# Polycystic Ovary Syndrome

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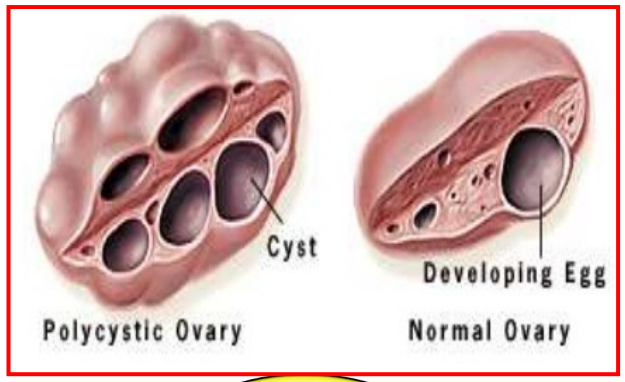
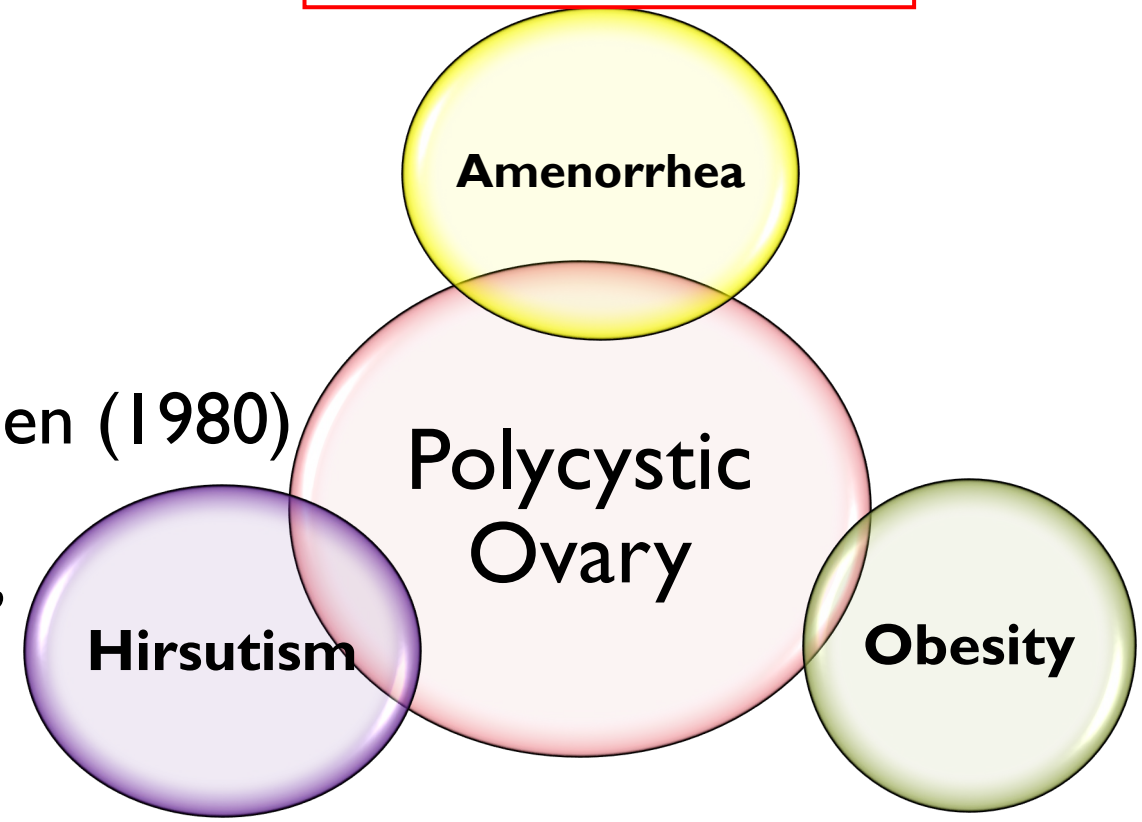
# Polycystic Ovary Syndrome

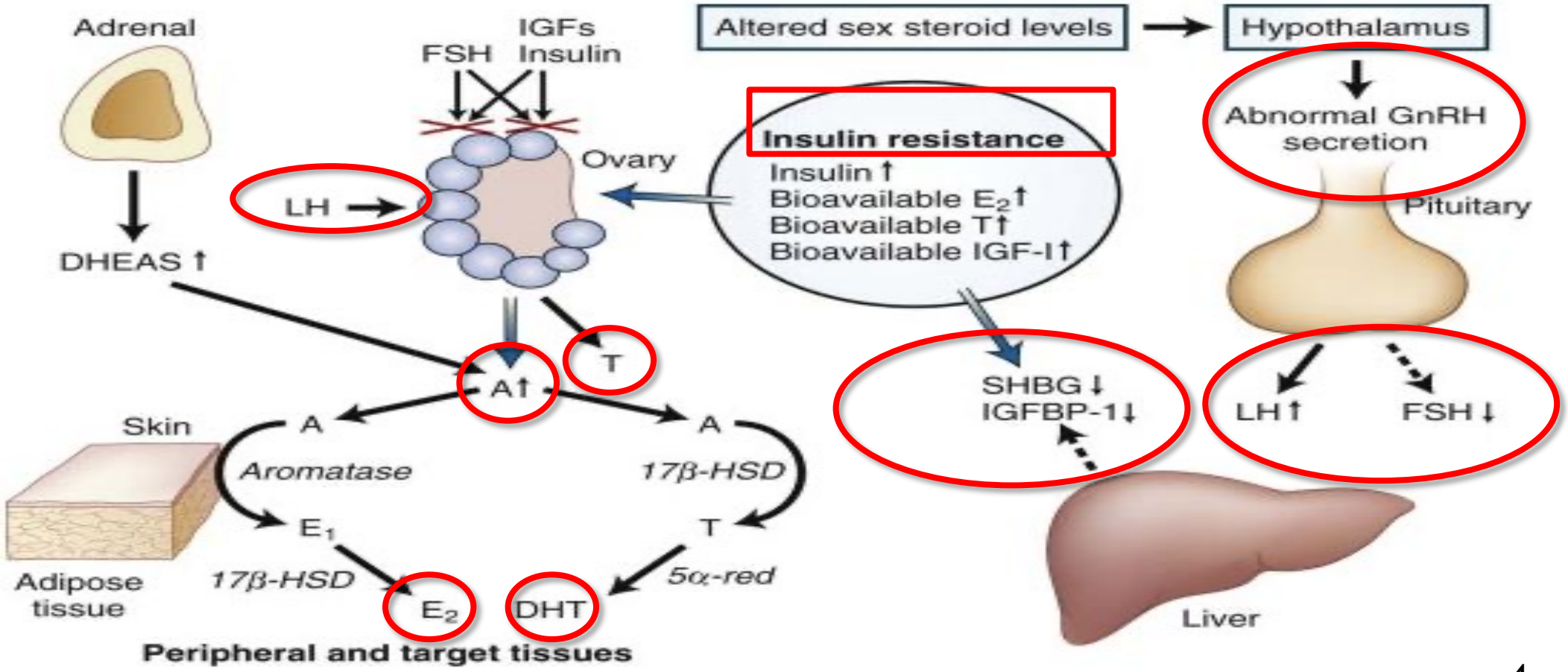



- First described by Stein & Leventhal (1935)
- Incidence : 5-10%
- Leading cause of female infertility
- Insulin resistance described by Burghen (1980)
- Triad of oligomenorrhea/amenorrhea,

Obesity (androgenic), and hirsurism.



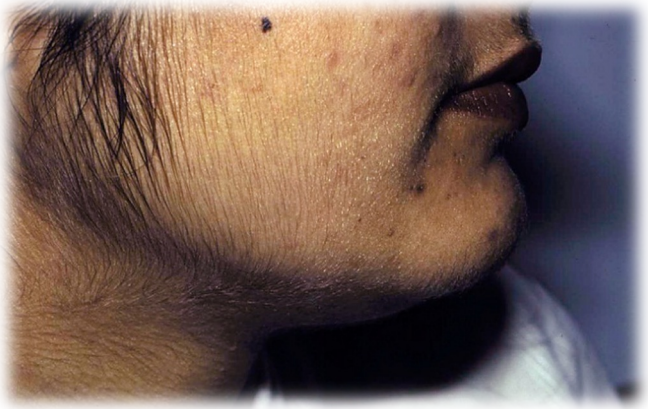
# PCOS - Pathophysiology

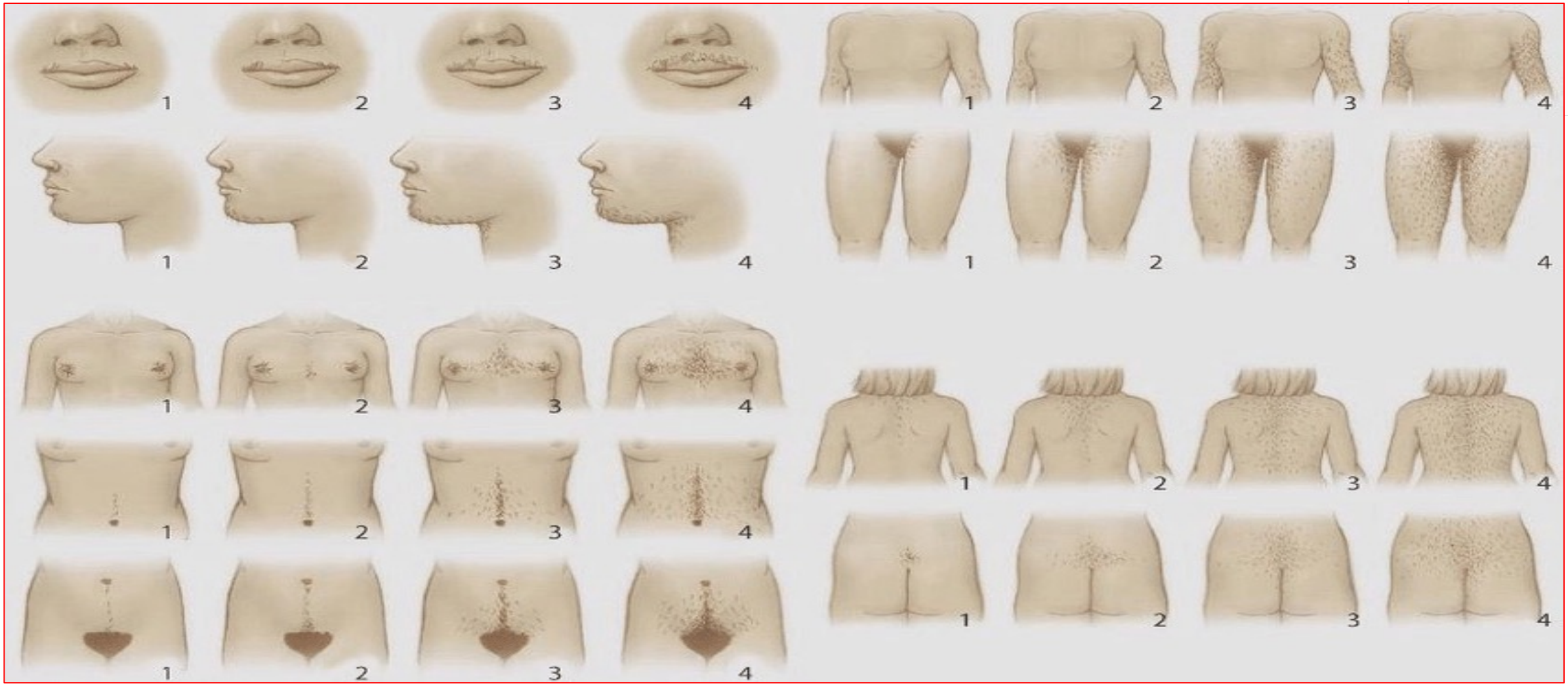


# PCOS – Clinical Features



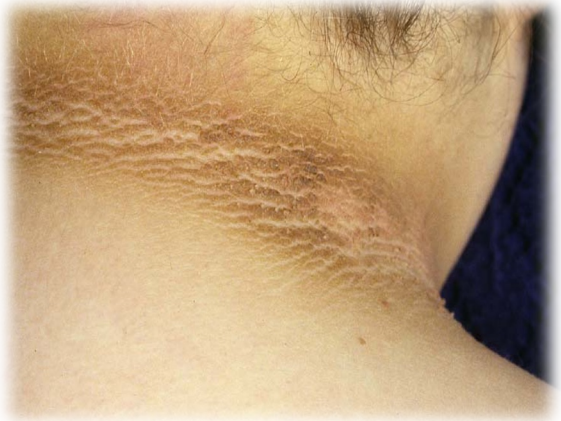
- **Hyperandrogenism**
  - Hirsutism
    - Modified Ferriman Gallwey Score
  - Acne
  - Androgenic alopecia
- **Menstrual Irregularity**
  - Oligomenorrhea (70-75%)
  - Amenorrhea (20%)
  - Infertility (30-70%)

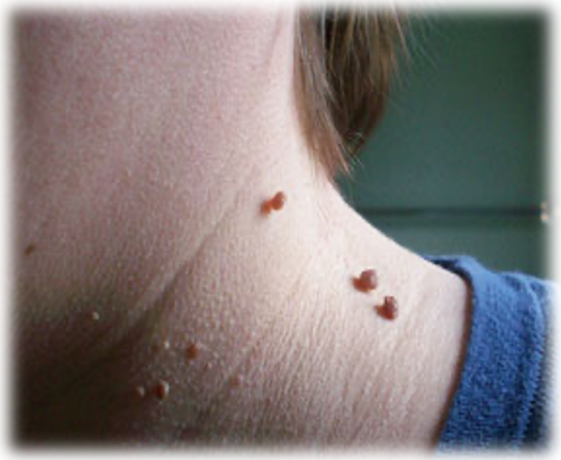





The modified Ferriman-Gallwey (mFG) score grades 9 body areas from **0** (no hair) to 4 (frankly virile), including the ***upper lip, chin, chest, upper abdomen, lower abdomen, thighs, back, arm, and buttocks*****.** A total score of 8 **or more is** considered abnormal for an adult white woman; a score of 36 is the most severe.

# PCOS – Clinical Features

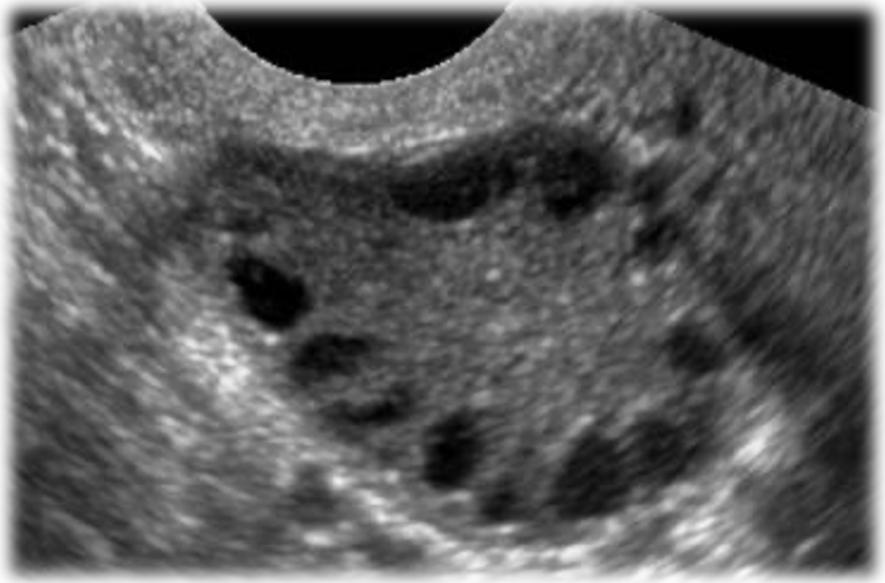




- **Obesity**
- **Insulin resistance**
  - Acanthosis nigricans
  - Skin tags
  - Impaired Glucose tolerance
  - Type 2 DM

# PCOS – Evaluation

- **Biochemical evidence of hyper-androgenism:**
  - S. Total testosterone
- **USG evidence of Polycystic ovary**
  - 12 or more follicles in each ovary measuring 2-9 mm in diameter
    +/- inc. ovarian volume (>10 mL)
    [Rotterdam criteria]



# PCOS – Evaluation



- **Exclusion of other differential diagnoses**
  1. Hyperprolactinemia, hypothyroidism
  2. Non-Classical Congenital Adrenal Hyperplasia
  3. Ovarian & Adrenal tumors
  4. Cushing's syndrome, Glucocorticoid resistance
  5. Drugs : Danazol, OCPs

# PCOS – Diagnostic criteria

Osama M Warda
Professor of Obs/Gyn

## NIH (1990)

- **Menstrual Irregularity**
- **Hyperandrogenism**
- **Exclusion of other etiologies**

## Rotterdam (2003)

- **2 out of 3 required**

1. Menstrual Irregularity
2. Hyperandrogenism
3. **USG – Polycystic ovary**

- Exclusion of other etiologies

## AES (2006)

- **Menstrual irregularity +/- USG - Polycystic ovary**
- **Hyperandrogenism**
- **Exclusion of other etiologies**

# PCOS – Management



- **Lifestyle modifications –**
  1. Low calorie diet
  2. Regular brisk walk 25-35 min daily
- **Hormonal contraceptives –**
  - 1st line treatment of hirsutism, acne and menstrual irregularity
- **Spironolactone**
  - Added to OCPs if suboptimal results after 6 months

Legro, Richard S., et al. "Diagnosis and treatment of polycystic ovary syndrome: an Endocrine Society clinical practice guideline." Journal of Clinical Endocrinology & Metabolism 98.12 (2013): 4565-4592.

# PCOS – Management



- **Clomiphene citrate –**
  - 1st line treatment for infertility
- **Insulin sensitizing agents –**
  - Metformin – limited recommendations
- **Screening** patients for long term complications
  - Endometrial cancer, Mood disorders, Obstructive sleep apnea, DM, Cardiovascular disease

Legro, Richard S., et al. "Diagnosis and treatment of polycystic ovary syndrome: an Endocrine Society clinical practice guideline." Journal of Clinical Endocrinology & Metabolism 98.12 (2013): 4565-4592.

# Spironolactone

- **Actions**
  1. Androgen receptor blockade
  2. Steroid synthesis inhibitor
  3. Aldosterone receptor blockade
- **Status in PCOS management**
  1. 2nd line drug for treatment of hirsutism, acne
  2. If used alone, alternative contraception needed
  3. No endometrial protection

# Metformin

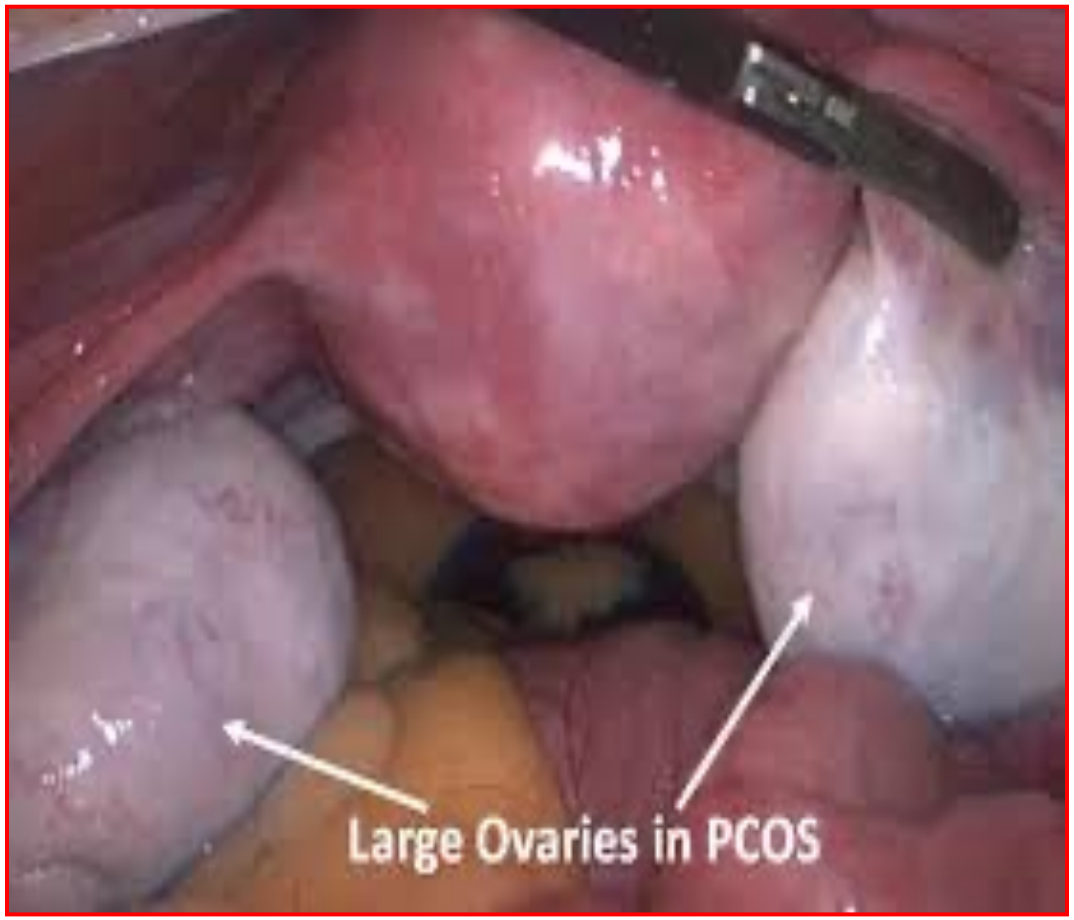


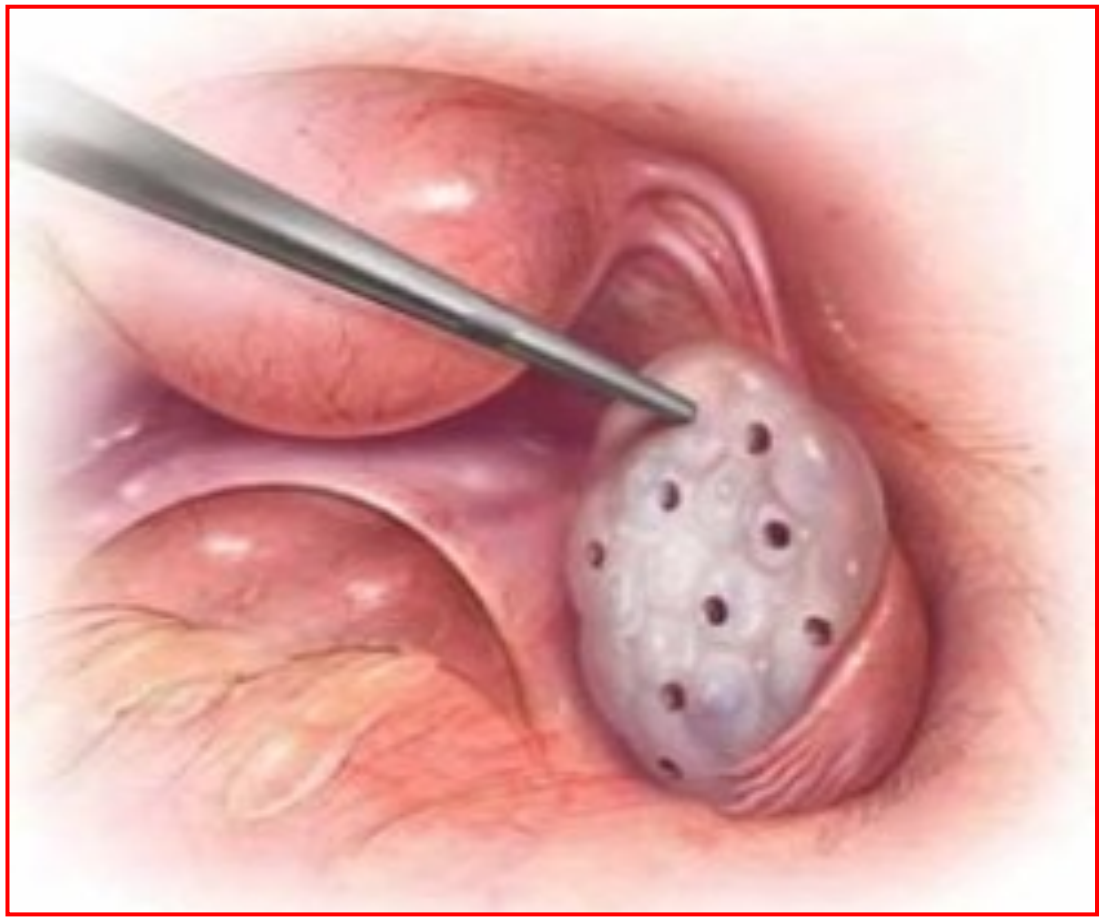
- **Actions**
  1. Increase insulin sensitivity
  2. Directly inhibit human theca cell androgen synthesis
- **Status in PCOS management**
  1. Women with PCOS and type 2 DM or IGT
  2. Women who cannot take oral contraceptives
  3. Adjuvant therapy in women undergoing IVF – prevent ovarian hyperstimulation

# Laparoscopic Ovarian drilling

- Ovarian drilling is sometimes used for women with PCOS who are still not ovulating after trying weight loss and fertility medicine. Destroying part of the ovaries may restore regular ovulation cycles.
- For women who do not respond to treatment with medicine, such as clomiphene, about 50% of them may be able to become pregnant after they have ovarian drilling surgery .

Fritz MA, Speroff L (2011).


Large Ovaries in PCOS



# ENDOCRIE SOCIETY GUIDELINES PCOS 2013



## Diagnosis of PCOS

- 3 Recommendations

## Associated Comorbidity & Evaluation

- 12 Recommendations

## Treatment of PCOS

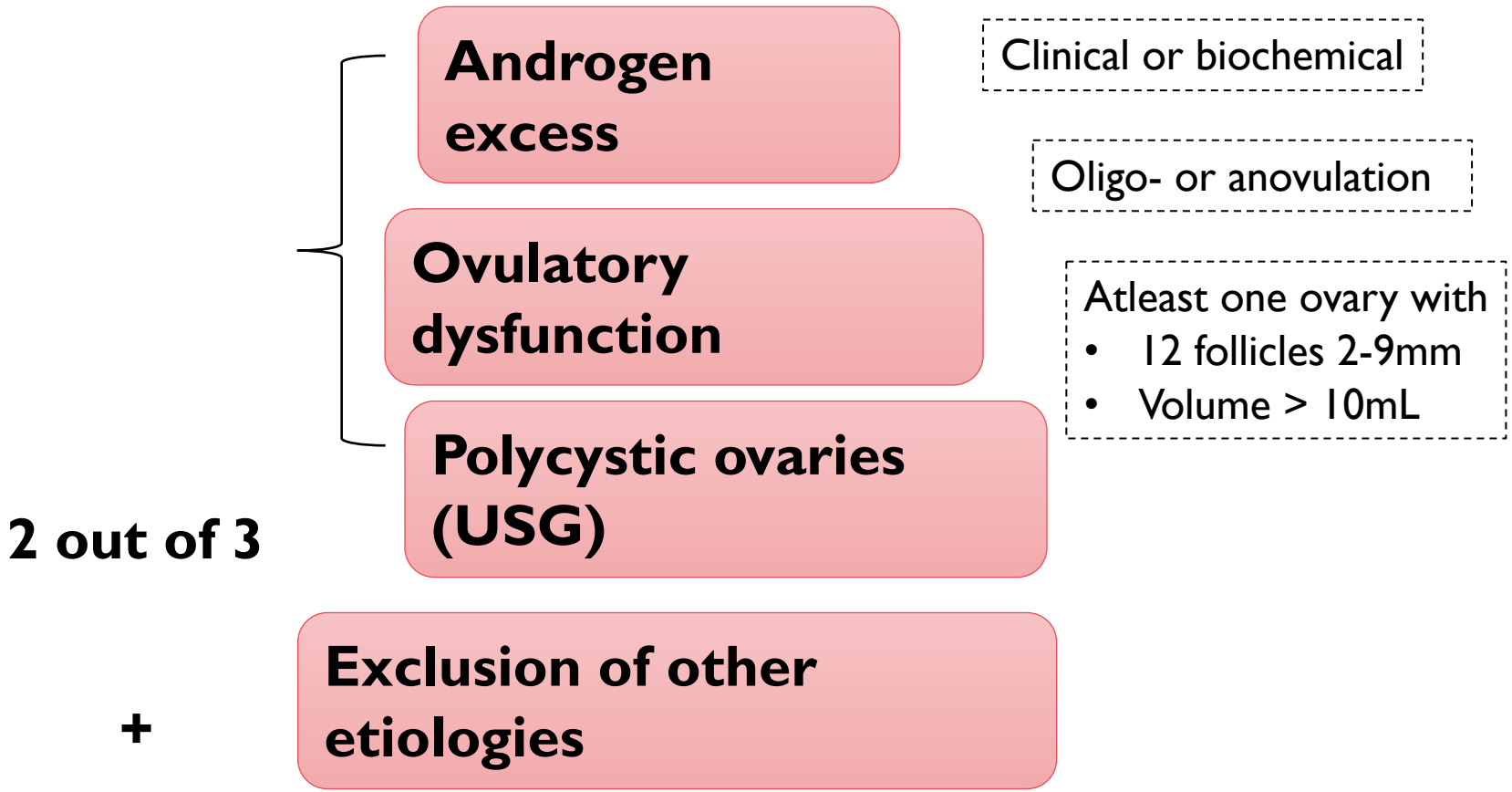
- 12 Recommendations

# E S GUIDELINES PCOS 2013

- I - Diagnosis of PCOS

# 1.1 - Diagnosis of PCOS in Adults

- Rotterdam (2003) criteria



# 1.1 - Diagnosis of PCOS in Adults

- Rotterdam (2003) criteria



**Exclusion of other etiologies**

- Thyroid disease
- Hyperprolactin
- Nonclassical congenital adrenal hyperplasia
- Cushing's syndrome
- Acromegaly
- Androgen secreting tumors
- Other causes of amenorrhea

# 1.2 - Diagnosis of PCOS in adolescents

- Anovulation and Polycystic ovary NOT reliable

**Androgen excess**

+

**Persistent oligomenorrhea**

>2 yrs beyond menarche

+

**Exclusion of other etiologies**

## 1.3 Diagnosis in perimenopause and menopause

- Long term history of oligomenorrhea & hyperandrogenism
- Polycystic ovary – less likely

# E S GUIDELINES PCOS 2013

## 2 - Associated comorbidity and Evaluation

# 2.1 - Documenting cutaneous manifestations:

a. Hirsutism (Modified Ferriman-Gallwey score)

b. Acne

c. Adrogenic alopecia (Ludwig score)

d. Acanthosis nigricans

e. Skin tags


Ludwig scale
chemeter.net

# Female Pattern Hair Loss
## (Ludwig Scale)


1-1


1-2


1-3


1-4


2-1


2-2


3


Frontal

## 2.2 - Screening ovulatory status (even in eu-menorrheic Pts.)

- ↑ Risk of anovulation and infertility
- Menstrual history
- Mid-luteal S. Progesterone

## 2.3 - Exclude other causes of infertility in couples

- Obesity, Male factor infertility, tubal occlusion

## 2.4 – Pre-conceptual Assessment:

a. ↑ Risk of pregnancy complications (GDM, Preterm delivery, Pre-eclampsia)

b. BMI, BP, OGTT

## 2.5 - No intervention for prevention of PCOS in offspring of PCOS women

- Inconclusive evidence of intrauterine effects

## 2.6 - No routine USG screening for endometrial thickness in PCOS women without abnormal bleeding

- Poor diagnostic accuracy

## 2.7 - Screen for increased adiposity

- Ass. with Hyperandrogenemia and ↑ Metabolic risk
- BMI, Waist circumference

## 2.8 - Screen and manage depression and anxiety

## 2.9 - Screen and manage Obstructive sleep apnea (OSA)

- Polysomnography

## 2.10 - Awareness about possibility of NAFLD* and NASH* (No screening)

## 2.11 - Screen for impaired glucose tolerance(IGT) and T2DM

- OGTT or HbA1c
- Re-screening every 3-5 years

*Nonalcoholic fatty liver disease (NAFLD) is a condition in which fat builds up in your liver. Nonalcoholic fatty liver (NAFL) and nonalcoholic steatohepatitis (NASH) are types of NAFLD.

# 2.12 - Screen for CVD risk factors

## At risk

1. Obesity
2. Cigarette smoking
3. Hypertension
4. Dyslipidemia
5. Subclinical vascular disease
6. Impaired glucose tolerance
7. Family history of premature CVD

## High risk

1. Metabolic syndrome
2. T2DM
3. Overt vascular or renal disease, CVD
4. OSA

# E S GUIDELINES PCOS 2013

## 3- Treatment

3.1 - Hormonal contraceptives (HC) – First Line management for menstrual abnormalities and hirsutism/acne of PCOS

3.2 - Screen for contraindications of HCs.:

- DVT, breast cancer

3.3 - Exercise therapy in management of overweight and obesity in PCOS

- 30 min moderate to vigorous exercise daily

3.4 - Weight loss strategies for adolescents and those overweight or obese

- Calorie-restricted diet

## 3.5 - Metformin NOT first line management for

- Cutaneous manifestations
- Prevention of pregnancy complications
- Obesity

## 3.6 - Metformin to be used in PCOS women if

- T2DM or IGT who fail lifestyle modification
- Menstrual irregularities present and HCs are contraindicated / not tolerated.

3.7 - Clomiphene citrate (or Letrozole) as first line treatment for anovulatory infertility in PCOS

3.8 - Metformin as adjuvant for infertility to prevent Ovarian hyperstimulation syndrome (OHSS) in women with PCOS undergoing IVF

3.9 - Insulin sensitizers e.g. inositols or thia-zolidine-diones use NOT recommended

3.10 - Statins **only** recommended in PCOS if patient meet current indications for statin therapy.

## 3.11 - Treatment of **adolescents**

1. HCs first-line treatment with suspected PCOS
2. Lifestyle therapy (calorie-restricted diet and exercise) also first-line if overweight/obesity
3. Metformin use to treat IGT/Metabolic syndrome
4. Duration not determined

## 3.12 - Start HCs in pre-menarchal girls with hyperandrogenism and advanced pubertal development

- ≥ Tanner stage IV breast development

# Summary & conclusions



## Diagnosis of PCOS

- Follow Rotterdam criteria in adults
- Difficult diagnosis in adolescents & perimenopausal/menopausal women

# Associated comorbidity and evaluation



1. Document cutaneous manifestations
2. Preconceptual assessment to prevent pregnancy complications
3. Look for other causes of infertility in couple
4. Screening for anovulation, inc. adiposity, depression, anxiety, OSA, IGT/T2DM, CVD risk factors
5. No screening needed for endometrial cancer, NAFLD, NASH
6. No specific intervention to prevent PCOS in offspring

# SUMMARY- Treatment



1. HCs first line therapy for PCOS in adults, adolescents and pre-menarchal girls with suspected PCOS

2. Lifestyle modifications first line therapy in obese/overweights

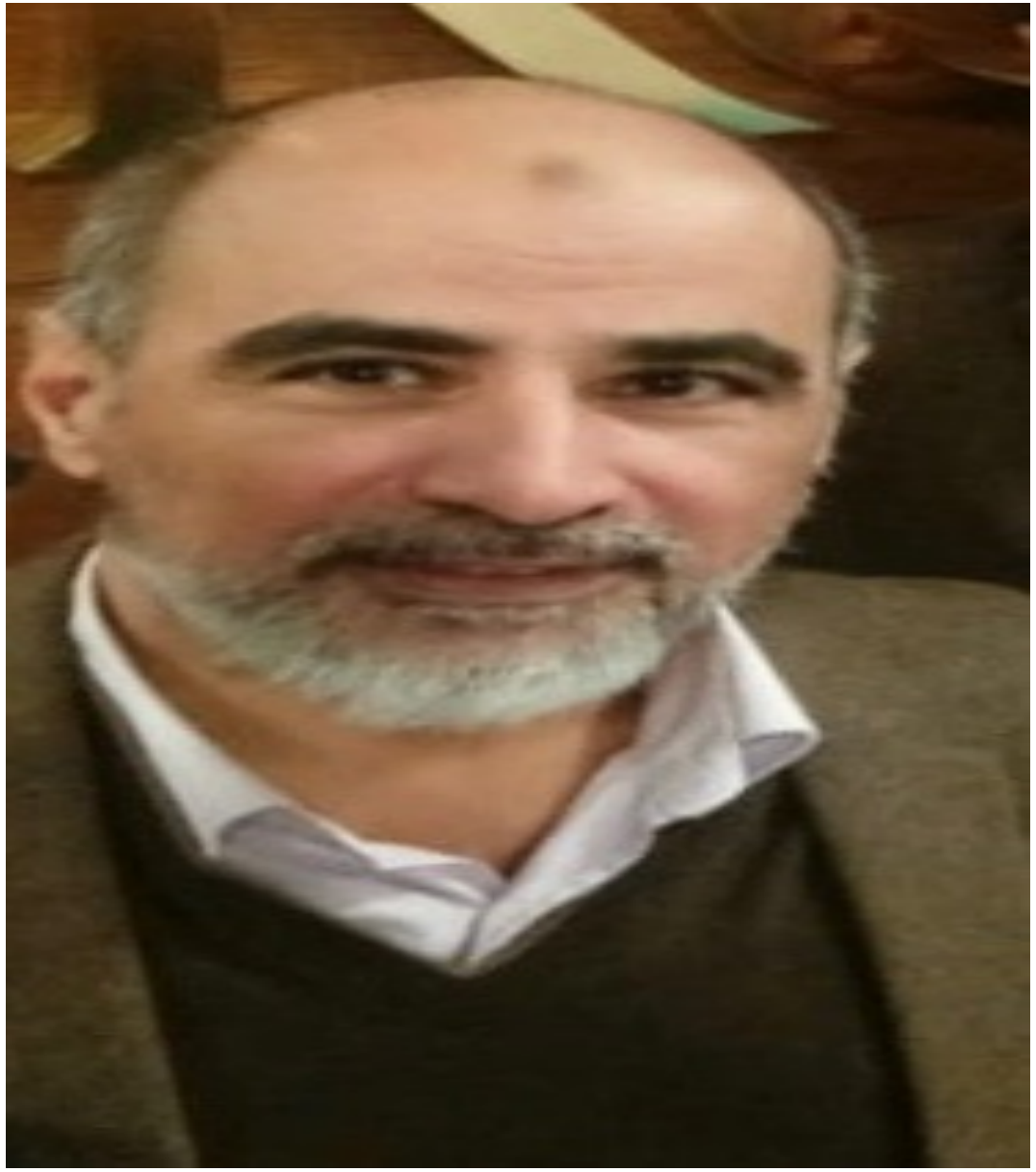
3. Metformin use recommended only when :

   a) PCOS with T2DM/IGT who fail lifestyle modifications
   b) Menstrual irregularity with contraindication for HCs
   c) Adjuvant therapy to prevent OHSS in PCOS women undergoing IVF
   d) In Adolescents to treat IGT/ Metabolic syndrome

4. Clomiphene citrate or Letrozole first line therapy for anovulatory infertility in PCOS

5. Statins only used if indication for statin therapy present

6. Insulin sensitizers e.g. inositols & TZDs not recommended in PCOS



# Thanks for attention