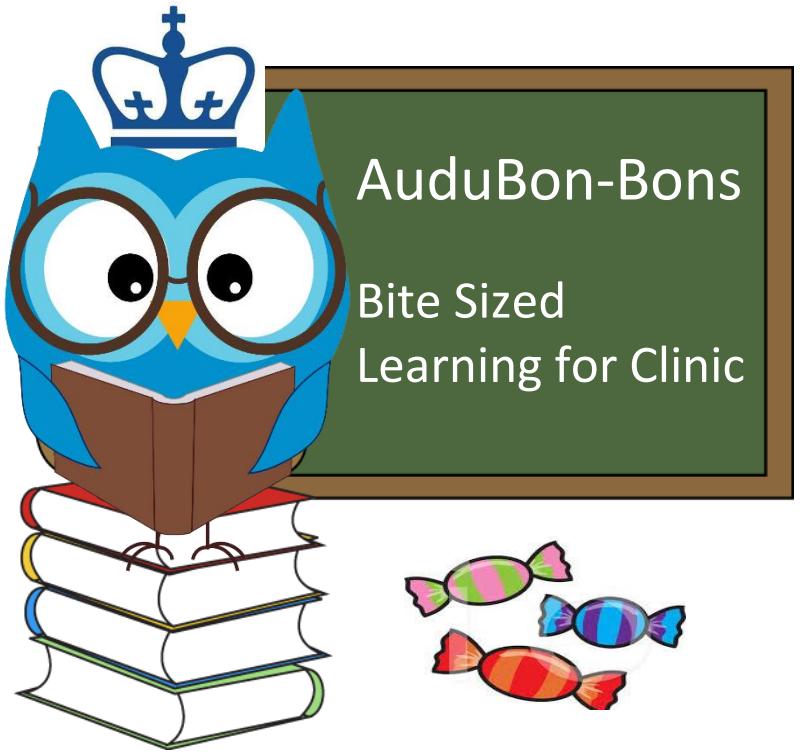
POLYCYSTIC OVARY SYNDROME: METABOLIC SYNDROME



Week 82

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SDH and .phrase slides by Chloé Altchek, MS4

Reading Assignment:
ACOG Practice Bulletin #194: *Polycystic Ovary Syndrome,* June 2018

LEARNING OBJECTIVES 

- Understand the definitions and pathophysiology of PCOS
- Understand the basic work-up and evaluation of PCOS
- Understand the comorbidities associated with PCOS
- Understand appropriate management for patients with PCOS

CASE VIGNETTE

- Patient is a 33 y.o G0 woman who presents to your office for a new GYN visit. She reports a 10 year history of irregular cycles. Her LMP was 2 months ago.

- She complains of accelerating hair loss and persistent acne. She and her partner would like to have children; they have been attempting to conceive for 2 years.

FOCUSED HISTORY

What elements of the patient's history are most relevant?

- **POB:** G0
- **PGYN:** Menarche 12 yo; **irregular cycles**, **q 3-4 months**
  No STI/cysts/fibroids
  No abnormal paps
- **PMH:** **Obesity**
- **PSH:** Laparoscopic ovarian cystectomy 4 years ago
- **FH:** None
- **Meds:** None
- **All:** NKDA
- **SH:** No T/E/D; works as manager at a Chipotle; married; denies IPV

PERTINENT OBJECTIVE FINDINGS

What elements of the patient's physical exam are most relevant?

- **P:** 99 **BP:** 150/89 **Wt:** 99 kg **Ht:** 170 cm **BMI: 34.3**
- **Gen:** NAD
- **HEENT**: No thyromegaly, no acanthosis nigricans; minimal alopecia noted in male distribution; some facial hair and minimal acne noted
- **Chest**: CTAB
- **CVS**: RRR, S1S2
- **Abd:** Soft, NT/ND; obese
- **GU:** NEFG; cervix WNL, no discharge/lesions; uterus 6 wk sized, retroverted, no adnexal masses

BACKGROUND

What is polycystic ovary syndrome?

- A disorder characterized by hyperandrogenism, ovulatory dysfunction, and polycystic ovaries
- The most common endocrine disorder in women

What is the prevalence of PCOS?

- Depends on diagnostic criteria used: **7%** (NIH criteria), **15%** (Rotterdam criteria)

What is the pathophysiology of PCOS?

- Unclear; likely multifactorial with multiple genetic and environmental factors
- **Insulin resistance** plays a key role in features of this disorder
  - Hyperinsulinemia causes decreased SHBG, leading to more available circulating androgens as well as increased secretion by the adrenals and the ovaries
- **Hyperandrogenism** has multiple etiologies; an underlying genetic predisposition is likely possible
- **Ovarian folliculogenesis** is abnormal with insufficient FSH stimulus or response to FSH
- **Increased LH activity** can lead to increased androgen secretion by thecal cells
  - Higher LH:FSH
- **Obesity** can worsen the effects of PCOS
  - Obesity is not a requirement for diagnosis**

CLINICAL ASSESSMENT

What is the differential for PCOS?

Box 3. Factors to Consider in the Differential Diagnosis of Polycystic Ovary Syndrome

- Androgen secreting tumor
- Exogenous androgens
- Cushing syndrome
- Nonclassical congenital adrenal hyperplasia
- Acromegaly
- Genetic defects in insulin action
- Primary hypothalamic amenorrhea
- Primary ovarian failure
- Thyroid disease
- Prolactin disorders

What are the diagnostic criteria for PCOS?

Table 1. Recommended Diagnostic Schemes for Polycystic Ovary Syndrome by Varying Expert Groups

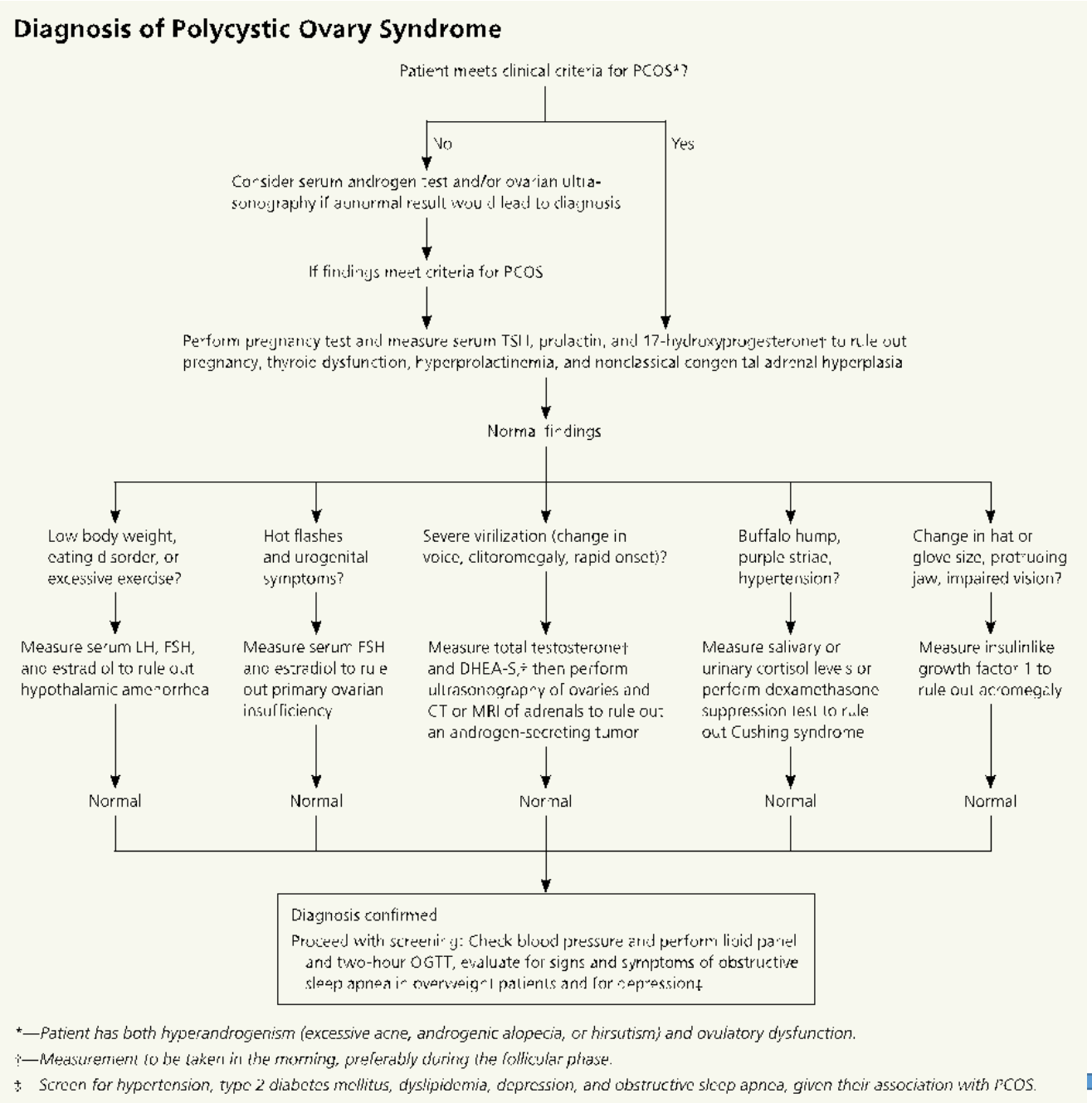
Signs and Symptoms*	National Institutes of Health Criteria† 1990 (both are required for diagnosis)	Rotterdam Consensus Criteria 2003‡ (two out of three are required for diagnosis)	Androgen Excess Society§ 2006 (hyperandrogenism plus one out of remaining two are required for diagnosis)
Hyperandrogenism‖	R	NR	R
Oligoamenorhhea or amenorrhea	R	NR	NR
Polycystic ovaries by ultrasound diagnosis		NR	NR

ACOG PB 194, 2018

CLINICAL ASSESSMENT

How do you assess patients for PCOS?

- **History**
  - Focus on menstrual history, onset and severity of the signs of androgen excess, medications, family history of DM and CV disease
- **Physical exam**
  - Full exam
  - Assess for signs of hyperandrogenism and insulin resistance, such as acne, hirsutism, androgenic alopecia, acanthosis nigricans
  - Consider assessing for signs of other etiologies of hyperandrogenism:
    - *Cushing syndrome*- moon facies, buffalo hump, abdominal striae, centripetal fat distribution, HTN, proximal myopathies, easy bruising
    - *Clitoromegaly*- more rarely seen in PCOS, more commonly seen in other conditions such as CAH or androgen-secreting tumors, or exogenous steroid use
- **Lab evaluation**
  - bHCG, PRL, TSH, free testosterone (or total testosterone + SHBG), 17-OH progesterone
  - 2 hr OGTT and lipid panel for confirmed PCOS
- **Imaging**
  - Ultrasonography can be considered, although not necessary for diagnosis



At what testosterone level and DHEAS level are you concerned about a tumor of ovarian/adrenal origin?

- **Testosterone > 2 ng/mL**
- **DHEAS > 700 mcg/dL**

What population should you consider screening for non-classical congenital adrenal hyperplasia?

- Adult women w/ anovulation and hirsutism and are from specific ethnic groups (Ashkenazi Jews, Hispanics, Yugoslavs, Native American Inuits, Italians)

Williams 2016, p 108

COUNSELING AND MANAGEMENT

What are reproductive health risks in women with PCOS?

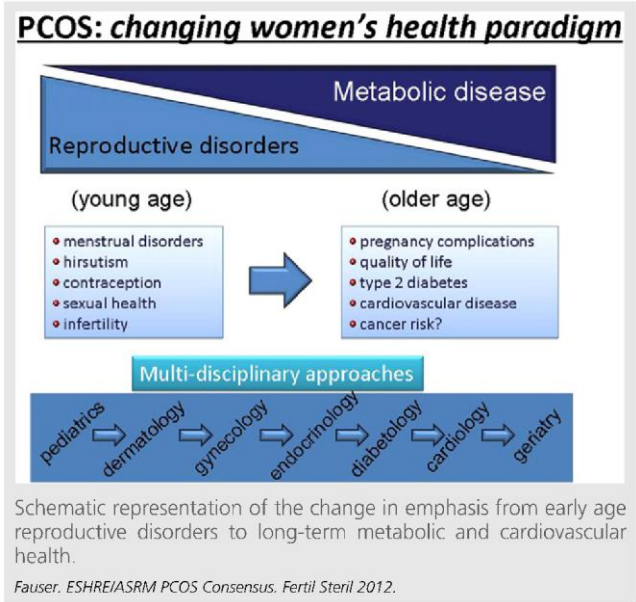
- Infertility, menstrual disorders
- Increased risk of ovarian hyperstimulation in those undergoing ovulation induction
- Increased risk for pregnancy complications (GDM, hypertensive disorders)

What are the long-term health risks of PCOS?

- Increased risk of diabetes and cardiovascular disease
- Increased risk of metabolic syndrome, NAFLD, obesity-related morbidities (including OSA)
- Increased risk of endometrial cancer (especially in women with multiple risk factors-centripetal obesity, diabetes, chronic anovulation)
- Possible increased risk of mood disturbances and depression

How do you define metabolic syndrome?

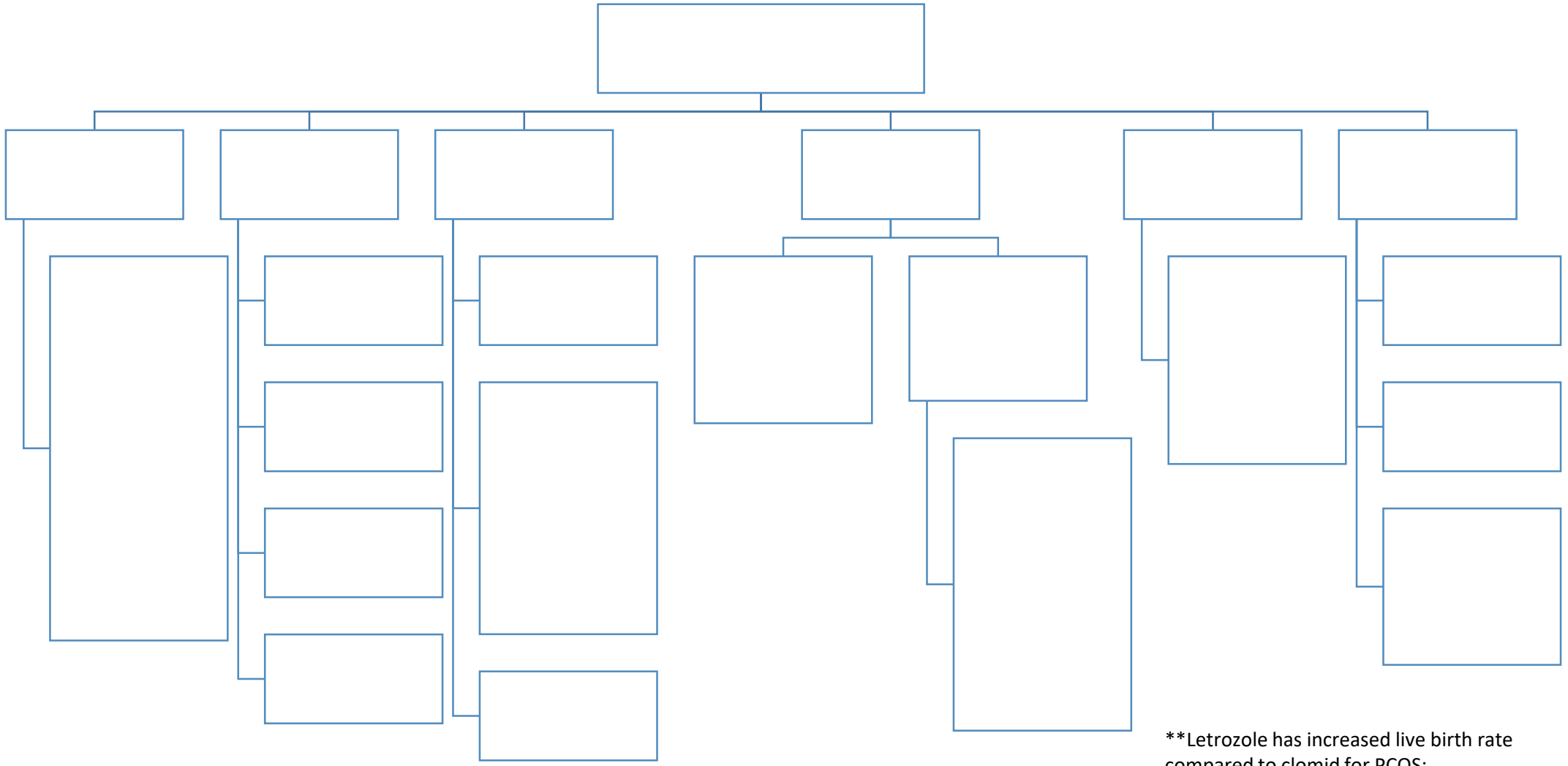
- Elevated BP (>/= 130/85)
- Increased waist circumference (>/= 35 in.)
- Elevated fasting glucose levels (>/= 100 mg/dL)
- Reduced HDL (</= 50 mg/dL)
- Elevated triglyceride levels (>/= 150 mg/dL)



Schematic representation of the change in emphasis from early age reproductive disorders to long-term metabolic and cardiovascular health.

Fauser. ESHRE/ASRM PCOS Consensus. Fertil Steril 2012.

COUNSELING AND MANAGEMENT



**Letrozole has increased live birth rate compared to clomid for PCOS;
Both have equal risk of twin gestation

SOCIAL DETERMINANTS OF HEALTH

Racial and ethnic differences in insulin resistance, metabolic syndrome, and hyperandrogenemia in women with PCOS

Hispanic women have the most severe PCOS phenotype compared to Black and White women

- Higher prevalence of hyperandrogenemia, insulin resistance, systolic hypertension, and hyperglycemia
- Higher prevalence of hyperandrogenemia may be related to the higher prevalence of hyperinsulinemia, insulin resistance, and consequently low serum sex hormone binding globulin

Black women have an overall milder PCOS phenotype than Hispanics and White women

- Lower prevalence of metabolic syndrome than Hispanic women
- Lower prevalence of hypertriglyceridemia than both Hispanics and White women

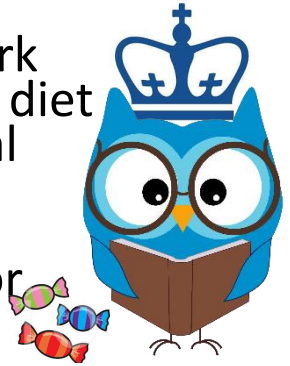
EPIC .PHRASE

.BBonPCOS

Description: PCOS counseling and management

Pt with new diagnosis of PCOS was counseled on characteristics/symptoms of the syndrome including hyperandrogenism, ovulatory dysfunction, and polycystic ovaries. The lack of known pathophysiology of PCOS was discussed, but the patient was advised that the etiology is likely multifactorial with multiple genetic and environmental factors. The patient was counseled on associated reproductive health risks including infertility, menstrual disorders, ovarian hyperstimulation in those undergoing ovulation induction, and pregnancy complications (GDM, hypertensive disorders). Long-term health risks of PCOS were also discussed including increased risk of diabetes, cardiovascular disease, metabolic syndrome, NAFLD, obesity-related morbidities (including OSA), endometrial cancer (especially in women with multiple risk factors-centripetal obesity, diabetes, chronic anovulation), mood disturbances and depression. All questions were answered.

Pt was counseled on initial management and treatment options. It was explained that the goals of therapy will be restoration of ovulatory cycles, improvement of metabolic/cardiovascular risks and reduction of hyperandrogenic features. Initial lab work will include 2hr OGTT and lipid panel. ***If overweight, life style modifications including diet and exercise were discussed for a goal of 5% weight reduction. Options for initial medical management of menstrual irregularities, metabolic abnormalities and endometrial protection were outlined and the patient will be started on ***[OCPs/progestin-only contraception/metformin]. The patient's reproductive goals were elicited and options for future ovulation induction were discussed.



CODING AND BILLING

- ICD-10
  - **E28.0** - Polycystic ovary syndrome
  - **E88.1**- Metabolic syndrome
- CPT
  - **99213**- Established outpatient visit (99214 if attending sees patient with you)

EVIDENCE

- Polycystic ovary syndrome. ACOG Practice Bulletin No. 194. American College of Obstetricians and Gynecologists. Obstet Gynecol 2018;131:e157–71.
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- Williams et al. Diagnosis and treatment of polycystic ovary syndrome. Amer Fam Phys 2016; 94(2): 106-113.
- Azzis R . Epidemiology, phenotype, and genetics of the polycystic ovary syndrome in adults. Barbieri R ed. UpToDate. Waltham, MA: UpToDate Inc. https://www.uptodate.com/contents/epidemiology-phenotype-and-genetics-of-the-polycystic-ovary-syndrome-in-adults. Cccessed Feb 2020.
- Engmann L, Jin S, Sun F, Legro RS, Polotsky AJ, Hansen KR, Coutifaris C, Diamond MP, Eisenberg E, Zhang H, Santoro N; Reproductive Medicine Network. Racial and ethnic differences in the polycystic ovary syndrome metabolic phenotype. Am J Obstet Gynecol. 2017 May;216(5):493.e1-493.e13. doi: 10.1016/j.ajog.2017.01.003. Epub 2017 Jan 16. PMID: 28104402; PMCID: PMC5420474.