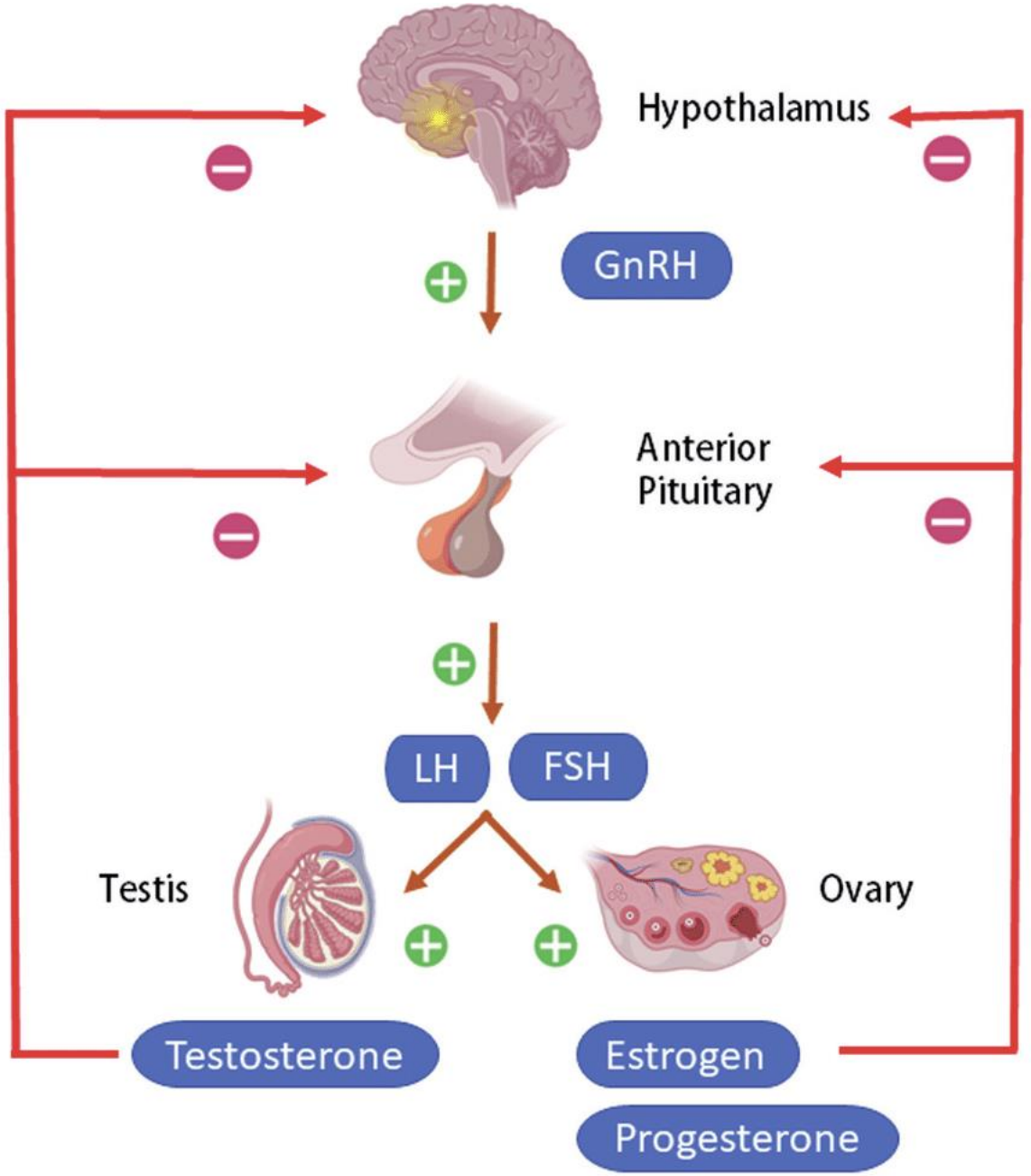
- Absence of menses
- Menses at irregular intervals
  - Less than every 21 days or more than every 45 days
- Menses that are excessive in duration (over 7 days)
- Heavy menstrual bleeding
- Intermenstrual or breakthrough bleeding

Classification

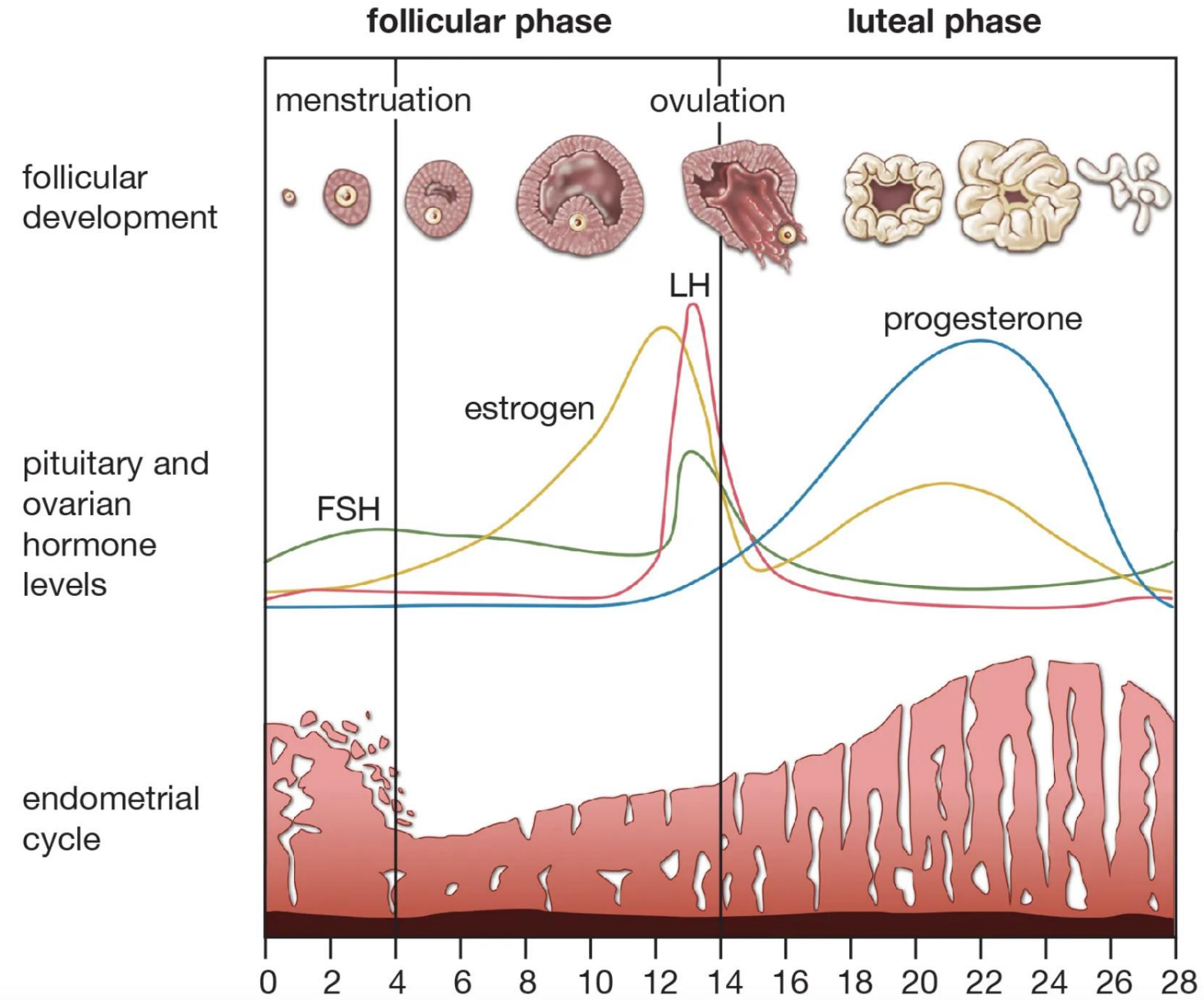
- Mild: longer than normal menses, or short cycles
  - Hemoglobin is normal or decreased but at least 10-12 g/dL
- Moderate: moderately prolonged, more frequent menses, moderate to heavy flow
  - Hemoglobin over 10 g/dL
- Severe: disruptive menstrual cycles with heavy bleeding that decreases hemoglobin to less than 10 g/dL and may have hemodynamic instability

Ovulatory Cycles

- The time that it takes to establish a normal ovulatory cycle increases with increasing age at time of menarche
  - 50% are ovulatory by one year with menarche <12 years
  - 50 % ovulatory by 3 years when menarche occurs between 12 and 13 years
  - 50% ovulatory by 5 years when menarche occurs at > 13 years
- Non-ovulatory cycles:
  - More irregular
  - Heavier
  - Can cause breakthrough bleeding
- Delay in ovulatory cycles secondary to dysfunction or slow maturation of the HPOA


Hypothalamus
GnRH
Anterior Pituitary
LH
FSH
Testis
Ovary
Testosterone
Estrogen
Progesterone

The menstrual cycle



Initial Evaluation

- Hemodynamic stability
- Pregnancy status

History

- Menstrual History
  - Age of menarche
  - Menstrual pattern
  - Events that coincided with change in menstrual pattern
- Sexual history
  - Use, type, and adherence to contraception
  - Number and characterization of partners
  - History of STI or symptoms of STI
  - History of sexual abuse
  - Recent delivery or abortion

ROS

- Bleeding symptoms- bruising, epistaxis, bleeding gums, postoperative bleeding
- Orthostatic symptoms
- Weight change
- Abdominal pain, fever, vaginal discharge
- Changes in bladder or bowel function
- Changes in hair, skin, or nails

Family History

- Bleeding disorders
- Menstrual disorders
- Endocrine disorders
- Leukemia and other cancers

Physical Exam

- Vitals
- Growth parameters
- Eyes
- Skin and Hair
- Neck
- Abdomen
- Tanner staging
- External genitalia
- Pelvic Examination

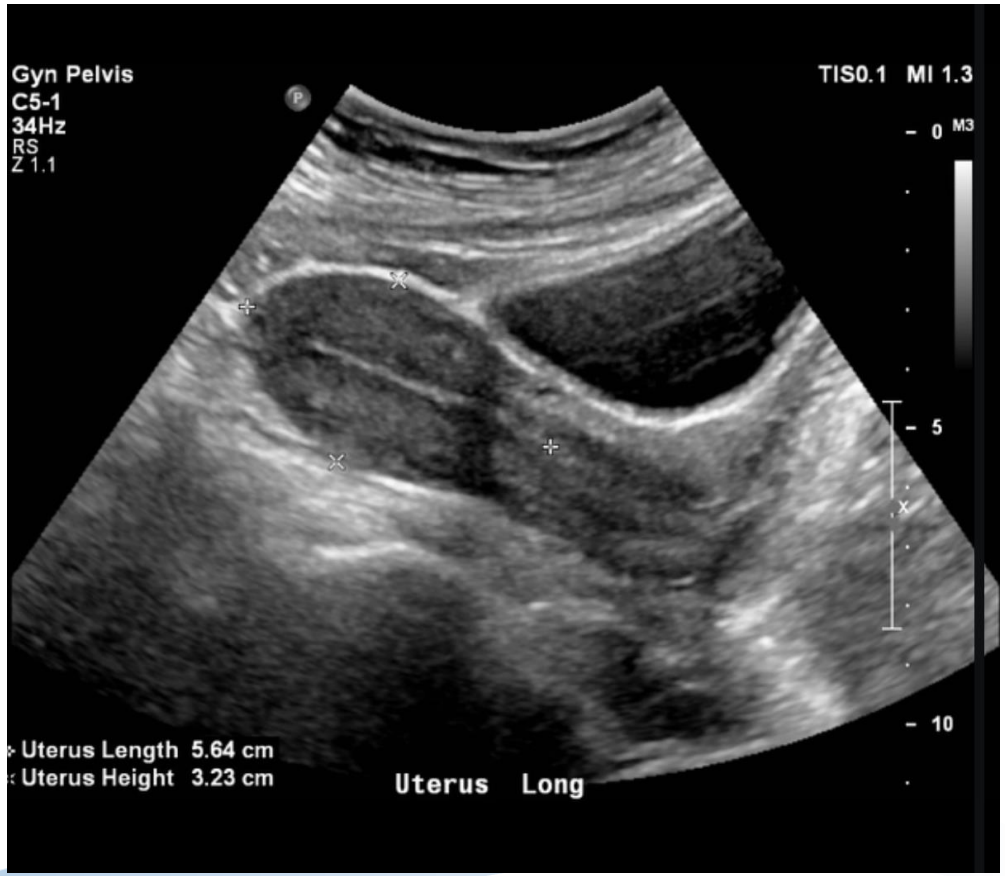
External genitalia	
Imperforate hymen	May be the cause of primary amenorrhea
Clitoromegaly	Hyperandrogenism (PCOS, CAH, androgen-secreting tumor, presence of Y chromosome)
Perineal trauma	Sexual abuse/assault
Vaginal discharge, genital ulcer, condyloma lata	Sexually transmitted infection
Pelvic examination	
Depth of vagina, presence of cervix, uterus, ovaries	Congenital vaginal or uterine anomalies
Uterine enlargement	Pregnancy or mass (eg, leiomyoma)
Ovarian enlargement	Ovarian cyst, possibly related to PCOS; ovarian mass

Laboratory evaluation

- Pregnancy test
- CBC
- TSH
- Screen for STIs if sexually active
- Consider prolactin

Imaging

- Pelvic US
  - Can do Transabdominal or Transvaginal



Irregular Bleeding

Causes	Clinical Features	Evaluation
Anovulatory Uterine bleeding due to immature HPO axis	- First year or two after menarche - Absence of premenstrual symptoms - Absence of clinical features associated with other causes	Diagnosis of Exclusion
PCOS	- Hyperandrogenism - Obesity	***
Hypo or Hyperthyroidism	- Recent weight gain or loss - Heat or cold intolerance - Family history	TSH
Hyperprolactinemia	Galactorrhea, HA, visual changes	Prolactin
Hypothalamic dysfunction	- Poor nutrition - Intense exercise - Psychosocial stress	FSH LH
Intermittent nonuterine bleeding mimicking irregular menses	- Variable	Exam

Regular Menses with excessive flow

Cause	Clinical Findings	Evaluation
Bleeding disorder	- Heavy bleeding with first period - Symptoms of bleeding disorder - Family history	- CBC with platelets - Eval of peripheral blood smear - aPTT and PT - Von Willebrand panel
Medications that affect hemostasis	Anticoagulants	
Structural lesions	- Often asymptomatic - May have pelvic pain and pressure	Pelvic US

Regular menses with intermenstrual bleeding

Cause	Clinical Features	Evaluation
Hormonal contraception or IUD	Recent initiation or poor adherence	
STI	- Sexual activity - Vaginal discharge - Vulvar lesions - Post-coital bleeding	Test for STIs

Extrauterine causes

Cause	Clinical Features	Evaluation
Ectropion	Exam findings	Exam
Perineal trauma	History of trauma or abuse	Exam
Cervical polyps	Chronic inflammation of cervical canal	Exam

Management

Goals

- Establish and maintain hemodynamic stability
- Correction of acute or chronic anemia
- Return to a pattern of normal menstrual cycle s
- Prevention of recurrence

Acute Management

- Mild:
  - Observation and reassurance
  - Contraception
  - Iron supplementation if hemoglobin is under 12\
  - Encourage menstrual calendar

Acute Management

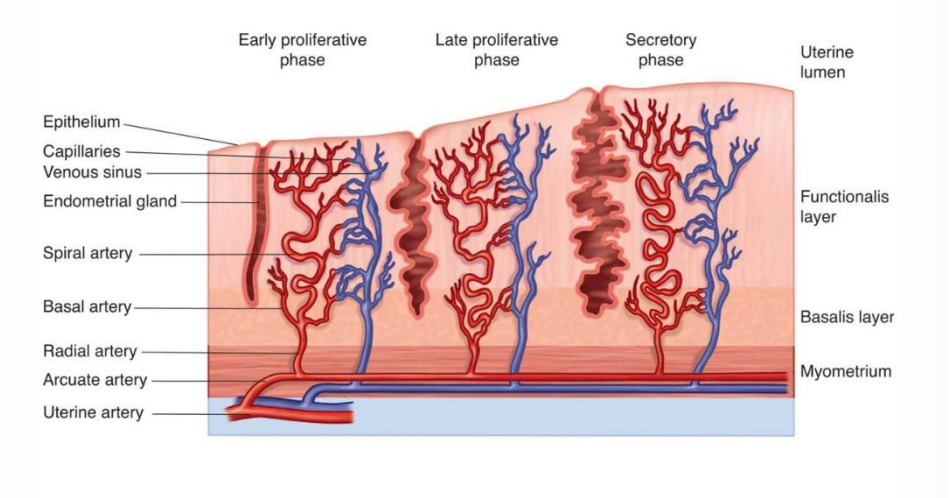
- Moderate
  - Hormonal therapy
  - TXA
  - Iron supplementation

Acute Management

- Severe
  - Hospitalization if actively bleeding, hemodynamically unstable, symptomatic anemia
  - IV estrogen
    - 25 mg every 4-6 hours until bleeding stops
  - Transfusion as needed
  - TXA, aminocaproic acid, desmopressin
  - Von Willebrand evaluation
  - Surgical management with D&C

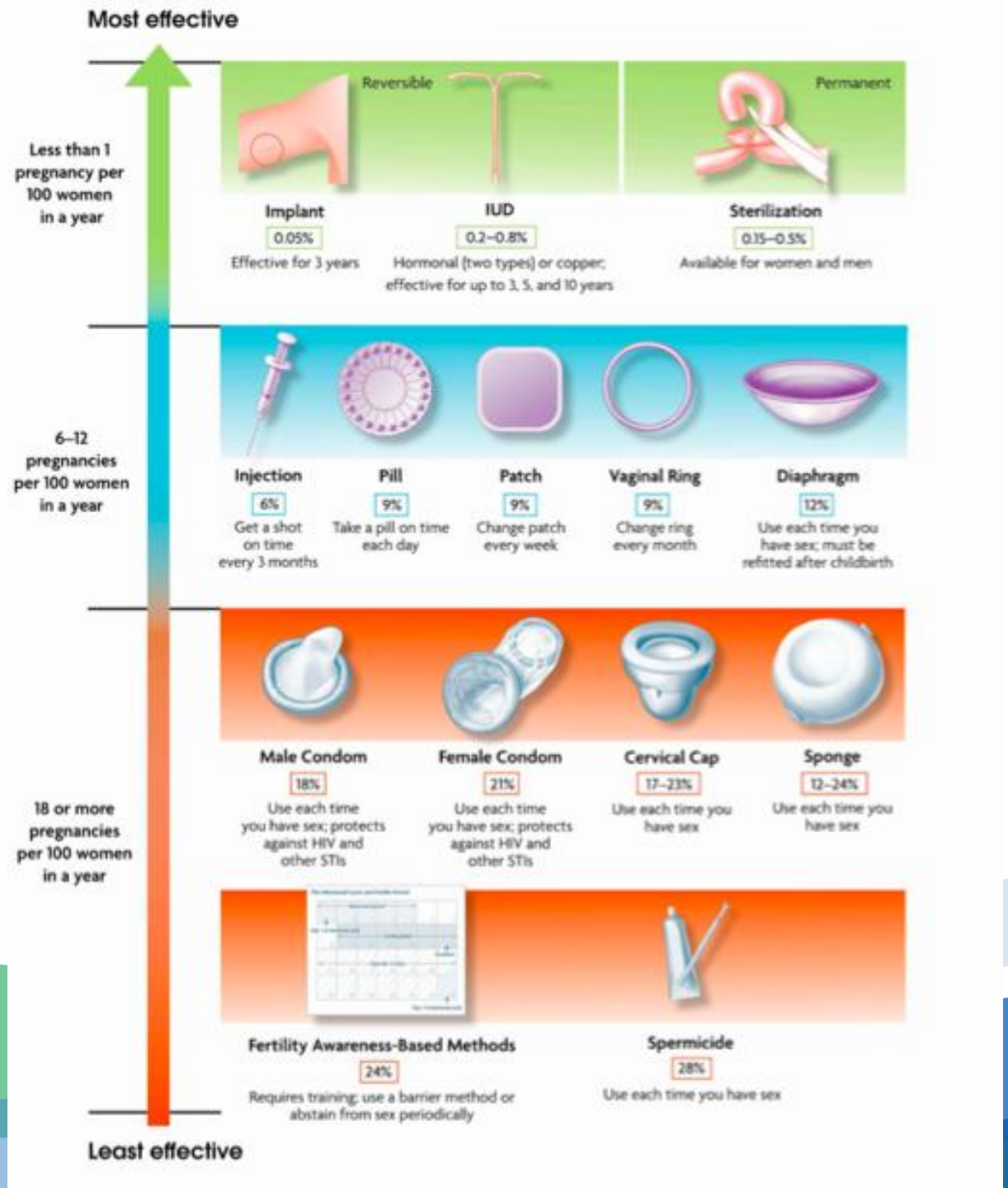
How do hormones work?

- Bleeding occurs when endometrium proliferates beyond the ability of endogenous estrogen to maintain the integrity of the endometrium
- Addition of exogenous estrogen permits additional endometrial proliferation which heals sites of endometrial bleeding and improves hemostasis
- Administration of progestin stabilizes the endometrial lining



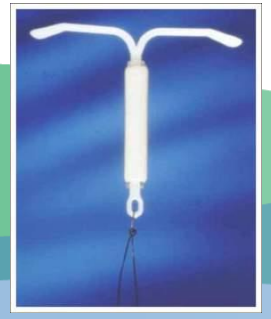
Hormonal Options that are NOT Birth Control

- Progestin only:
  - Norethindrone acetate 5 mg nightly for the first 5 to 10 days of each calendar month
  - Micronized progesterone 200 mg nightly for first 12 days of each calendar month
  - Medroxyprogesterone acetate 10 mg night for first 10 days of each calendar month

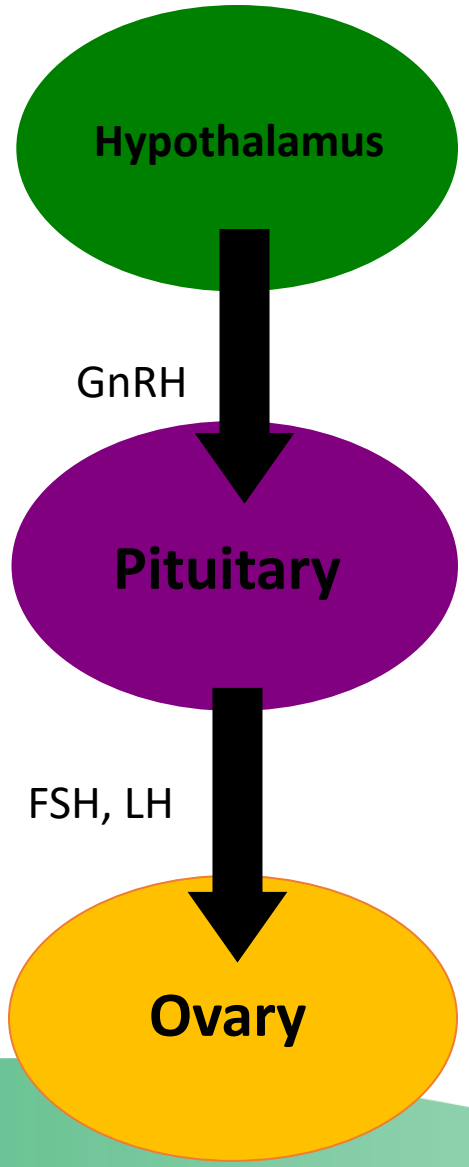

Most effective
Less than 1 pregnancy per 100 women in a year
6–12 pregnancies per 100 women in a year
18 or more pregnancies per 100 women in a year
Least effective
Reversible
Permanent
Implant
0.05%
Effective for 3 years
IUD
0.2–0.8%
Hormonal (two types) or copper; effective for up to 3, 5, and 10 years
Sterilization
0.15–0.5%
Available for women and men
Injection
6%
Get a shot on time every 3 months
Pill
9%
Take a pill on time each day
Patch
9%
Change patch every week
Vaginal Ring
9%
Change ring every month
Diaphragm
12%
Use each time you have sex; must be refitted after childbirth
Male Condom
18%
Use each time you have sex; protects against HIV and other STIs
Female Condom
21%
Use each time you have sex; protects against HIV and other STIs
Cervical Cap
17–23%
Use each time you have sex
Sponge
12–24%
Use each time you have sex
Fertility Awareness-Based Methods
24%
Requires training; use a barrier method or abstain from sex periodically
Spermicide
28%
Use each time you have sex

Intrauterine device (IUD)

- Levonorgestrel IUS (Mirena®, Kyleena®, Liletta®, Skyla®)
  - Approved for 8 years, 8 years, 7 years and 3 years of use, respectively for contraception
    - May need to exchange at 5 years, 5 years, 4 years, and 3 years
    - Skyla likely not as good of a choice
  - Common side effects
    - Irregular bleeding, amenorrhea
  - May improve dysmenorrhea, menorrhagia, protection against endometrial cancer
  - Placement likely needs to be under anesthesia



- Copper IUD (Paragard®)
  - Not appropriate in the setting of abnormal vaginal bleeding
  - Causes an increase in vaginal bleeding



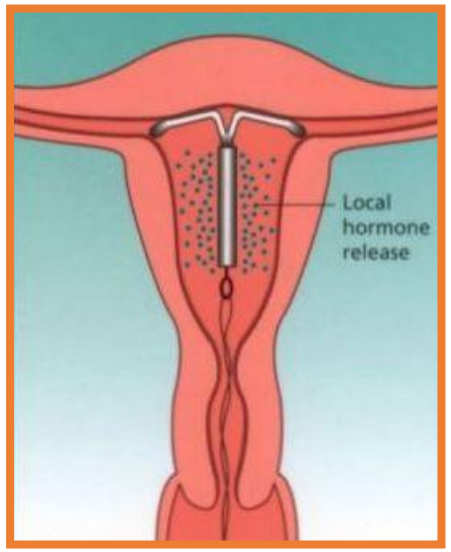
E2, P

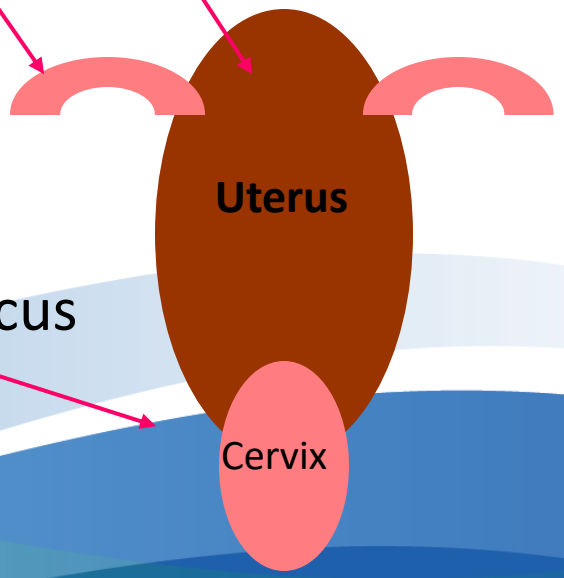
Ovulation

1. Thickens cervical mucus

2. Decreases tubal motility

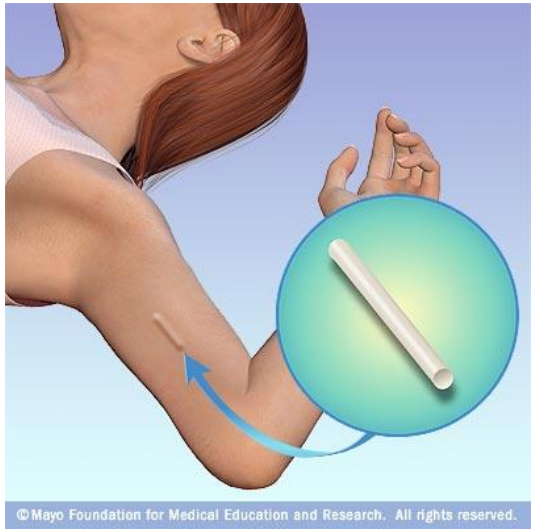
3. Atrophic endometrium





Implant

- Etonorgestrel implant (Nexplanon®)
  - Approved for 3 years of use
  - Does not require cervico-vaginal procedure
  - Common side effects
    - Irregular bleeding, amenorrhea
  - Obesity affect?



Hypothalamus

GnRH

Pituitary

FSH, LH

Ovary

E2, P

Ovulation

1. Ovulation inhibition

2. Decreases tubal motility

3. Thickens cervical mucus

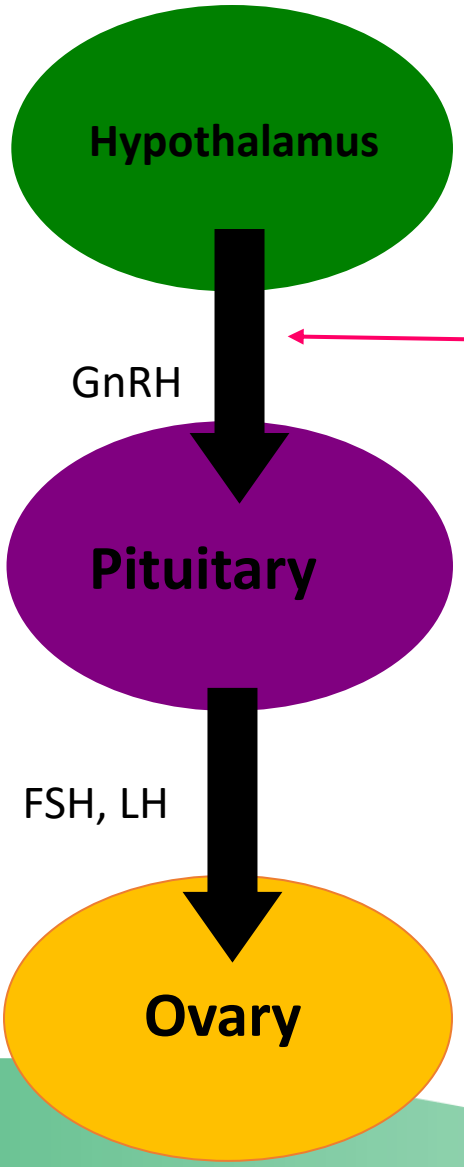
4. Atrophic endometrium

Uterus

Cervix

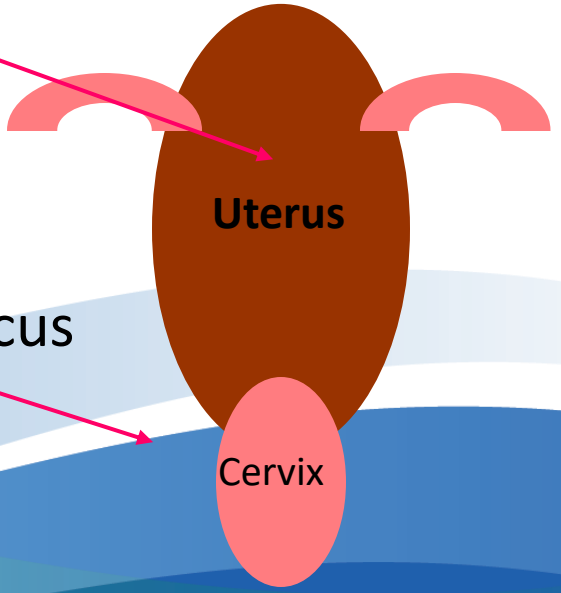
Injectables

- Depot medroxyprogesterone acetate (Depo-Provera®)
  - Intramuscular (150mg) or subcutaneous injection (104mg) every 3 months.
  - Common side effects
    - Irregular bleeding, amenorrhea, weight gain, possible delayed return to normal menses
  - Bone mineral density effects?
  - Obesity affect?



1. Ovulation inhibition

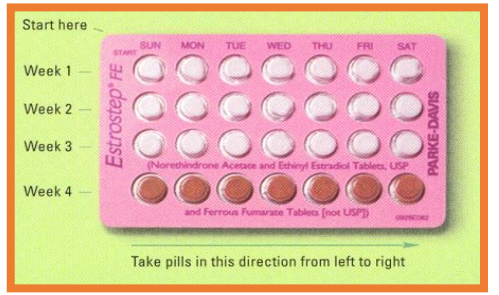
2. Atrophic endometrium

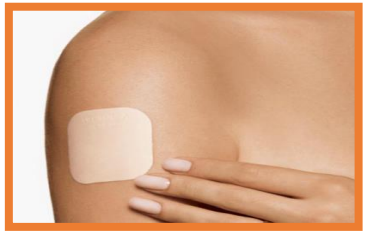


3. Thickens cervical mucus

Combined hormonal contraception

- Estrogen and progesterone components
- Combined oral contraceptive pills
  - Daily use
- Patch (OrthoEvra®)
  - Weekly use
- Ring (Nuvaring®)
  - 1 ring for 3 weeks
- Common side effects
  - Possible breakthrough bleeding
- Benefits
  - Improved hirsutism and acne, improved dysmenorrhea, protection against ovarian, endometrial and colon cancers





Hypothalamus

GnRH

Pituitary

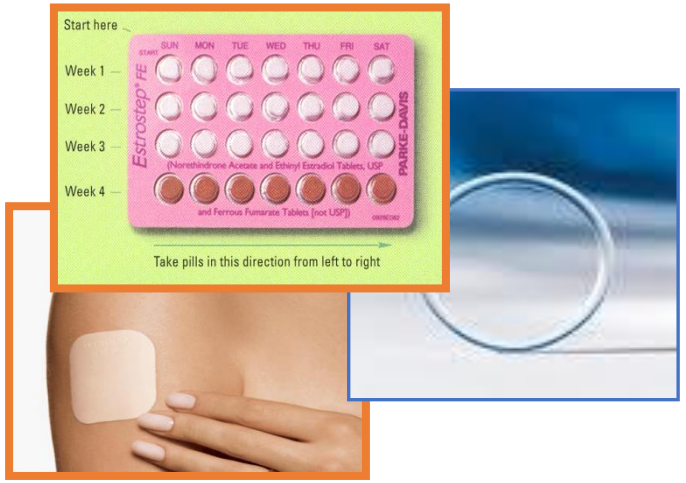
FSH, LH

Ovary

E2, P

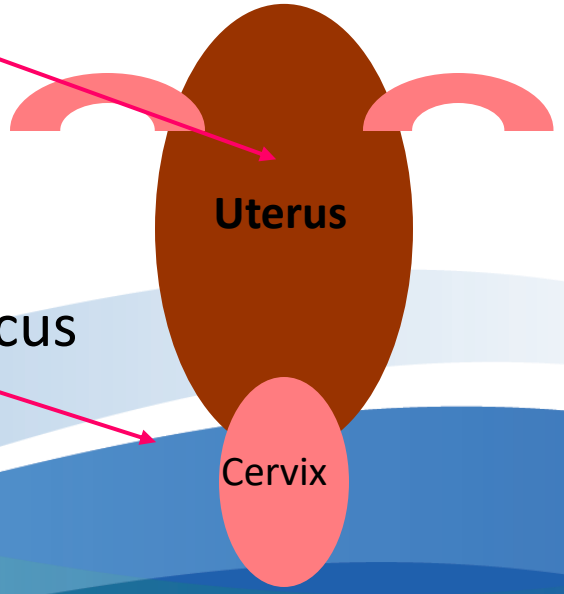
Ovulation

1. Ovulation inhibition



2. Atrophic endometrium

3. Thickens cervical mucus



Estrogen-containing Contraceptives

- Increased risk of thrombogenesis in women with risk factors
  - CHC risk: 1.0–3.0 per 10,000 women per year
  - Pregnancy risk: 5.9 per 10,000 women per year
- Risk is elevated in first 3 months of use

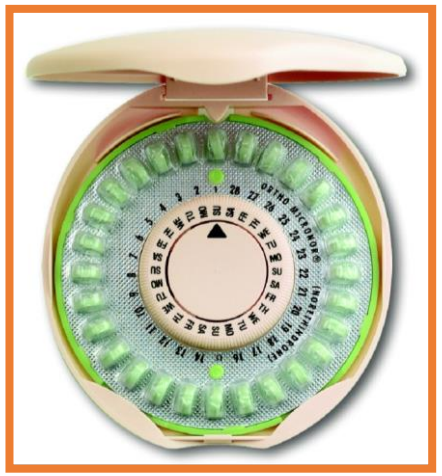
Contraindications for CHC Use

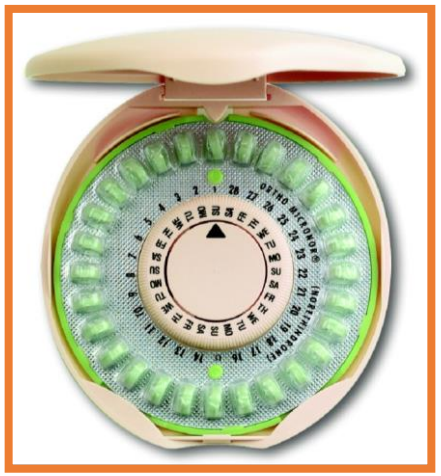
- Multiple risk factors for arterial cardiovascular disease
  - Older age (≥ 35 years)
  - Smoking (>15 cigarettes/day)
  - Hypertension (systolic ≥160 or diastolic ≥ 100)
  - Diabetes
- Known thrombogenic mutations, history of or current DVT or PE
- Current or history of ischemic heart disease, complicated valvular heart disease, vascular disease
- History of stroke
- Migraine headache with aura
- Major surgery with prolonged immobilization
- Current breast cancer
- Active viral hepatitis, severe cirrhosis, benign or malignant liver tumors
- Breastfeeding, <6 weeks postpartum

Progestin-only pill

- Daily use
- Dose low, must be used about the same time every day
- No placebo pill → No withdrawal bleed

- Common side effects
  - Breakthrough bleeding





Hypothalamus

GnRH

Pituitary

FSH, LH

Ovary

+/-

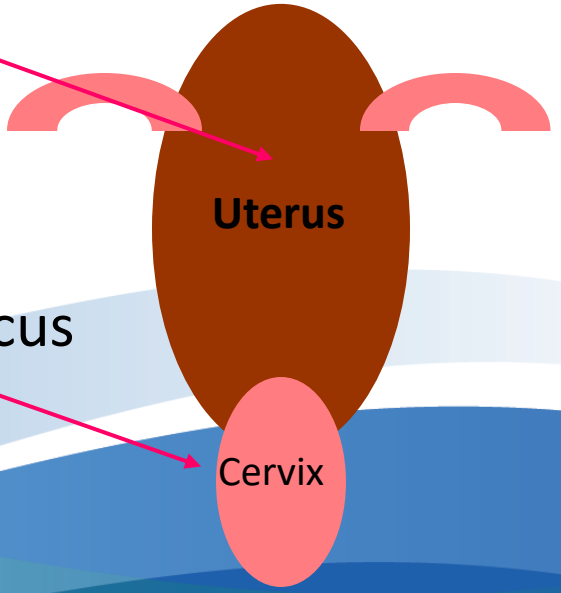
3. Ovulation inhibition

2. Atrophic endometrium

E2, P

Ovulation

1. Thickens cervical mucus



Initiation of COCs

- Quick start method: begin taking pill on the day that the prescription is given
- Sunday start: starts the pill on the first Sunday after her period
- With either method patient should use back up method for first seven days of use
- Follow up in 3 months to monitor bleeding
  - Do not give in to cycle of changing method too frequently

Missed Pills in setting of Sexual Activity

- Single pill: take the missed pill as soon as possible and then continued taking as prescribed. May end up taking two pills on the same day.
  - Do not need back up method
- Two or more pills:
  - If during the first week use emergency contraception to decrease risk of pregnancy
  - If during the last week of hormone pills (week 3) finish that last week then skip placebos and immediately move on to a new pill pack.
  - Back up contraception should be used for 7 days

Which pill to use?

- Monophasic vs Multiphasic
  - Mono: contain same dose of estrogen and progesterone, 21-24 active pills
  - Multi: pills vary the dose of either or both hormones during the active pill phase
    - Lower hormone doses , should decrease hormone-related side effects and breakthrough bleeding
      - Biphasic may have more breakthrough bleeding than triphasic
- Cyclic or Continuous
  - Cyclic: 21 days active pill then 7 days placebo that results in withdrawal bleed or 24/4
  - Continuous: Take pills for any period of time continuously, skip placebo

Summary Chart of U.S. Medical Eligibility Criteria for Contraceptive Use

Condition	Sub-Condition	CHC		POP		Injection		Implant		LNG-IUD		Cu-IUD	
		I	C	I	C	I	C	I	C	I	C	I	C
Age		Menarche to <40=1		Menarche to <18=1		Menarche to <18=2		Menarche to <18=1		Menarche to <20=2		Menarche to <20=2	
		≥40=2		18-45=1		18-45=1		18-45=1		≥20=1		≥20=1	
				>45=1		>45=2		>45=1					
Anatomic abnormalities	a) Distorted uterine cavity									4		4	
	b) Other abnormalities									2		2	
Anemias	a) Thalassemia	1		1		1		1		1		2	
	b) Sickle cell disease‡	2		1		1		1		1		2	
	c) Iron-deficiency anemia	1		1		1		1		1		2	
Benign ovarian tumors	(*including cysts*)	1		1		1		1		1		1	
Breast disease	a) Undiagnosed mass	2*		2*		2*		2*		2		1	
	b) Benign breast disease	1		1		1		1		1		1	
	c) Family history of cancer	1		1		1		1		1		1	
	d) Breast cancer‡												
	i) current	4		4		4		4		4		1	
	ii) past and no evidence of current disease for 5 years	3		3		3		3		3		1	
Breastfeeding (*see also Postpartum*)	a) <1 month postpartum	3*		2*		2*		2*					
	b) 1 month or more postpartum	2*		1*		1*		1*					
Cervical cancer	Awaiting treatment	2		1		2		2		4	2	4	2
Cervical ectropion		1		1		1		1		1		1	
Cervical intraepithelial neoplasia		2		1		2		2		2		1	
Cirrhosis	a) Mild (*compensated*)	1		1		1		1		1		1	
	b) Severe‡ (*decompensated*)	4		3		3		3		3		1	
Deep venous thrombosis (DVT)/Pulmonary embolism (PE)	a) History of DVT/PE, not on anticoagulant therapy												
	i) higher risk for recurrent DVT/PE	4		2		2		2		2		1	
	ii) lower risk for recurrent DVT/PE	3		2		2		2		2		1	
	b) Acute DVT/PE	4		2		2		2		2		2	
	c) DVT/PE and established on anticoagulant therapy for at least 3 months												
	i) higher risk for recurrent DVT/PE	4*		2		2		2		2		2	
	ii) lower risk for recurrent DVT/PE	3*		2		2		2		2		2	
	d) Family history (*first-degree relatives*)	2		1		1		1		1		1	
	e) Major surgery												
	i) with prolonged immobilization	4		2		2		2		2		1	
	ii) without prolonged immobilization	2		1		1		1		1		1	
	f) Minor surgery without immobilization	1		1		1		1		1		1	
Depressive disorders		1*		1*		1*		1*		1*		1*	
Diabetes mellitus (DM)	a) History of gestational DM only	1		1		1		1		1		1	
	b) Non-vascular disease												
	i) non-insulin dependent	2		2		2		2		2		1	
	ii) insulin dependent‡	2		2		2		2		2		1	
	c) Nephropathy/retinopathy/neuropathy‡	3/4*		2		3		2		2		1	
	d) Other vascular disease or diabetes of >20 years' duration‡	3/4*		2		3		2		2		1	

Condition	Sub-Condition	CHC		POP		Injection		Implant		LNG-IUD		Cu-IUD	
		I	C	I	C	I	C	I	C	I	C	I	C
Endometrial cancer‡		1		1		1		1		4	2	4	2
Endometrial hyperplasia		1		1		1		1		1		1	
Endometriosis		1		1		1		1		1		2	
Epilepsy‡	(*see also Drug Interactions*)	1*		1*		1*		1*		1		1	
Gallbladder disease	a) Symptomatic												
	i) treated by cholecystectomy	2		2		2		2		2		1	
	ii) medically treated	3		2		2		2		2		1	
	iii) current	3		2		2		2		2		1	
	b) Asymptomatic	2		2		2		2		2		1	
Gestational trophoblastic disease	a) Decreasing or undetectable ß-hCG levels	1		1		1		1		3		3	
	b) Persistently elevated ß-hCG levels or malignant disease‡	1		1		1		1		4		4	
Headaches	a) Non-migrainous	1*	2*	1*	1*	1*	1*	1*	1*	1*	1*	1*	
	b) Migraine												
	i) without aura, age <35	2*	3*	1*	2*	2*	2*	2*	2*	2*	2*	1*	
	ii) without aura, age ≥35	3*	4*	1*	2*	2*	2*	2*	2*	2*	2*	1*	
	iii) with aura, any age	4*	4*	2*	3*	2*	3*	2*	3*	2*	3*	1*	
History of bariatric surgery‡	a) Restrictive procedures	1		1		1		1		1		1	
	b) Malabsorptive procedures	COCs: 3 P/R: 1		3		1		1		1		1	
History of cholestasis	a) Pregnancy-related	2		1		1		1		1		1	
	b) Past COC-related	3		2		2		2		2		1	
History of high blood pressure during pregnancy		2		1		1		1		1		1	
History of pelvic surgery		1		1		1		1		1		1	
Human immunodeficiency virus (HIV)	High risk	1		1		1*		1		2	2	2	2
	HIV infected (*see also Drug Interactions*)‡	1*		1*		1*		1*		2	2	2	2
	AIDS (*see also Drug Interactions*)‡	1*		1*		1*		1*		3	2*	3	2*
	Clinically well on therapy	*If on treatment, see Drug Interactions*								2	2	2	2
Hyperlipidemias		2/3*		2*		2*		2*		2*		1*	
Hypertension	a) Adequately controlled hypertension	3*		1*		2*		1*		1		1	
	b) Elevated blood pressure levels (*properly taken measurements*)												
	i) systolic 140-159 or diastolic 90-99	3		1		2		1		1		1	
	ii) systolic ≥160 or diastolic ≥100‡	4		2		3		2		2		1	
	c) Vascular disease	4		2		3		2		2		1	
Inflammatory bowel disease	(*Ulcerative colitis, Crohn's disease*)	2/3*		2		2		1		1		1	

Abbreviations: C=continuation of contraceptive method; CHC=combined hormonal contraceptive (pill, patch, and ring); COC=combined oral contraceptive; Cu-IUD=copper-containing intrauterine device; I=initiation of contraceptive method; LNG-IUD=levonorgestrel-releasing intrauterine device; NA=not applicable; POP=progestin-only pill; P/R=patch/ring.

Legend:

1	No restriction (*method can be used*)	3	Theoretical or proven risks usually outweigh the advantages
2	Advantages generally outweigh theoretical or proven risks	4	Unacceptable health risk (*method not to be used*)

Centers for Disease Control and Prevention
National Center for Chronic Disease Prevention and Health Promotion

References

- Morrell, KM., et al. (2016). Relationship between etonogestrel level and BMI in women using the contraceptive implant for more than 1 year. Contraception 93(3): 263-265.
- Depot medroxyprogesterone acetate and bone effects. Committee opinion No. 602. American college of obstetricians and gynecologists. Obstet Gynecol 2014; 123:1398-402.
- Westhoff, C., et al. (2007). Changes in weight with depot medroxyprogesterone acetate subcutaneous injection 104 mg/0.65 mL. Contraception 75(4): 261-267.
- Thromboembolism in pregnancy. Practice bulletin No. 123. American College of Obstetricians and Gynecologists. Obstet Gynecol 2011;118:718-29.

MERCYHEALTH

Thank you!