

Polycystic Ovarian Syndrome

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Polycystic Ovarian Syndrome
(PCOS) is the most common
cause of female infertility.

Disease Background

- PCOS affects up to 1 in 5 woman of reproductive age
- PCOS is a problem associated hormone imbalance
- Associated with other clinically important conditions including:
 - Obesity
 - Type 2 Diabetes Mellitus
 - Cardiovascular Disease
 - Subfertility / Infertility
 - Mood and Eating Disorders

Causes of PCOS

Genetic Influence

- 20% to 40% of female relatives of women with PCOS expressing the syndrome
- Believed to be inherited as a complex disorder
 - Several genetic variants are present that each contribute a moderate effect
 - Variants combine with risk-increasing lifestyle and environmental factors

Environmental Factors

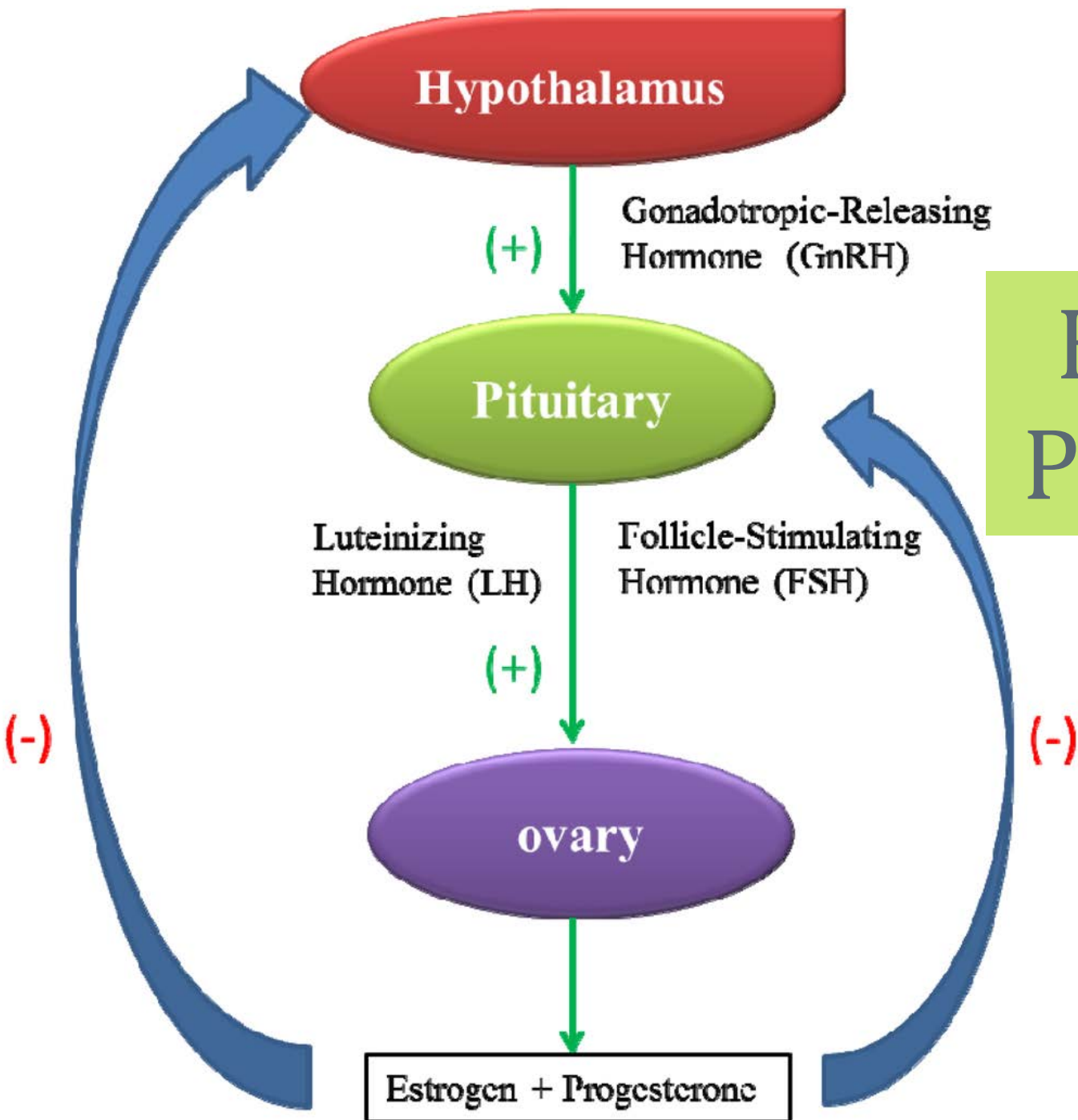
- Lifestyle profoundly affects the expression of PCOS
- Weight gain and obesity worsen reproductive and metabolic abnormalities of PCOS
- Hormone disrupting chemicals from the environment, such as BPA, might cause PCOS-like abnormalities

Model for Development of PCOS

Model for Development of PCOS

- Complete mechanistic and biochemical processes of PCOS remain unknown
- Study using rhesus monkeys show that increased levels of prenatal androgens result in PCOS-like symptoms

Hormone Production



Hypothalamus

Gonadotropic-Releasing Hormone (GnRH)

(+)

Pituitary

Luteinizing Hormone (LH)

Follicle-Stimulating Hormone (FSH)

(+)

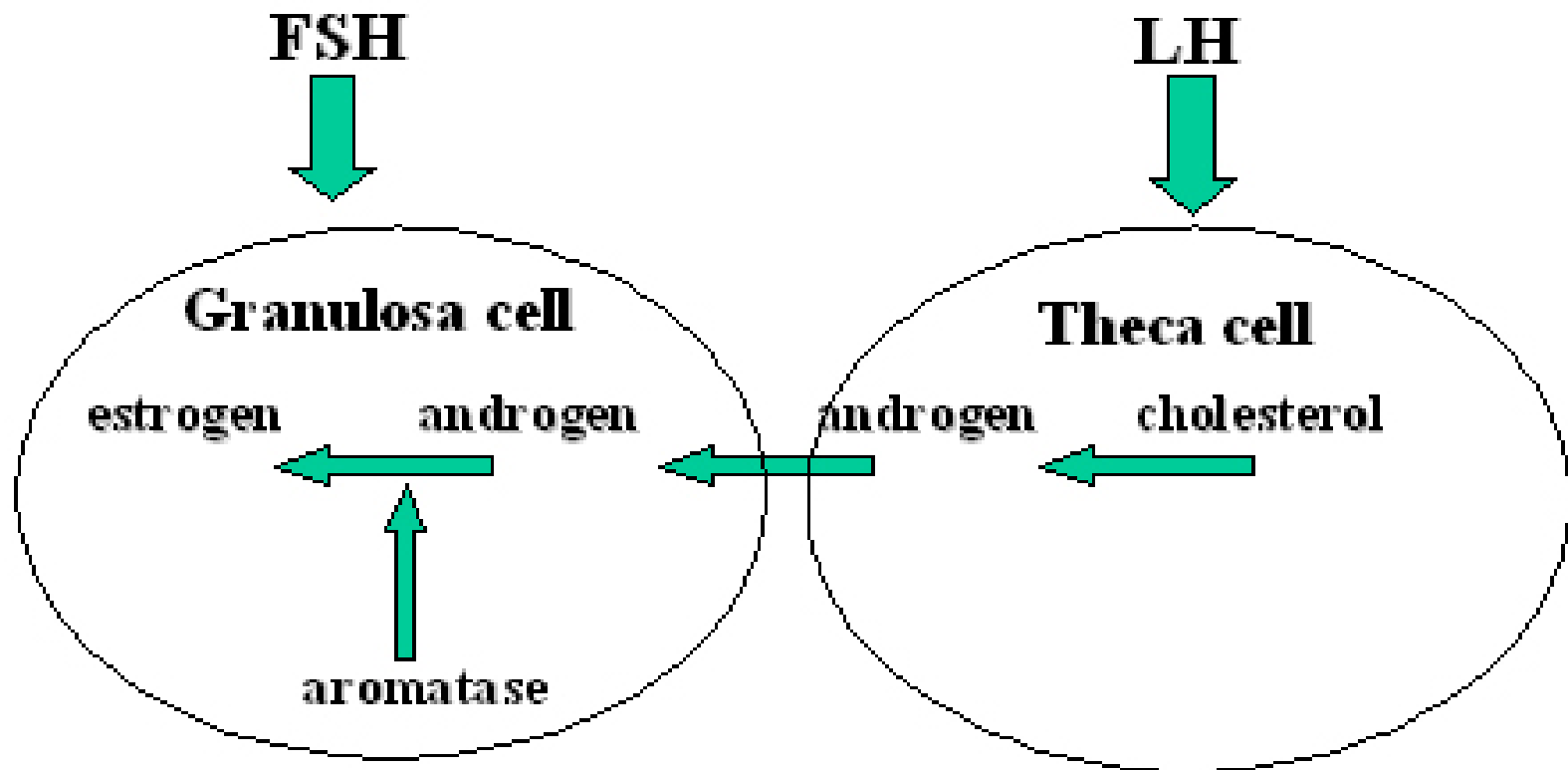
ovary

Estrogen + Progesterone

(-)

(-)

Figure 3



Consequences of High Androgens

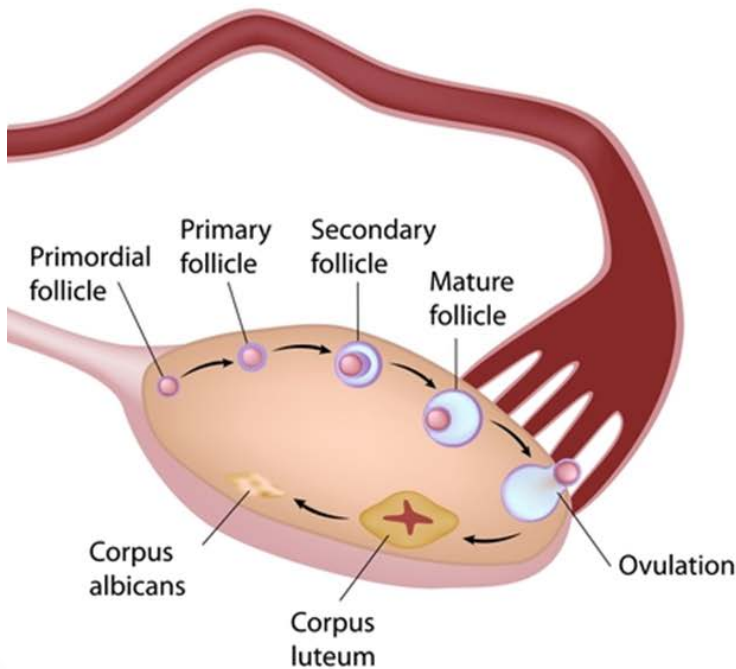
Hyperandrogenism

- Luteinizing Hormone (LH) Hypersecretion
- Hyperandrogenism
- Hirsutism
- Acne

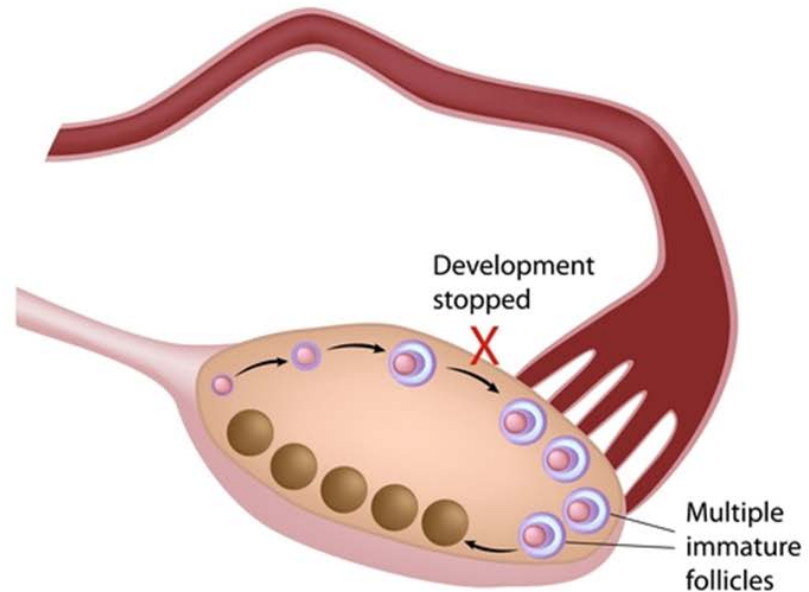


Anovulation

- Polycystic Ovaries
- Ovulatory and Menstrual Dysfunction
- Subfertility / Infertility



Normal Ovary



Polycystic Ovary

Metabolic Conditions

- Obesity
- Insulin resistance and Hyperinsulinemia
- Dyslipidemia
- Type 2 Diabetes Mellitus
- Cardiovascular Disease

PCOS and Insulin

- **High androgen levels** → Dysfunctional adipogenesis → Increased free fatty acids
- Fatty acid breakdown → Deactivation of insulin receptor pathway
- Deactivation of receptor pathway → Glucose Transporter 4 not present in the membrane = **Insulin resistance**
- Insulin resistance → High levels of insulin in blood → **Even higher androgen levels**

Psychological Conditions

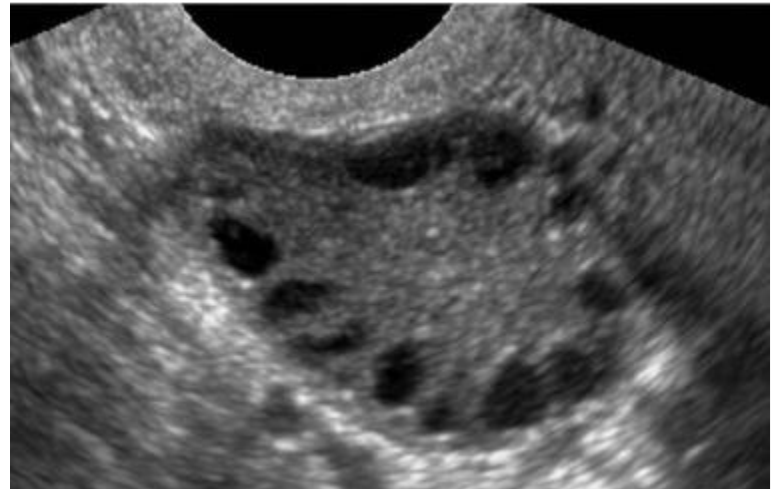
- Depression
- Anxiety
- Eating disorders
- Poor self-esteem
- Negative body image
- Psychosexual dysfunction

PCOS and Depression

- Women with PCOS have an increased prevalence of mood disorders
- 26-40% have depression
 - In part owing to obesity, hirsutism and infertility
 - Relationship between testosterone levels and depression scores
- Depression can effect the implement of successful lifestyle changes that are critical in PCOS
- Insulin resistance improves with treatment of depression

Diagnosing PCOS

- Diagnosis of exclusion
- Currently there are three diagnostic classification systems that are used when diagnosing PCOS
 - National Institutes of Health Criteria
 - Rotterdam Consensus Criteria
 - Androgen Excess and PCOS Society



Treatment

- Treatment of PCOS must be tailored to the specific needs of each patient
- Goals of therapy may include:
 - Reducing hyperandrogenic symptoms
 - Inducing ovulation
 - Regulating menstruation
 - Preventing Type 2 Diabetes and Cardiovascular Disease

Conclusion

- PCOS is a major threat to women's health
- PCOS carries considerable long-term health risk
- Lack of unique diagnostic markers is preventing more accurate and successful diagnosis and treatment of PCOS
- Further research is needed in this complex condition



SUPPORT

POPS

AWARENESS

Sources

- http://go.galegroup.com/ps/i.do?id=GALE%7CA252945417&v=2.1&u=wylrc_uw_yoming&it=r&p=HRCA&sw=w&authCount=1
- <http://www.biomedcentral.com/1741-7015/8/41>
- http://ac.els-cdn.com/S093947531300118X/1-s2.0-S093947531300118X-main.pdf?_tid=dc41019a-ec87-11e4-aa5f-00000aacb35f&acdnat=1430103078_898d301deb70228f3e67001b788343fd
- http://ac.els-cdn.com/S0303720713000361/1-s2.0-S0303720713000361-main.pdf?_tid=797f903a-ec87-11e4-9648-00000aacb35d&acdnat=1430102913_879e606bd715006dc15ad05768ccd86c
- http://ac.els-cdn.com/S0015028200016629/1-s2.0-S0015028200016629-main.pdf?_tid=45c58f66-ec86-11e4-95e1-00000aab0f27&acdnat=1430102396_4dace3e075109b64a6dc950df9844b5a
- <http://web.b.ebscohost.com/ehost/pdfviewer/pdfviewer?sid=cd148365-3189-4c14-bde9-8eb2a2576e56%40sessionmgr198&vid=1&hid=125>
- http://ac.els-cdn.com/S1472648310616446/1-s2.0-S1472648310616446-main.pdf?_tid=da532950-ec85-11e4-ae37-00000aacb360&acdnat=1430102216_b2e43923bde1a539d6361e29e1fec3b6
- http://ac.els-cdn.com/S002072920300050X/1-s2.0-S002072920300050X-main.pdf?_tid=01a6d89a-ec85-11e4-adaf-00000aacb360&acdnat=1430101853_b653713a0252f7082ad3a4e0cffa41af