

UC San Diego Health

Polycystic Ovarian Syndrome: Evaluation & Treatment

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I am a Nexplanon speaker and trainer for Merck/Organon.

CASE: POLLY

15yo Polly presents to you for the first time for her wellness exam. No outside records, nothing in the EMR.

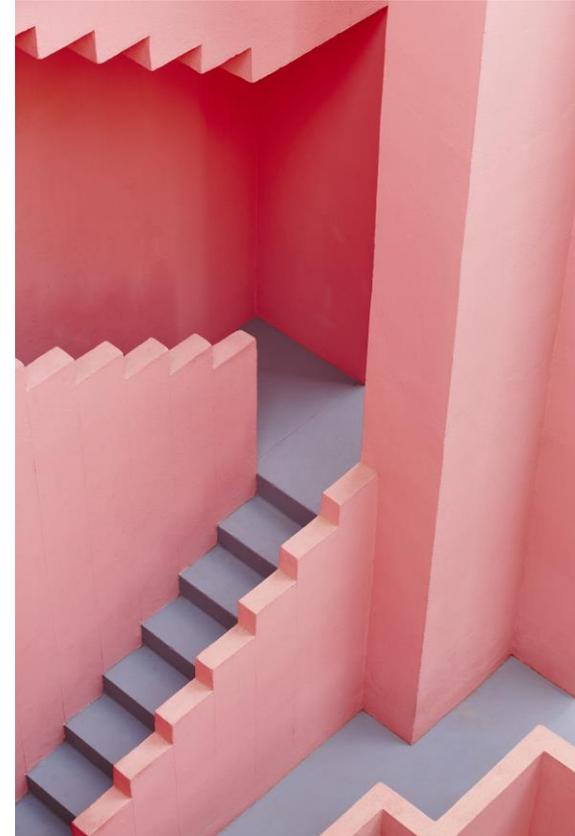
- PMH: None
- PSH: None
- Fam Hx: Depression, HTN, Hypercholesterolemia, Obesity.
- Meds: None
- Allergies: NKDA
- Gyn Hx:
 - Menarche: 11 yo, gyn age 4 years
 - LMP: 4 months ago
 - PMP: ?maybe 5-6 months prior to that?
 - Duration: 10-14 days
 - Dysmenorrhea: None
 - Flow: 5-8 heavy days, 5-9 medium to light days, some large clots.
- Maternal Hx: irregular and prolonged menses, delayed pregnancy (3 years)
- Soc Hx/HEADSS: Only child, lives with mom + dad, no smokers or guns; 10th grade, B-student; likes video games and playing on her phone (>3 hrs/day); no substance use; identifies as female and uses “she/hers”; negative coitarche, no abuse or bullying.



Case: Polly

- Vital signs: BMI is 31 (>95th pc), HR 82, BP 119/72
- ROS: No HA, lightheadedness, fatigue, thirst, polyuria, abdominopelvic pain, no nipple discharge. +Acne, doesn't like waxing all the time.
- PE: abdominal adiposity, facial acne, terminal hair (upper lip, chin, upper + lower back, abdomen), and acanthosis nigricans (nape of neck, axillae, umbilicus). No thyromegaly, frontal bossing or acromegaly, SMR 5 breasts - no galactorrhea. Declined GU exam.
- Labs: Hgb in office is 11.4 g/dL. POC Upreg negative.

NEXT STEP?



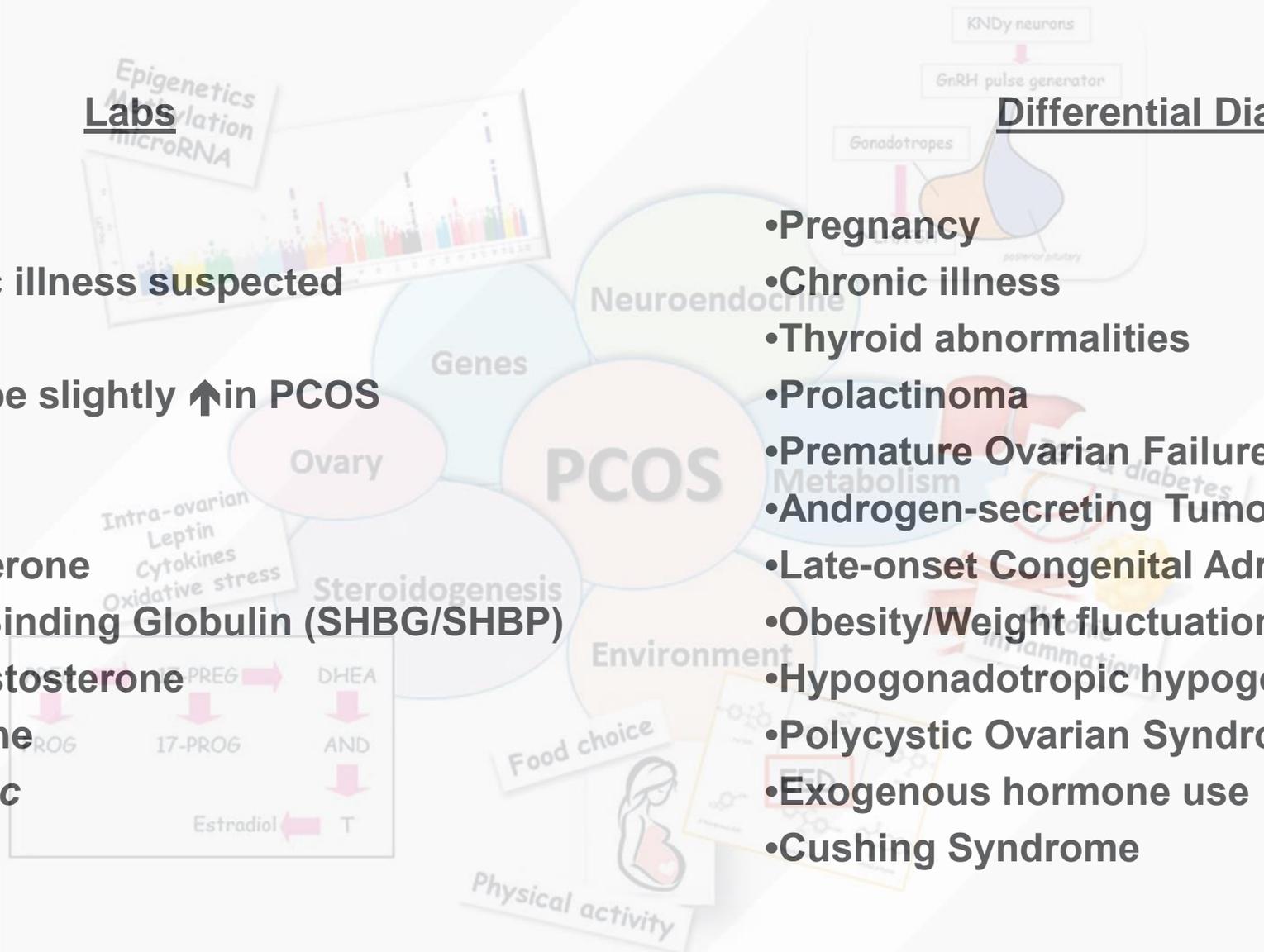
LABS - DIFFERENTIAL DIAGNOSIS

Labs

- Serum β -hCG
- ESR - if chronic illness suspected
- TFTs
- Prolactin-may be slightly \uparrow in PCOS
- LH/FSH
- DHEAS
- 17-OH Progesterone
- Sex Hormone Binding Globulin (SHBG/SHBP)
- Free + Total Testosterone
- Androstenedione
- Hemoglobin A1c
- CBC
- LFTs

Differential Diagnosis

- Pregnancy
- Chronic illness
- Thyroid abnormalities
- Prolactinoma
- Premature Ovarian Failure
- Androgen-secreting Tumor
- Late-onset Congenital Adrenal Hyperplasia
- Obesity/Weight fluctuation
- Hypogonadotropic hypogonadism
- Polycystic Ovarian Syndrome
- Exogenous hormone use
- Cushing Syndrome



ULTRASOUND

- Transvaginal ultrasound is **not** widely used in adolescent girls - many virginal
- Transabdominal ultrasound limited by obesity - poor image quality: a satisfactory image was obtained in 73% of slim women and only 38% of obese women.*
- Multiple follicles may be normal in adolescents.
- Increased ovarian volume may be increased in teens with PCOS (supportive) but is not diagnostic.
- Indicated when pelvic or abdominal pain/ ovarian or adrenal tumor is suspected.

DIAGNOSTIC CRITERIA

Table 1. Suggested criteria for the diagnosis of PCOS in adolescence

Required	Optional ^a	Not recommended ^b	Comments
1. Irregular menses/ oligomenorrhea 2. Evidence of hyperandrogenism: a. Biochemical b. Clinical (e.g., progressive hirsutism)	1. PCOM 2. Severe cystic acne	1. Obesity 2. Insulin resistance 3. Hyperinsulinemia 4. Biomarkers (e.g., AMH, T/DHT ratio) 5. Acanthosis nigricans	1. Must generally be 2 years post-menarche 2. Must rule out other disorders of hyperandrogenism (e.g., NC-CAH, Cushing syndrome)

PCOS; polycystic ovary syndrome; PCOM, polycystic ovarian morphology; AMH, anti-Müllerian hormone; T/DHT, testosterone to dihydrotestosterone; NC-CAH, non-classical congenital adrenal hyperplasia. ^a These criteria are often used in concert with the required criteria, but should not be used independently as diagnostic features. ^b These criteria have been associated with PCOS but are not diagnostic.

WHILE YOU WAIT

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



Condition	Sub-Condition	Cu-IUD		LNG-IUD		Implant		DMPA		POP		CHC	
		I	C	I	C	I	C	I	C	I	C	I	C
Age	Menarche to <20 yrs:2												
	Menarche to <20 yrs:1												
	Menarche to <18 yrs:1												
	Menarche to <18 yrs:2												
Anatomical abnormalities	a) Distorted uterine cavity	4	4										
	b) Other abnormalities	2	2										
	c) Iron-deficiency anemia	2	1	1	1	1	1	1	1	1	1	1	1
Breast disease	a) Undiagnosed mass	1	2	2*	2*	2*	2*	2*	2*	2*	2*	2*	2*
	b) Benign breast disease	1	1	1	1	1	1	1	1	1	1	1	1
	c) Family history of cancer	1	1	1	1	1	1	1	1	1	1	1	1
	d) Breast cancer ¹												
Breastfeeding	a) <21 days postpartum					2*	2*	2*	2*	2*	2*	2*	2*
	b) 21 to <30 days postpartum												
	i) With other risk factors for VTE					2*	2*	2*	2*	2*	2*	2*	2*
	ii) Without other risk factors for VTE					2*	2*	2*	2*	2*	2*	2*	2*
Cervical cancer	a) Mild (compensated)	1	1	1	1	1	1	1	1	1	1	1	1
	b) Severe (decompensated)	1	3	3	3	3	3	3	3	3	3	3	3
	c) 30-42 days postpartum												
	d) >42 days postpartum					1*	1*	1*	1*	1*	1*	1*	1*
Cervical ectropion	a) History of DVT/PE, not receiving anticoagulant therapy	1	2	2	2	2	2	2	2	2	2	2	2
	i) Higher risk for recurrent DVT/PE	1	2	2	2	2	2	2	2	2	2	2	2
	ii) Lower risk for recurrent DVT/PE	1	2	2	2	2	2	2	2	2	2	2	2
	b) Acute DVT/PE	2	2	2	2	2	2	2	2	2	2	2	2
Cystic fibrosis ¹	a) History of DVT/PE and established anticoagulant therapy for at least 3 months												
	i) Higher risk for recurrent DVT/PE	2	2	2	2	2	2	2	2	2	2	2	2
	ii) Lower risk for recurrent DVT/PE	2	2	2	2	2	2	2	2	2	2	2	2
	d) Family history (first-degree relatives)	1	1	1	1	1	1	1	1	1	1	1	1
Deep venous thrombosis (DVT)/Pulmonary embolism (PE)	e) Major surgery												
	i) With prolonged immobilization	1	2	2	2	2	2	2	2	2	2	2	2
	ii) Without prolonged immobilization	1	1	1	1	1	1	1	1	1	1	1	1
	f) Minor surgery without immobilization	1	1	1	1	1	1	1	1	1	1	1	1
Depressive disorders	a) Mild (compensated)	1*	1*	1*	1*	1*	1*	1*	1*	1*	1*	1*	1*
	b) Severe (decompensated)	1*	3	3	3	3	3	3	3	3	3	3	3

Key:			
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)

Condition	Sub-Condition	Cu-IUD		LNG-IUD		Implant		DMPA		POP		CHC	
		I	C	I	C	I	C	I	C	I	C	I	C
Diabetes	a) History of gestational disease	1	1	1	1	1	1	1	1	1	1	1	1
	b) Nonvascular disease												
	i) Non-insulin dependent	1	2	2	2	2	2	2	2	2	2	2	2
	ii) Insulin dependent	1	2	2	2	2	2	2	2	2	2	2	2
Dysmenorrhea	c) Nephropathy/retinopathy/neuropathy ¹	1	2	2	2	2	2	2	2	2	2	2	2
	d) Other vascular disease or diabetes of >20 years' duration ¹	1	2	2	2	2	2	2	2	2	2	2	2
	e) Severe	2	1	1	1	1	1	1	1	1	1	1	1
Endometrial cancer ¹	f) Endometrial hyperplasia	4	2	4	2	1	1	1	1	1	1	1	1
	g) Endometriosis	2	1	1	1	1	1	1	1	1	1	1	1
Epilepsy ²	h) Epilepsy ²	1	1	1*	1*	1*	1*	1*	1*	1*	1*	1*	1*
	i) Galbladder disease												
Gestational trophoblastic disease ¹	a) Symptomatic												
	i) Treated by cholecystectomy	1	2	2	2	2	2	2	2	2	2	2	2
	ii) Medically treated	1	2	2	2	2	2	2	2	2	2	2	2
	iii) Current	1	2	2	2	2	2	2	2	2	2	2	2
History of bariatric surgery ³	b) Asymptomatic	1	2	2	2	2	2	2	2	2	2	2	2
	a) Suspected GTD (immediate postevacuation)												
	i) Uterine size first trimester	1*	1*	1*	1*	1*	1*	1*	1*	1*	1*	1*	1*
	ii) Uterine size second trimester	2*	2*	2*	2*	2*	2*	2*	2*	2*	2*	2*	2*
Headaches	b) Confirmed GTD												
	i) Undetectable/non-pregnant β-hCG levels	1*	1*	1*	1*	1*	1*	1*	1*	1*	1*	1*	1*
	ii) Decreasing β-hCG levels	2*	1*	2*	1*	1*	1*	1*	1*	1*	1*	1*	1*
	iii) Persistently elevated β-hCG levels or malignant disease, with no evidence or suspicion of intrauterine disease	2*	1*	2*	1*	1*	1*	1*	1*	1*	1*	1*	1*
History of cholelithiasis	iv) Persistently elevated β-hCG levels or malignant disease, with evidence or suspicion of intrauterine disease	4*	2*	4*	2*	1*	1*	1*	1*	1*	1*	1*	1*
	a) Nonmigraine (mild or severe)	1	1	1	1	1	1	1	1	1	1	1	1
	b) Migraine												
	i) Without aura (includes menstrual migraine)	1	1	1	1	1	1	1	1	1	1	1	1
History of high blood pressure during pregnancy	ii) With aura	1	1	1	1	1	1	1	1	1	1	1	1
	a) Restrictive procedures	1	1	1	1	1	1	1	1	1	1	1	1
History of pelvic surgery	b) Malabsorptive procedures	1	1	1	1	1	1	1	1	3	3	3	3
	a) Pregnancy related	1	1	1	1	1	1	1	1	1	1	1	1
HIV	b) Past CDC related	1	2	2	2	2	2	2	2	2	2	2	2
	a) High risk for HIV	1	1	1	1	1	1	1	1	1	1	1	1
History of pelvic surgery	b) HIV infection	1*	1*	1*	1*	1*	1*	1*	1*	1*	1*	1*	1*
	i) Clinically well receiving ARV therapy	1	1	1	1	1	1	1	1	1	1	1	1
	ii) Not clinically well or not receiving ARV therapy ⁴	2	1	2	1	1	1	1	1	1	1	1	1
	c) Family history (first-degree relatives)	1	1	1	1	1	1	1	1	1	1	1	1

Abbreviations: ARV = antiretroviral; C=contraindication of contraceptive method; CHC=combined hormonal contraception (pill, patch, and ring); COC=combined oral contraceptive; Cu-IUD=copper-containing intrauterine device; DMPA=depot medroxyprogesterone acetate; I=initiation of contraceptive method; LNG-IUD=levonorgestrel-releasing intrauterine device; NA=not applicable; POP=progestin-only pill; PVR=patch/ring; SSRI=selective serotonin reuptake inhibitor; † Condition that exposes a woman to increased risk as a result of pregnancy. *Please see the complete guidance for a clarification to this classification: https://www.cdc.gov/od/odc/ohrt/contraception/contraception_guidance.htm

- Refer to Adolescent and Young Adult Medicine
 - (NOT urgent unless patient is anemic <11 g/dL and with current prolonged bleeding).
- Screen for contraindication to estrogen-containing medication using U.S. CDC MEC
- If heavy bleeding and/or hemoglobin <9 g/dL, send to Emergency Department.

RESULTS

- Quantitative hCG – negative
- ESR - 15 (0-20 mm)
- TSH - 1.2 uU/mL (0.4-4.6) / FT4 - 1.44 ng/dL (0.8-2.0)
- Prolactin - 7.12 ng /mL (3.8-23.2)
- LH/FSH - 12.94 mIU/ml / 4.74 mIU/mL
- DHEAS* - **320 mcg/dL** (37-307 mcg/dL)
- 17-OH progesterone - 112 ng/dL (10-290)
- Total Testosterone - **61 ng/dL** (0-33 Tanner 5)
- Free Testosterone – **11.4 pg/ml** (.7-3.6 pg/ml)
- Sex Hormone Binding Globulin - 15 ng/dL (>20 ng/dL)
- Androstenedione* (60% ovarian, 40% adrenal) - 251 ng/dL (<269 ng/dL)
- Hgb A1c – 5.5% (4.2-6.5%)
- Hgb - 11.9 g/dL (12.5-15 g/dL)

*may be mildly elevated in PCOS

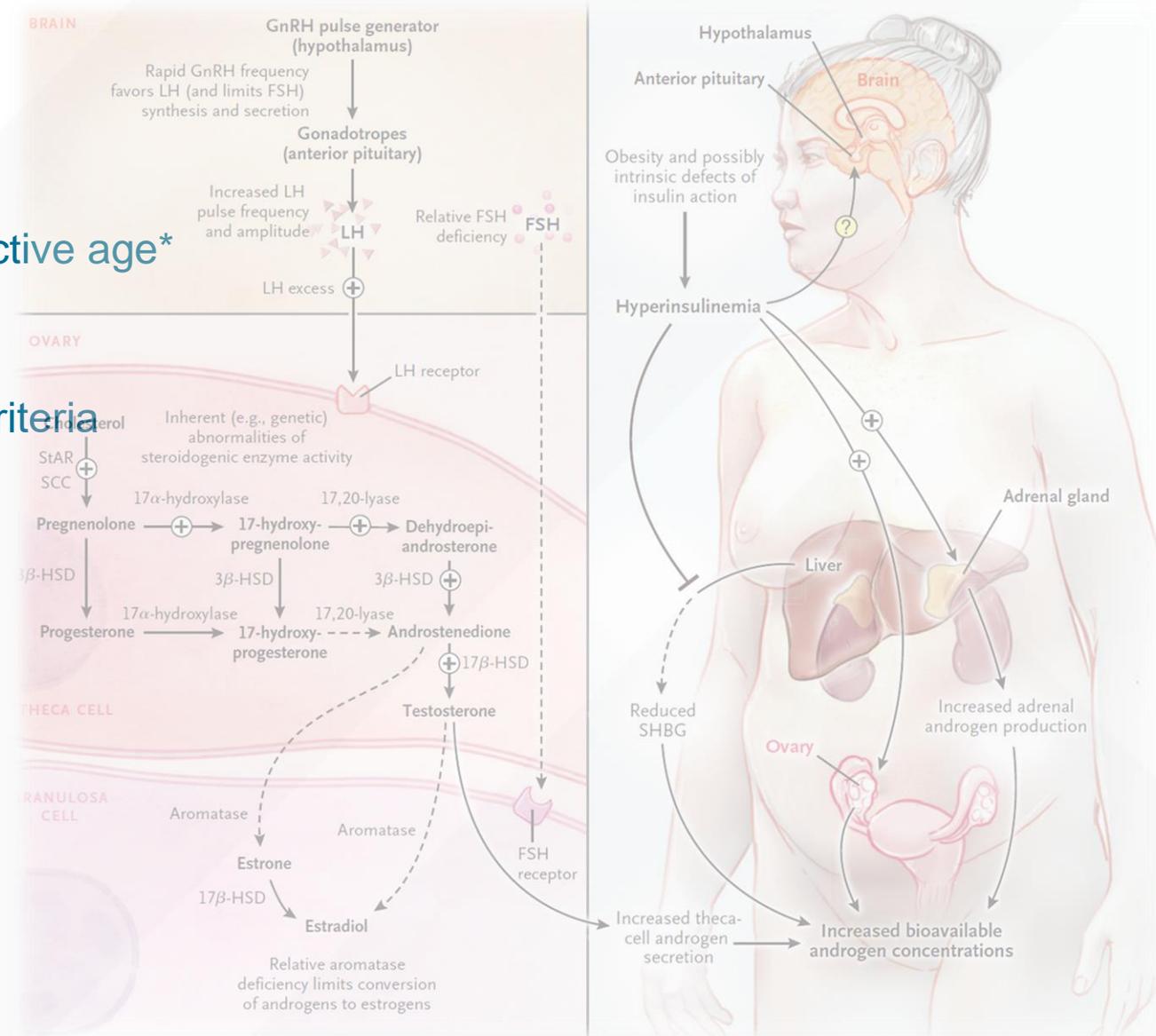


PCOS STATISTICS

- Affects approximately 5-10% of all women of reproductive age*
- Affects 1% all adolescent girls **
- All prevalence studies based on different diagnostic criteria

*ACOG Practice Bulletin, 2009

**Christensen, et al, Fertil Steril 100(2), 2013



PCOS PHARMACOLOGIC TREATMENT

If no menses within past 2 months:

1st Provera (medroxyprogesterone acetate) 10 mg PO daily x 10 days

→ Withdrawal bleed within 2 weeks of completing 10-day course of Provera

THEN

Once patient has had period or withdrawal bleed within past 2 months:

Starting on 4th day of bleeding, patient starts daily combined oral contraceptive pill – norgestimate-ethinyl estradiol 0.25-35 mg-mcg (Sprintec, Ortho-Cyclen, MonNessa)*.

Counsel:

- ***need for pill daily – otherwise breakthrough bleeding***
- ***immediate side effects – nausea, bloating***

Please AVOID triphasic pills (TriSprintec, Ortho-Tricyclen, etc) – confusing!

Follow up in 6 weeks to check patient adherence, bleeding pattern, symptoms of clot/hypercoagulation.

*Endocrine Society also mentions Ortho-Evra patch and Nuvaring

NON-PHARMA, ADJUNCT & ALTERNATIVE TREATMENTS

Low glycemic index diet*

Daily aerobic exercise*

Consider:

Vitamin D

Metformin (start with 750 mg PO at dinner) – counsel re: N/V/D, increased fertility

Contraindication to estrogen:

Hormonal IUD

Episodic progestins (q 1-3 month withdrawal bleeds)

*Difficult to sustain and unhelpful if BMI WNL



ADDITIONAL EVALUATION

- Signs and symptoms of sleep disorder
- Waist circumference
- Fasting insulin
- 2 Hour Oral Glucose Tolerance Test*
- Fasting Lipids-high triglycerides, low HDL 70%
- Hemoglobin A1c
- Liver function tests if obese

*May do fasting glucose only in lean girls



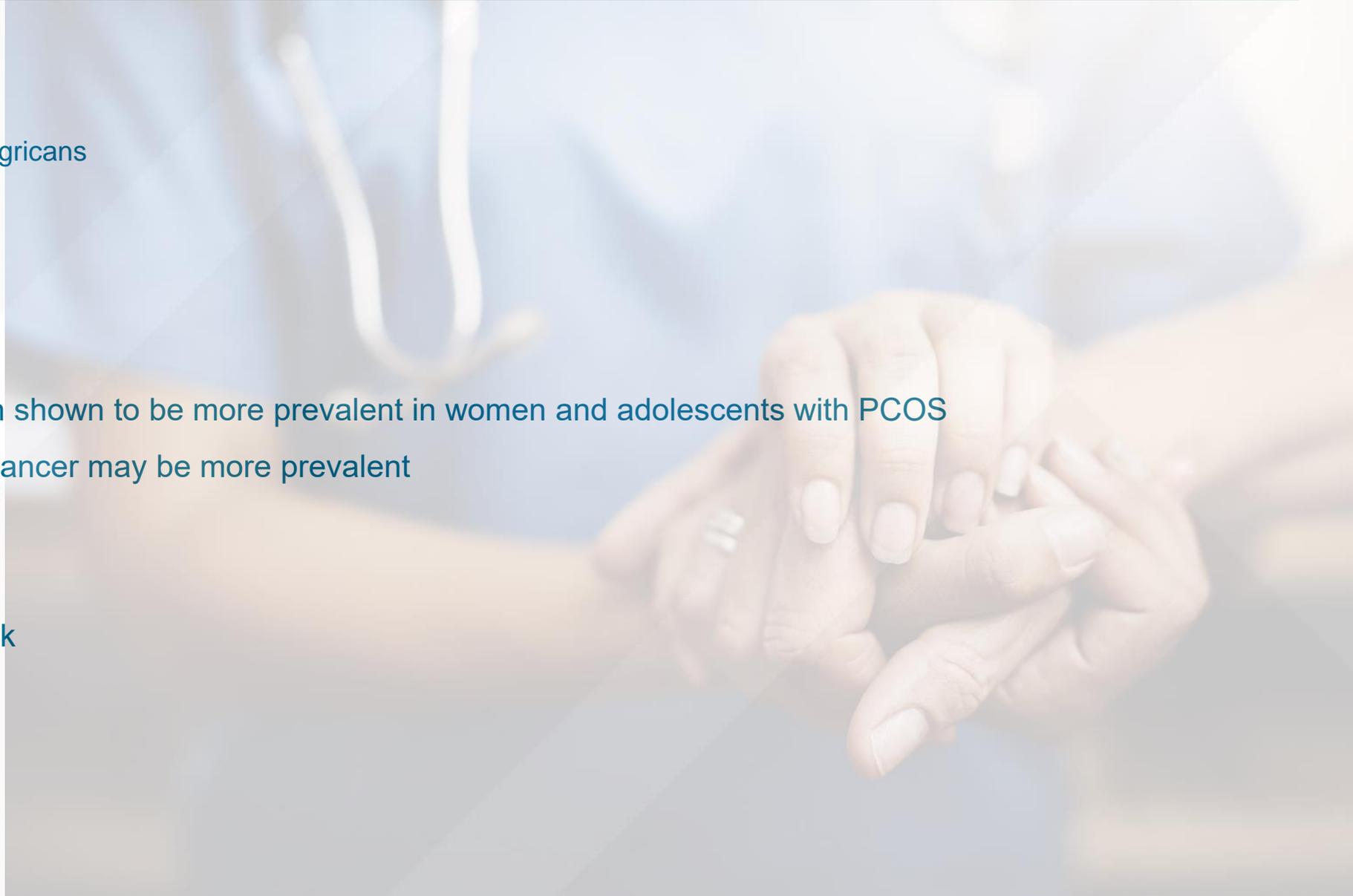
COUNSELING

- Metabolic Syndrome

- Insulin resistance-acanthosis nigricans
- Dyslipidemia
- Hypertension
- Abdominal adiposity

- Sub-fertility

- Type II diabetes mellitus has been shown to be more prevalent in women and adolescents with PCOS
- Endometrial, ovarian and breast cancer may be more prevalent
- Infertility is more prevalent
- Cardiovascular disease risk
- Endometrial and breast cancer risk



References

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Mahalo to Dr. Elizabeth Alderman, Children's Hospital At Montefiore

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