

HORMONES



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- **PhD in Medical Biochemistry**

- ▶ Department of Clinical Biochemistry, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.

- **M.Sc. in Medical Biochemistry**

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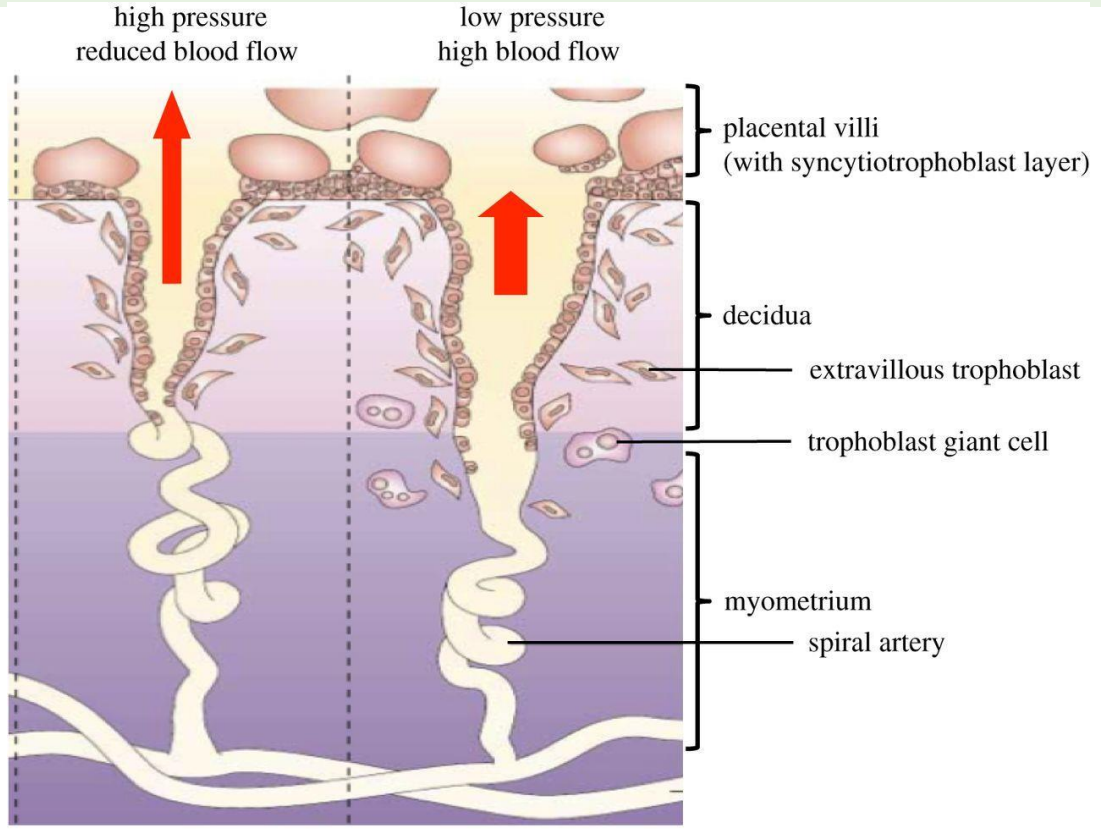
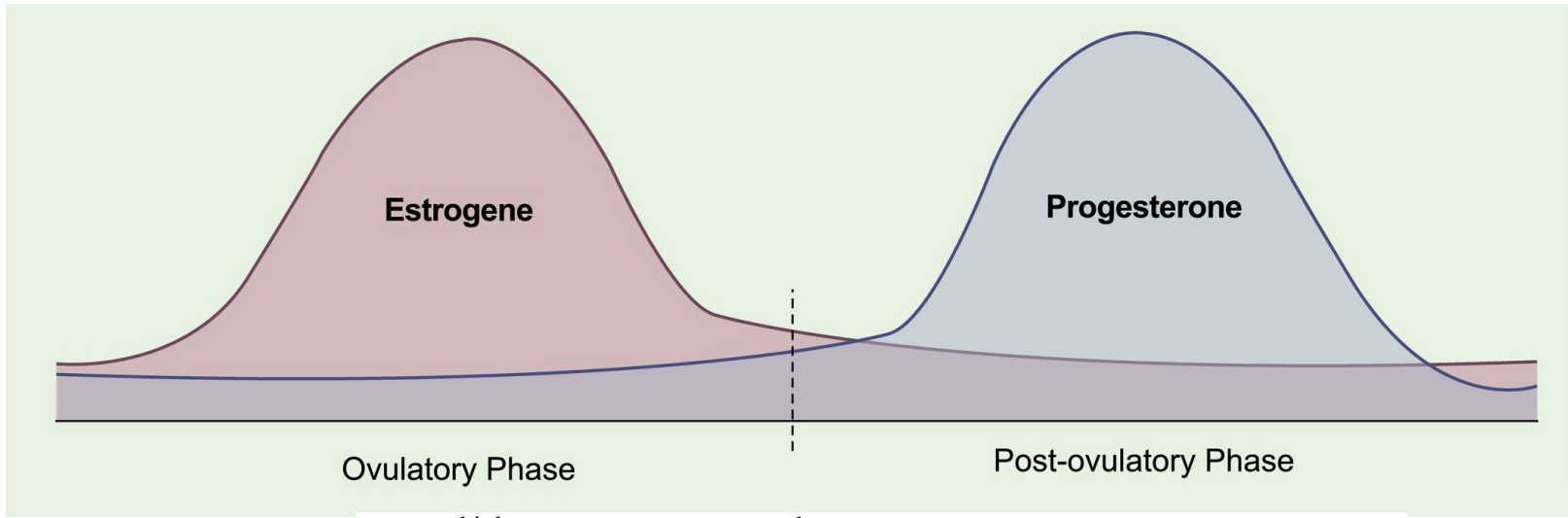
- **B.Sc. in Medical Lab Sciences**

- Golestan University of Medical Sciences, Gorgan, Iran

هورمون های استروئیدی

3

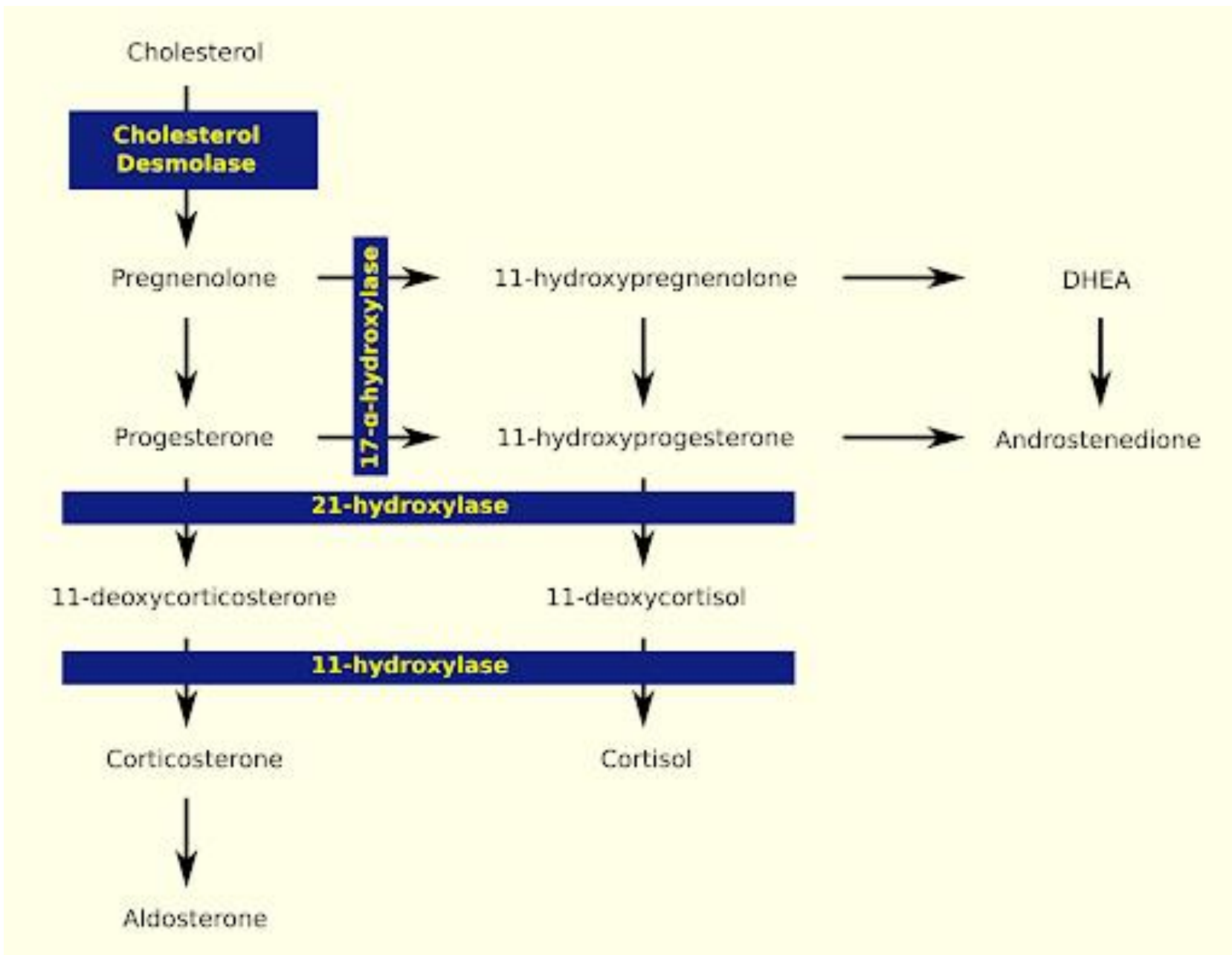
Hypertension in pregnancy



Dr. Hossein Javid/ Ph.D.

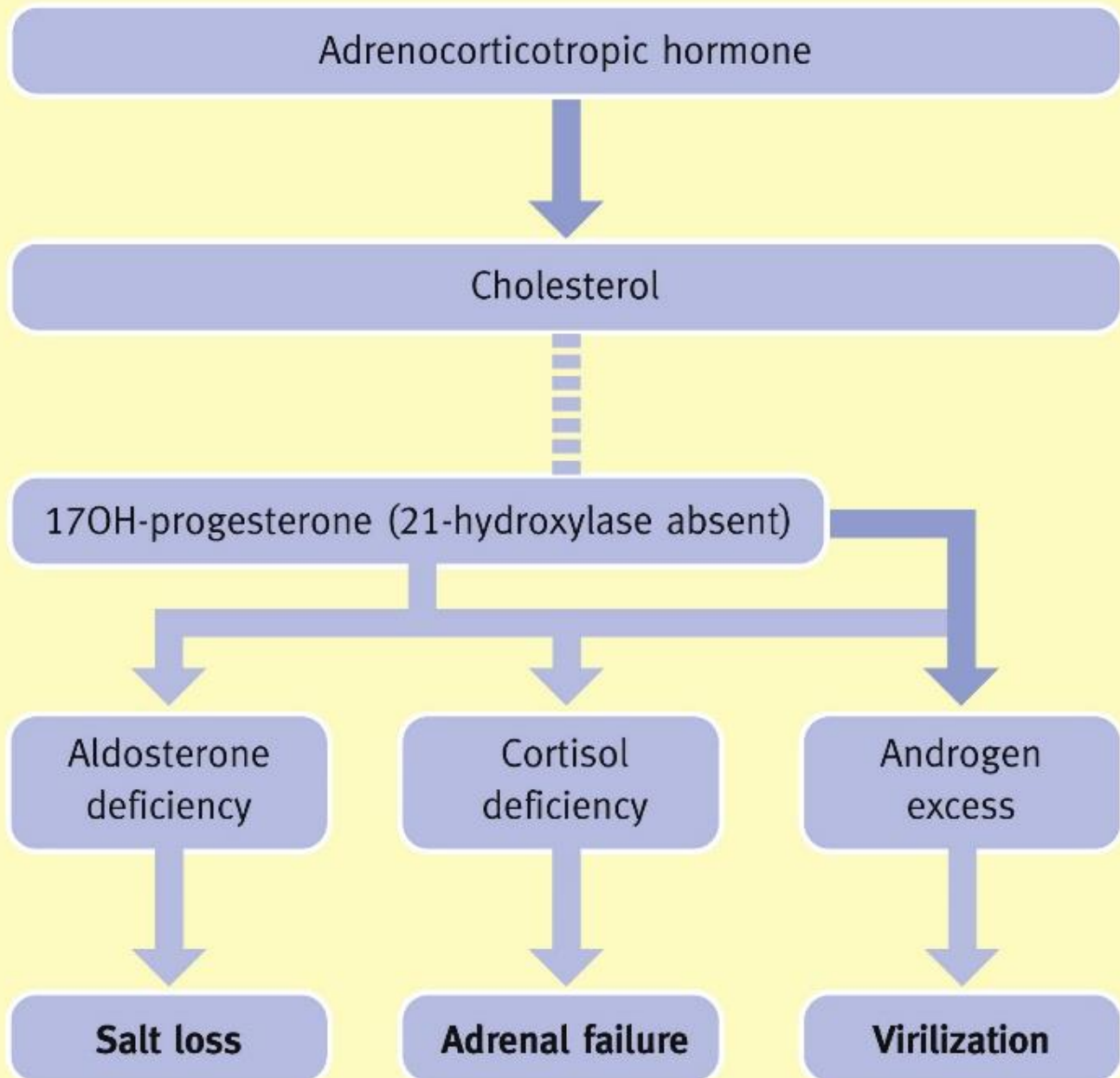
pregnancy with fetal growth restriction

normal pregnancy



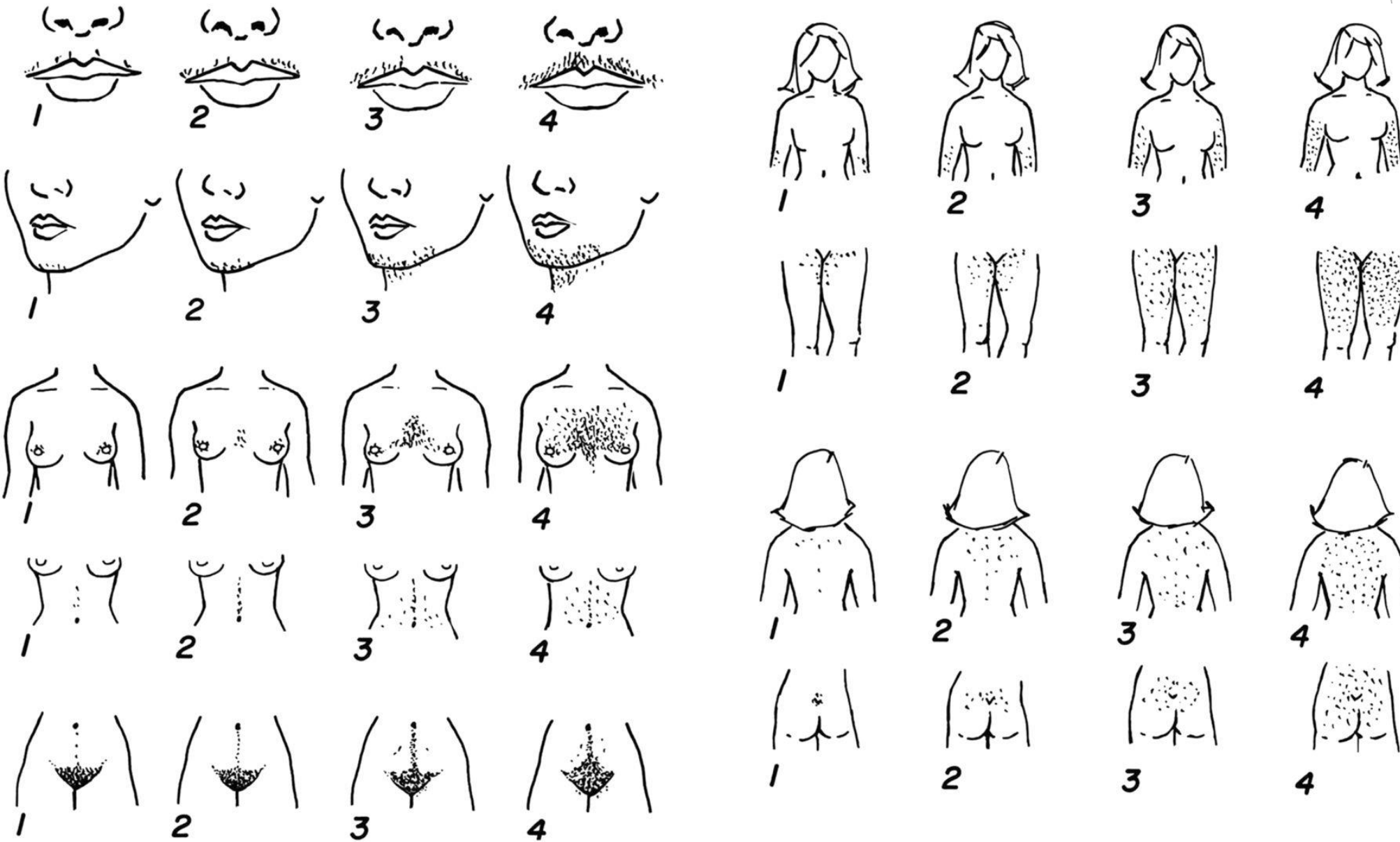
CAH

Pathophysiology of congenital adrenal hyperplasia



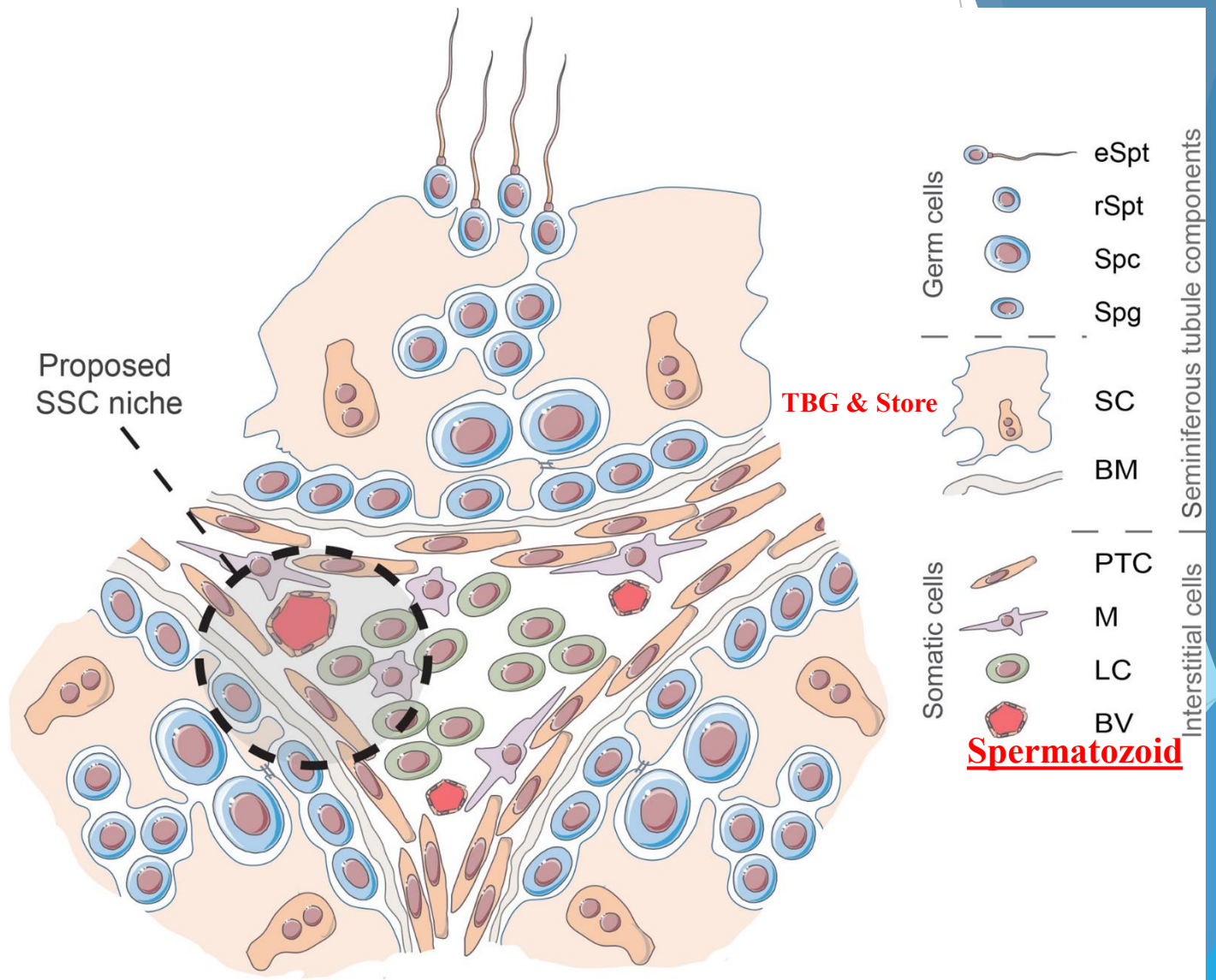
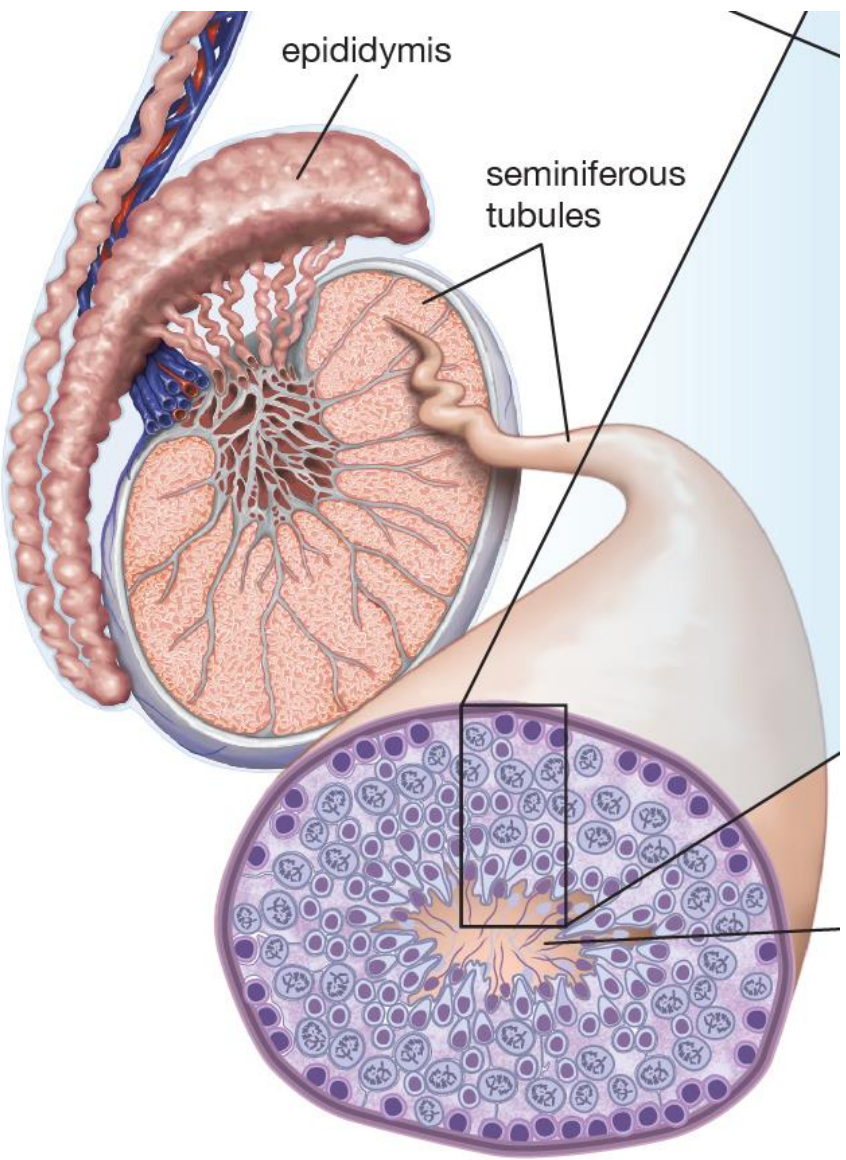
CAH

Hyperandrogenism

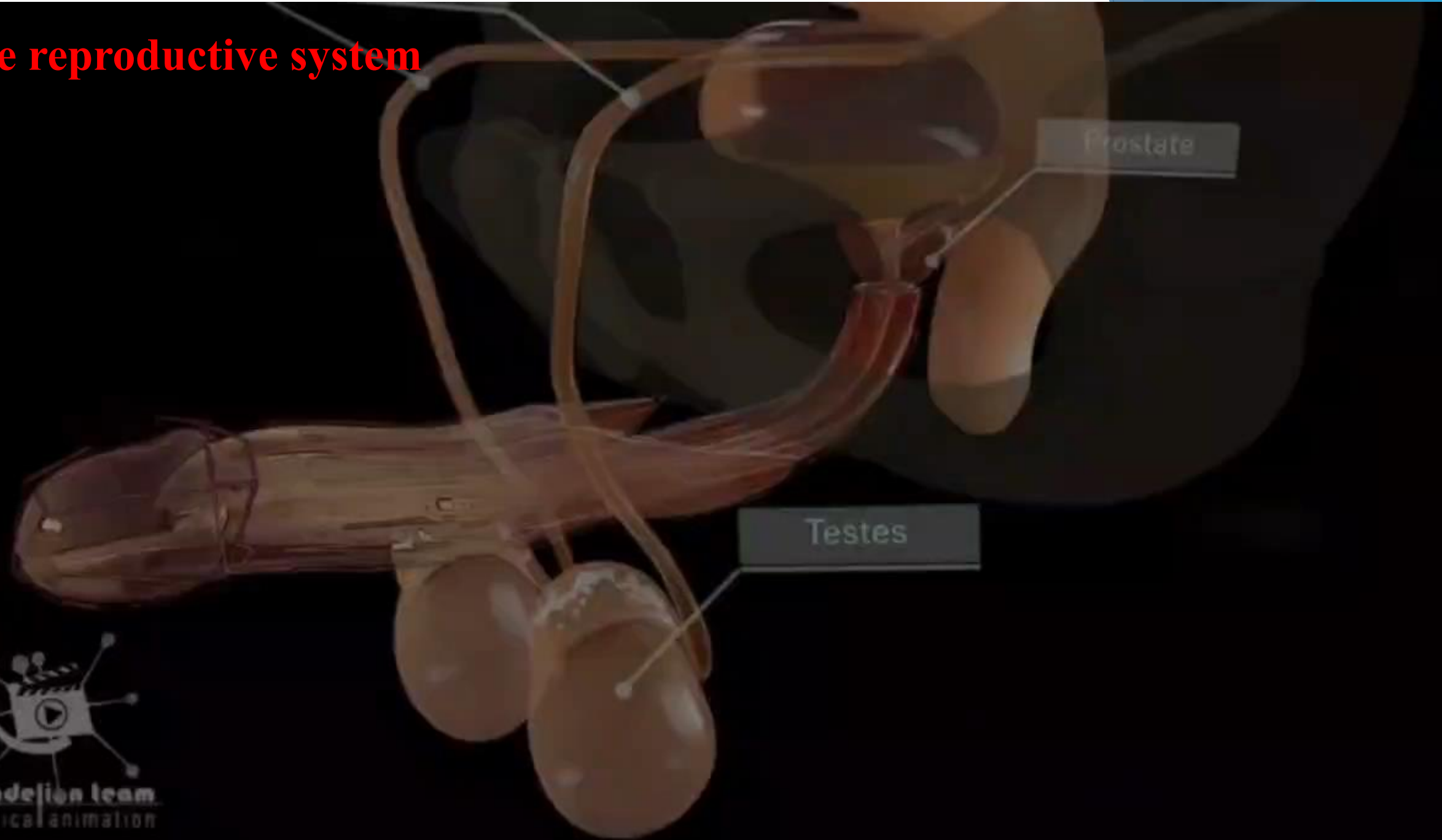


Hairy
Men's beard
Irregular menstruation
PCOS

Testis



Male reproductive system



Testosterone

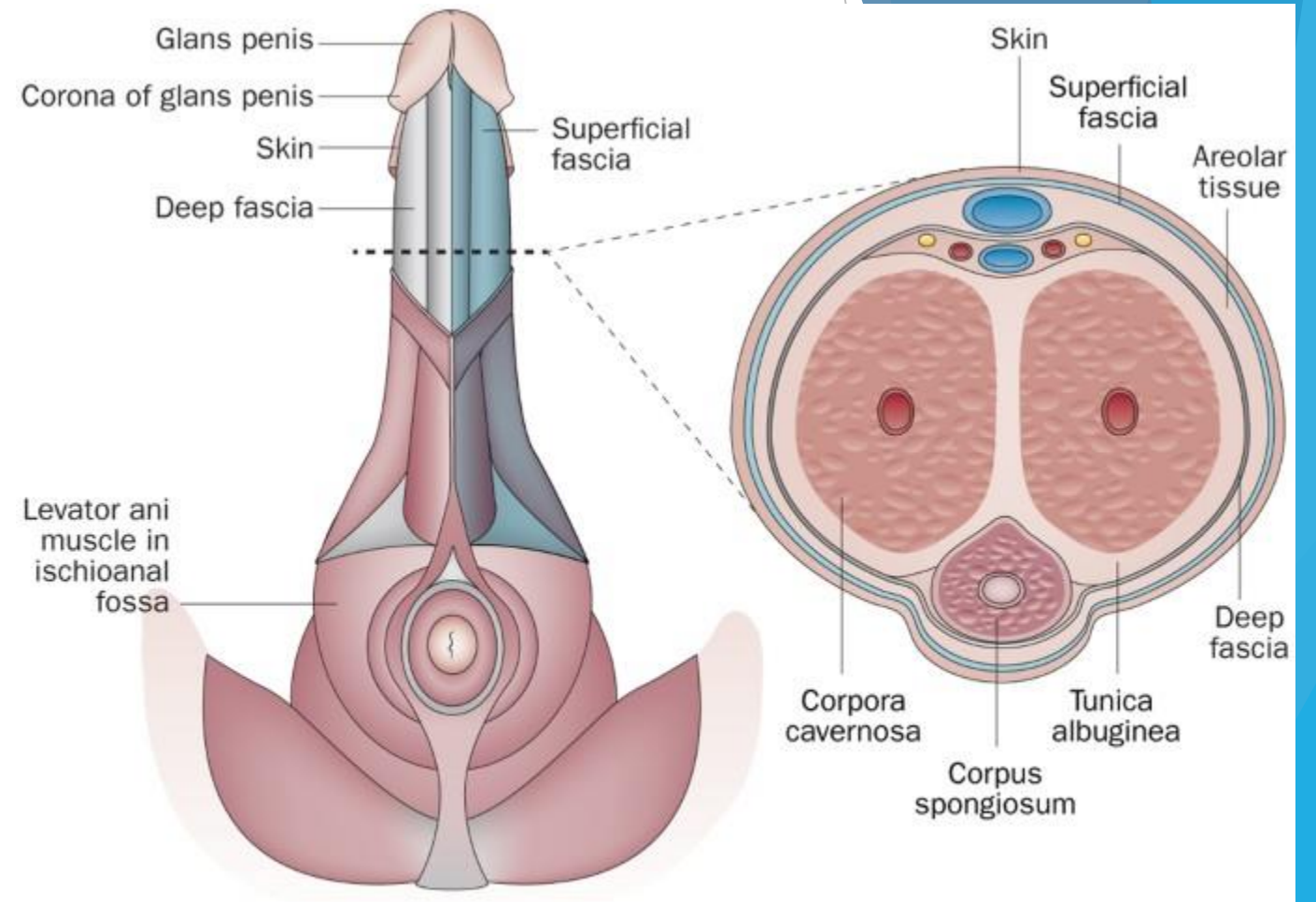
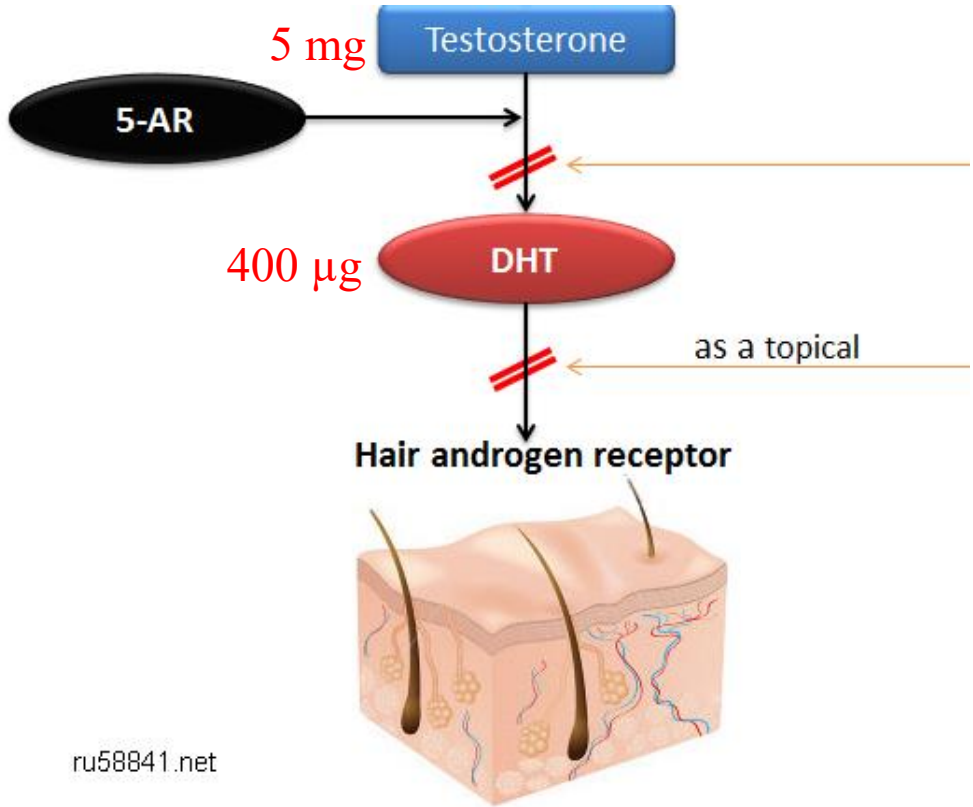


Estradiol

Late puberty in boys
Gynecomastia

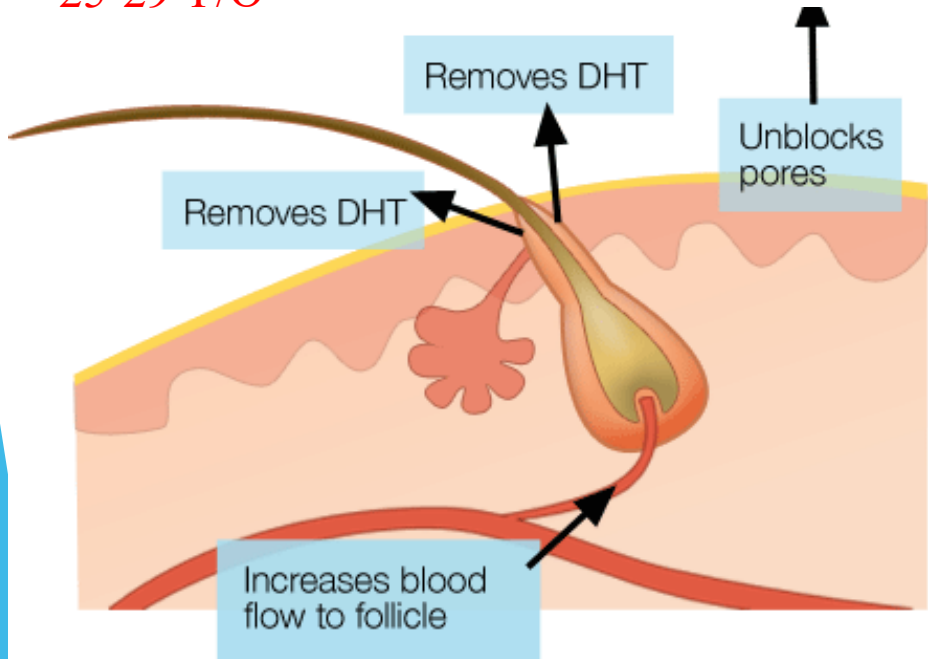


It is converted to ketosteroids in the liver

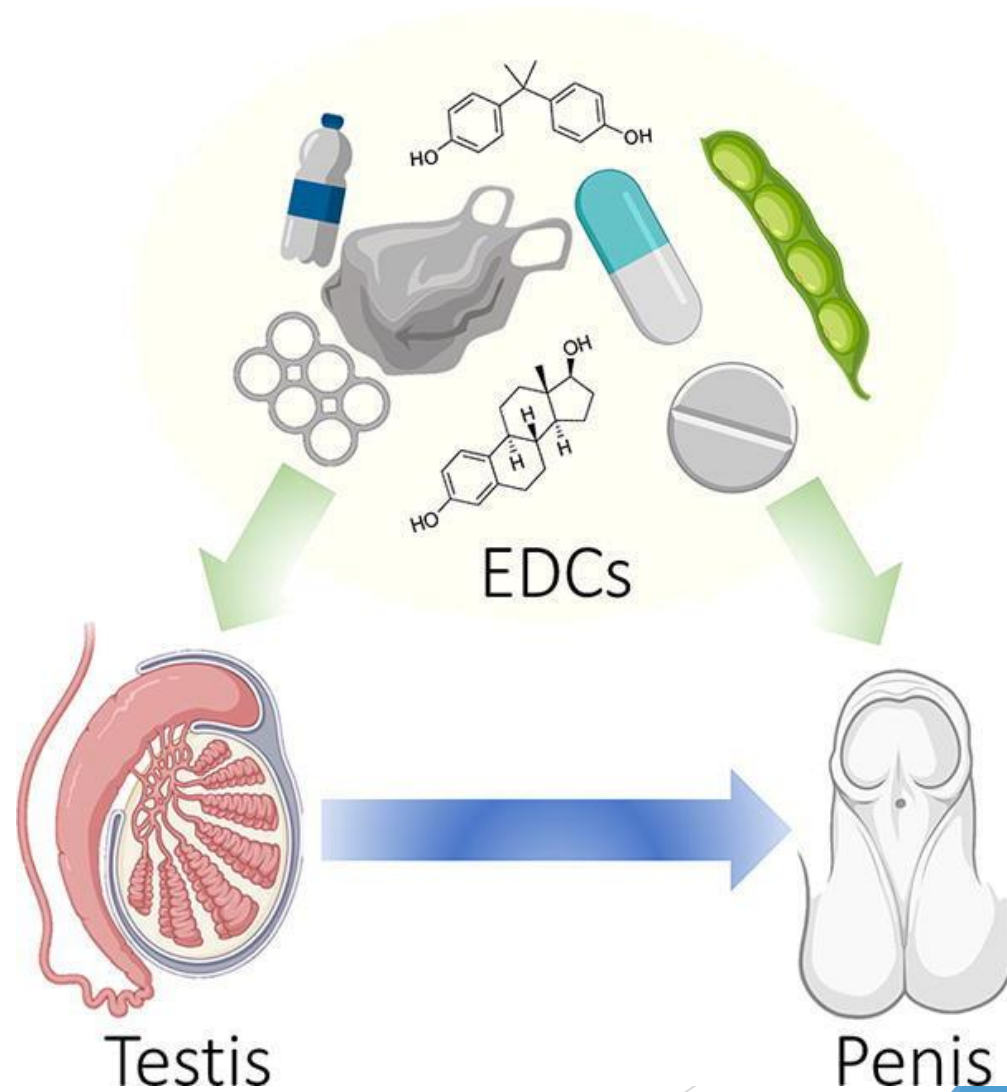




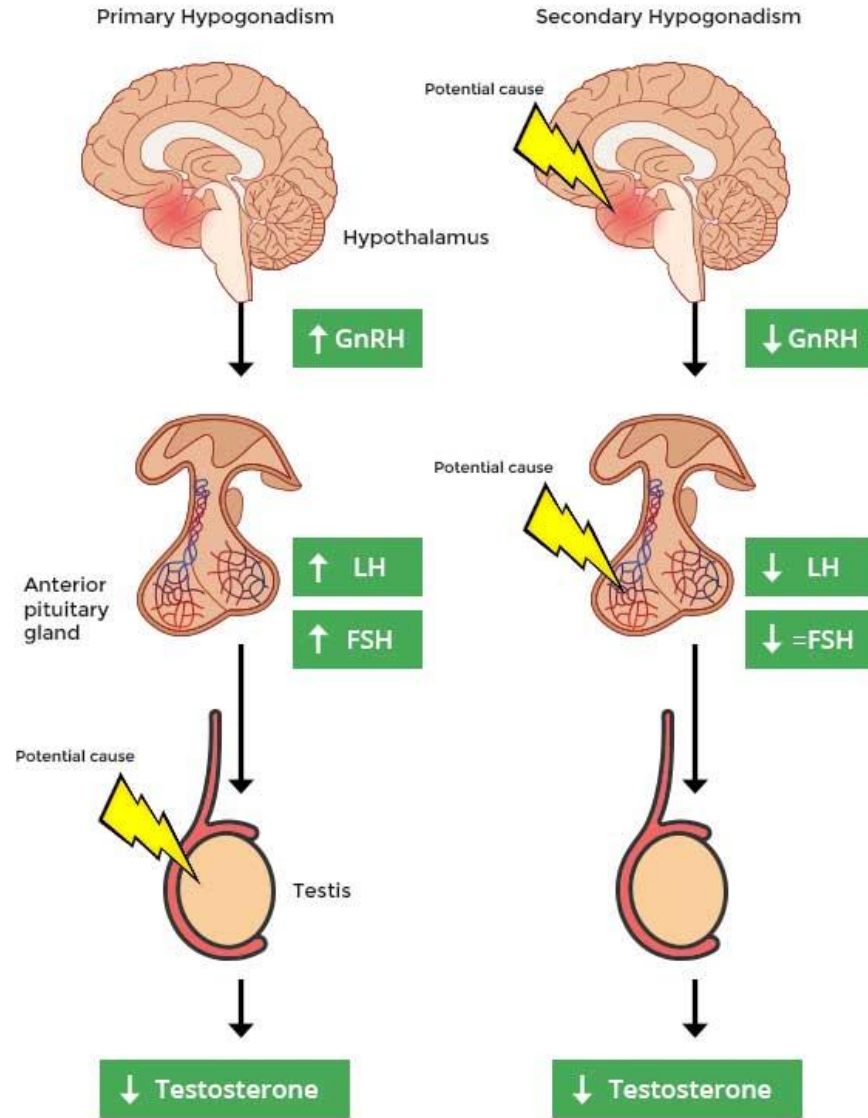
25-29 Y/O



Dr. Hossein Javid/ Ph.D. of Medical Biochemistry, Assistant Professor, VUMS, Mashhad/Iran



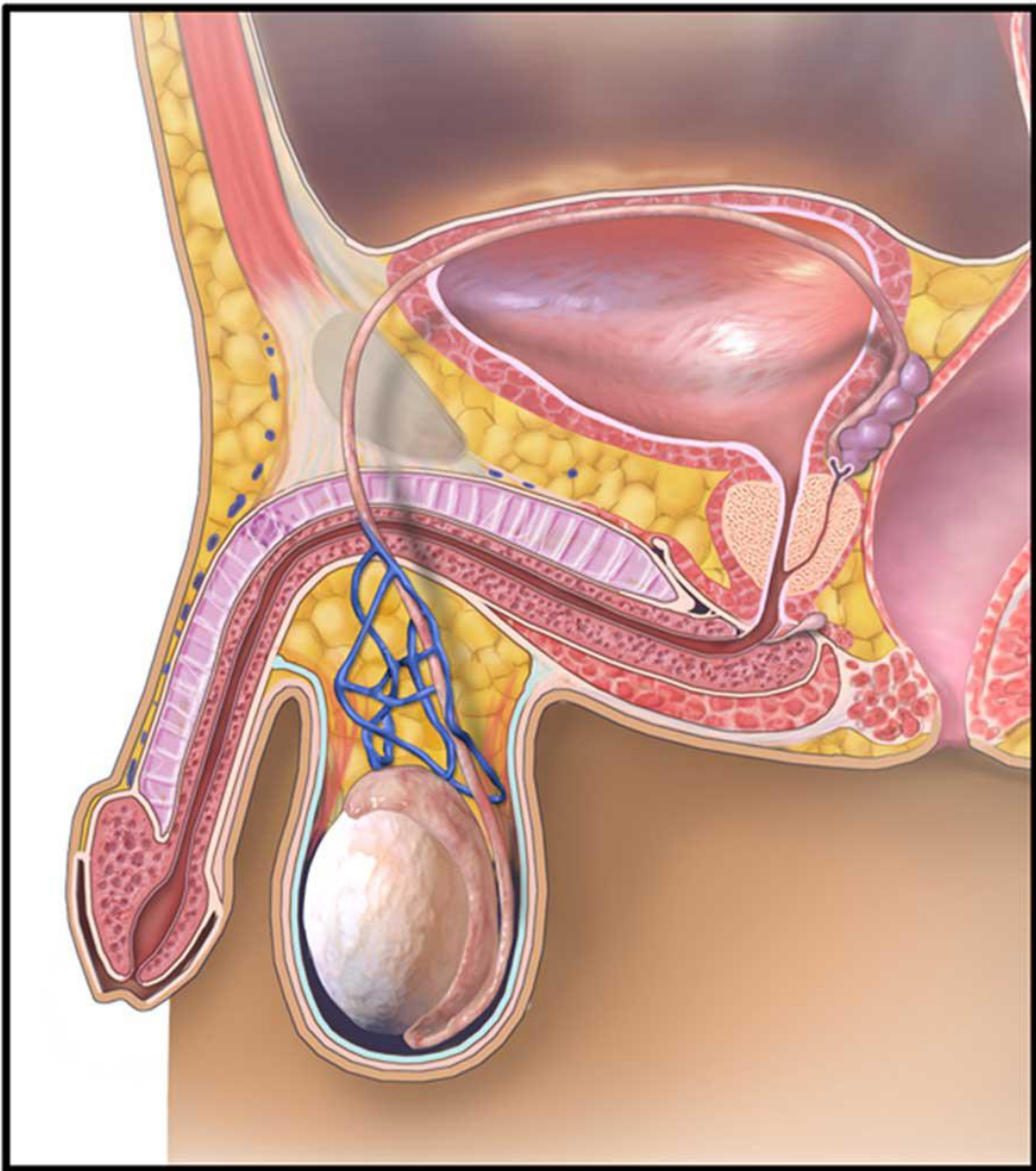
Hypogonadism



هیپوگنادیسم اولیه

نقص اولیه در بیضه ها
نارسایی در لوله های منی ساز
سندرم کلاین فیلتر
تروما، پرتودرمانی، واریکوسل
ارکیت
کریپتورکیدیسم

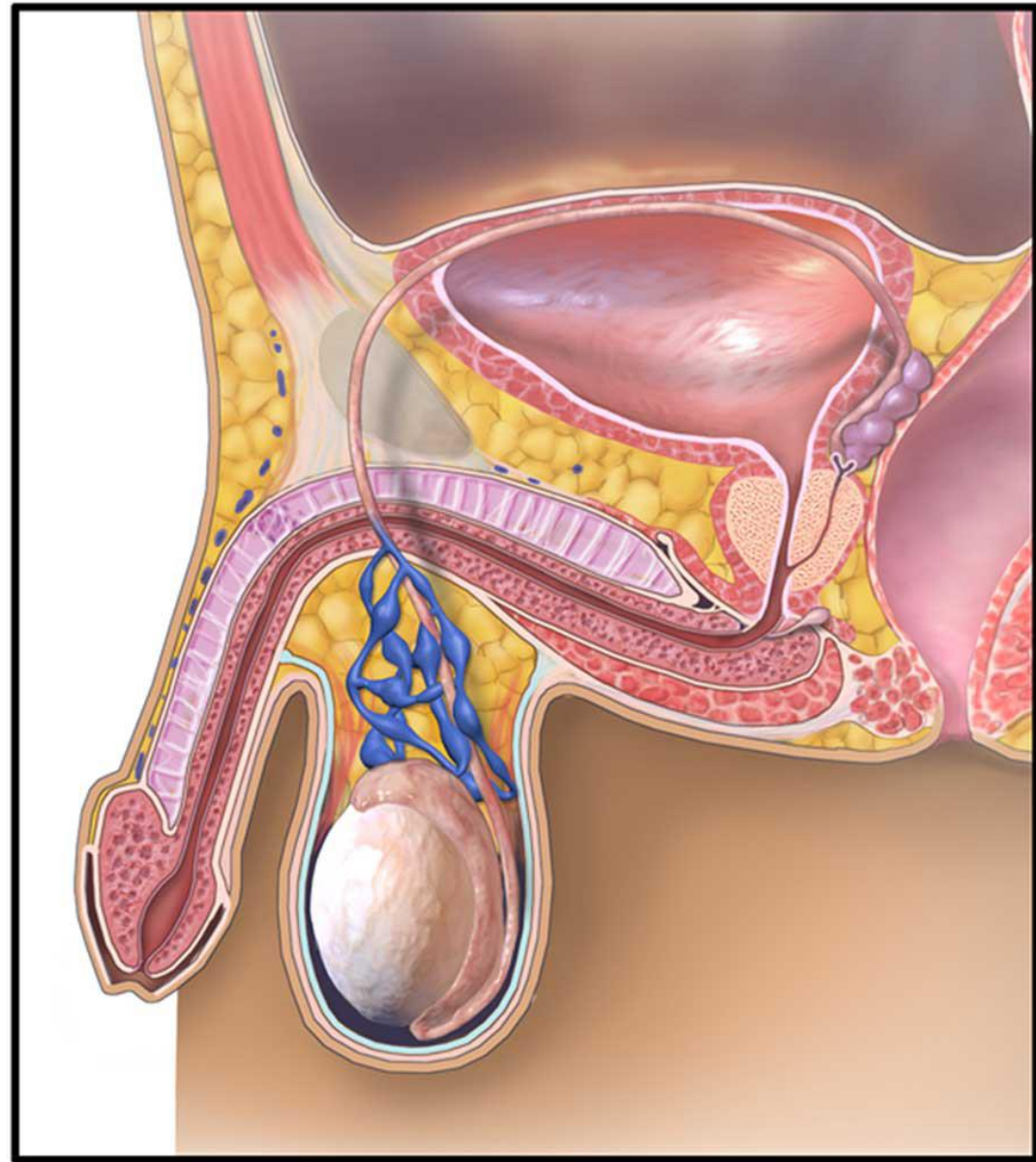




Normal



مجله تخصصی پیویو

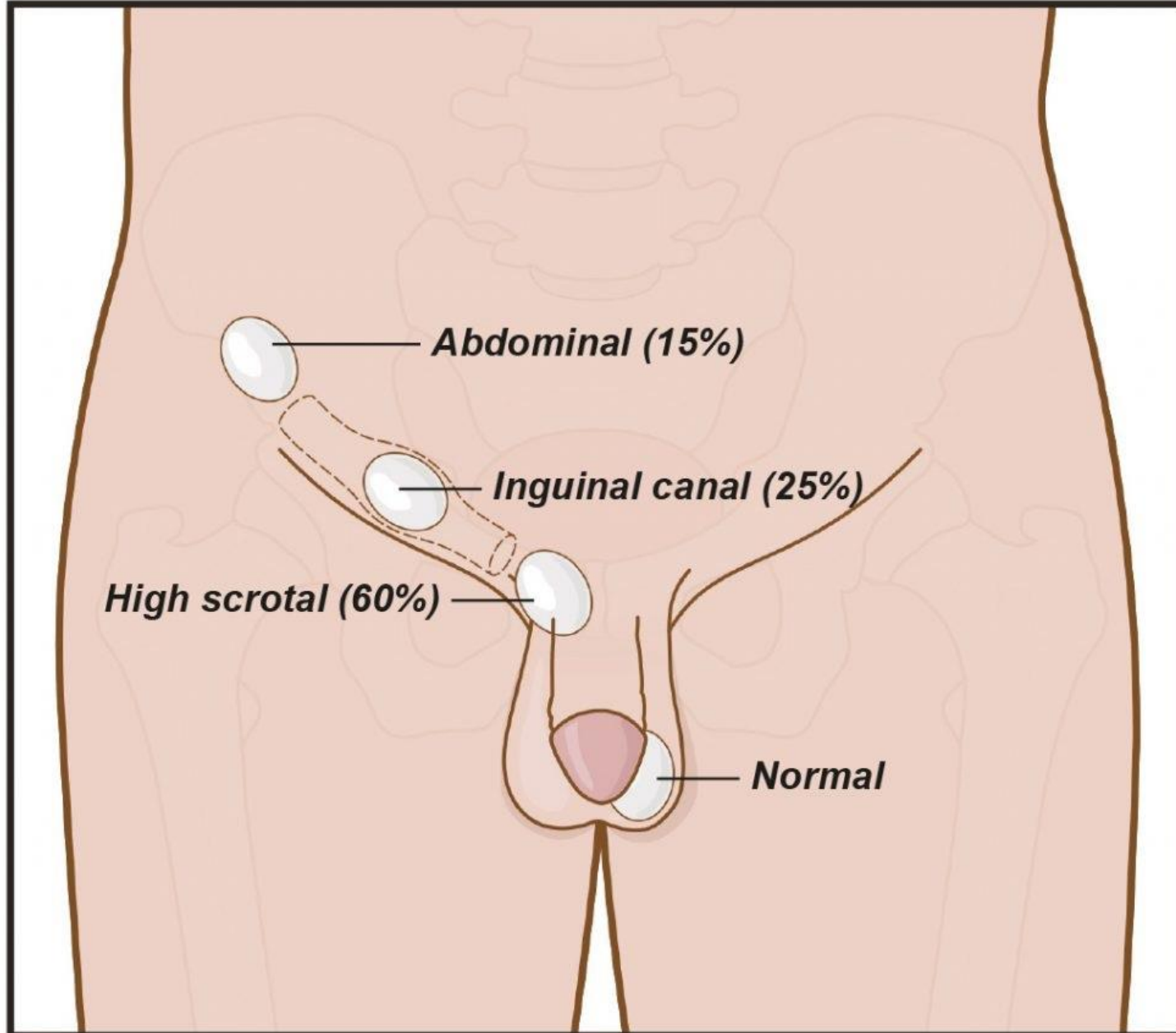


Varicocele



انیمیشن
دریچه
لانہ کیبوتری

کریپتورکیدیسم



هیپوگنادیسم ثانویه

Non-production of GnRH
Olfactory disorder

سندرم کالمن

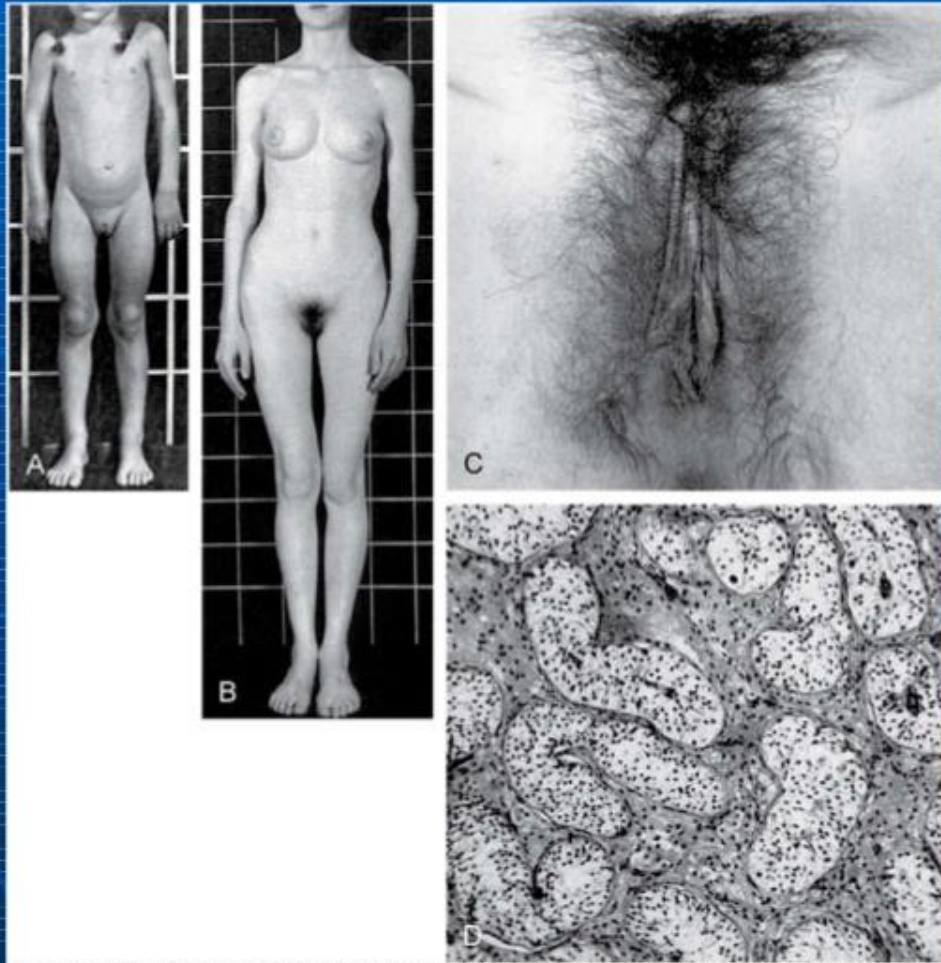
داروی آرام بخش، سوء تغذیه

ارثی

اكتسابی



Androgen Insensitivity Syndrome (Testicular Feminization Syndrome)



- Genetically **XY** male; looks female

Fig. 15-40. Patients with androgen insensitivity syndrome having 46,XY karyotypes and female external genitalia. A, Eleven-year-old patient. B, Seventeen-year-old patient. C, Photograph showing normal female external genitalia in patient in B. D, Photomicrograph of the cytoarchitecture of the testis removed from the inguinal canal of the patient in B showing Sertoli cell-lined seminiferous tubules. Germ cells are missing and the interstitial cells are hypoplastic.

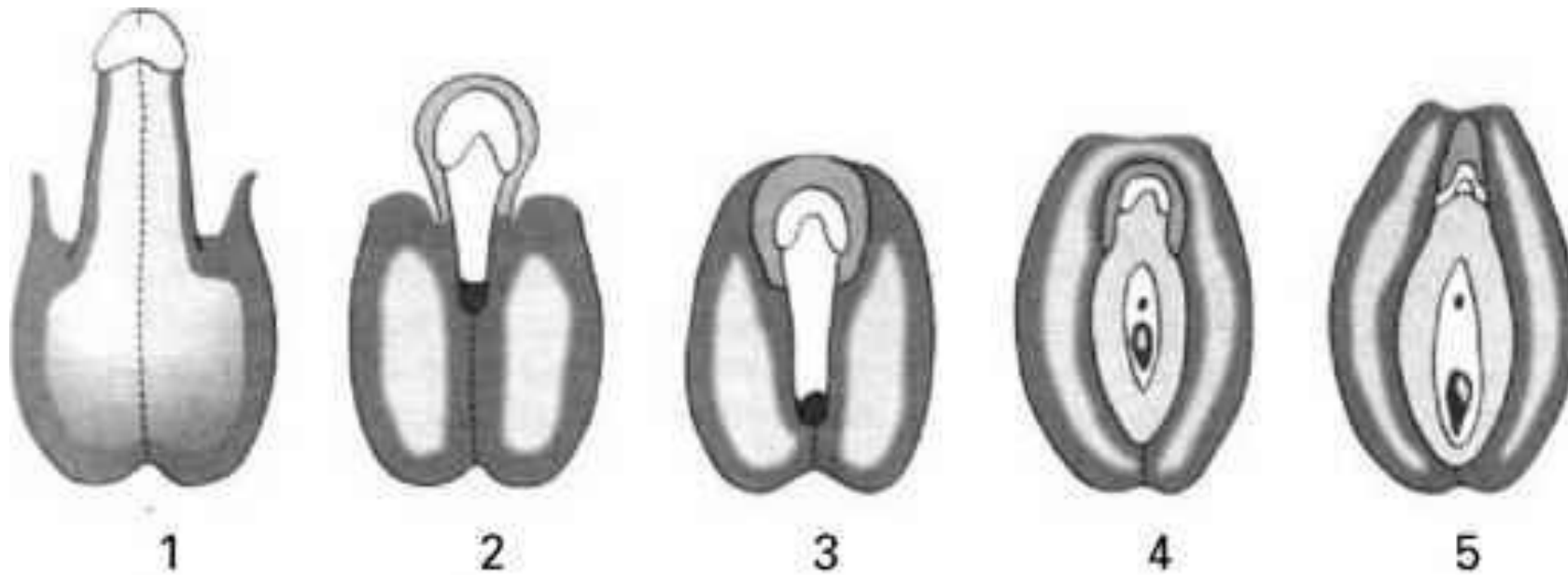
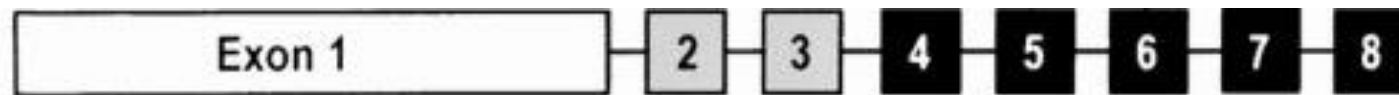


Fig. 3.3 Clinical grades of ambiguous genitalia. Virilization is diminished from grade 1 towards grade 5. According to Sinnecker *et al.* 1997.

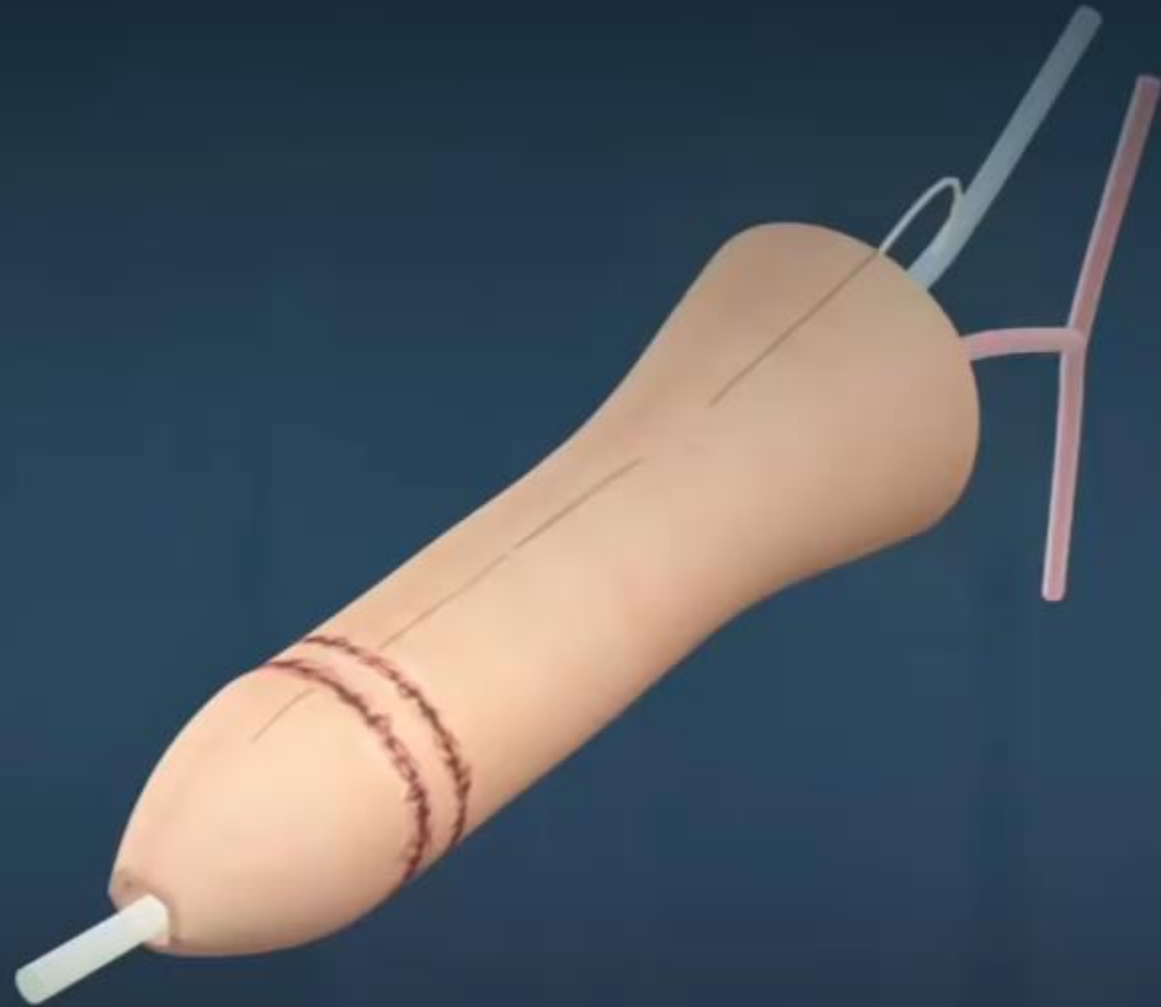


androgen receptor gene

Male to female reassignment surgery



Female to Male reassignment surgery



Andropause

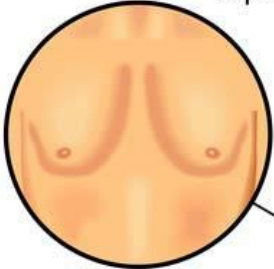
Symptoms and Complications



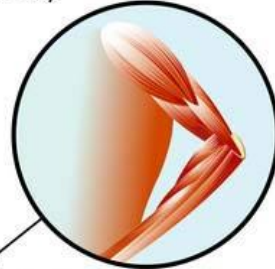
Decline in cognitive function,
depression,



Thinning hair,
hair loss,



Gynecomastia



Reduced muscle mass,
loss of muscle strength,



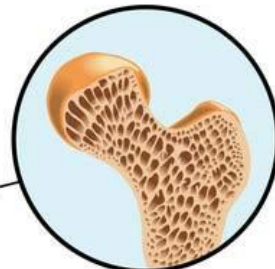
Loss of elasticity and
thinning of the skin



Increased fat mass,
abdominal obesity,



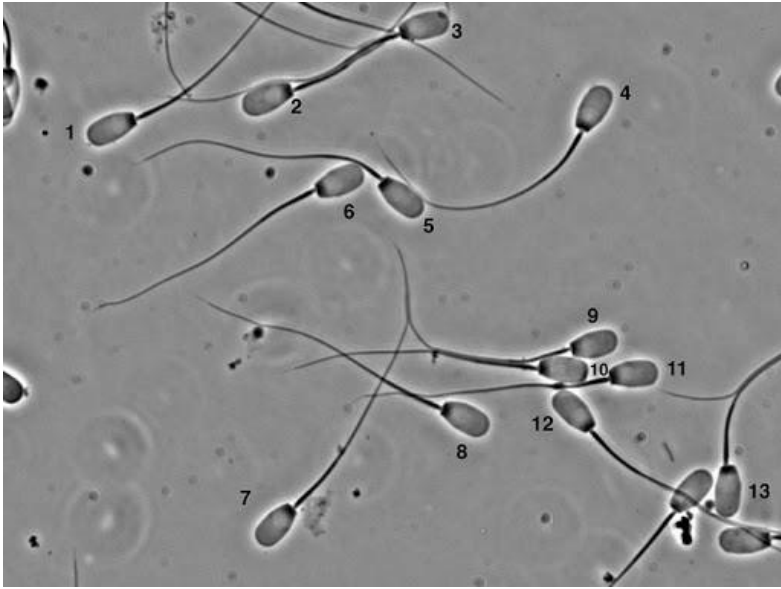
Testicular atrophy,
decreased sexual desire,
reduced levels of testosterone,



Reduction in bone mass,
osteoporosis risk,
fracture risk,

Andropause

Semen Analysis



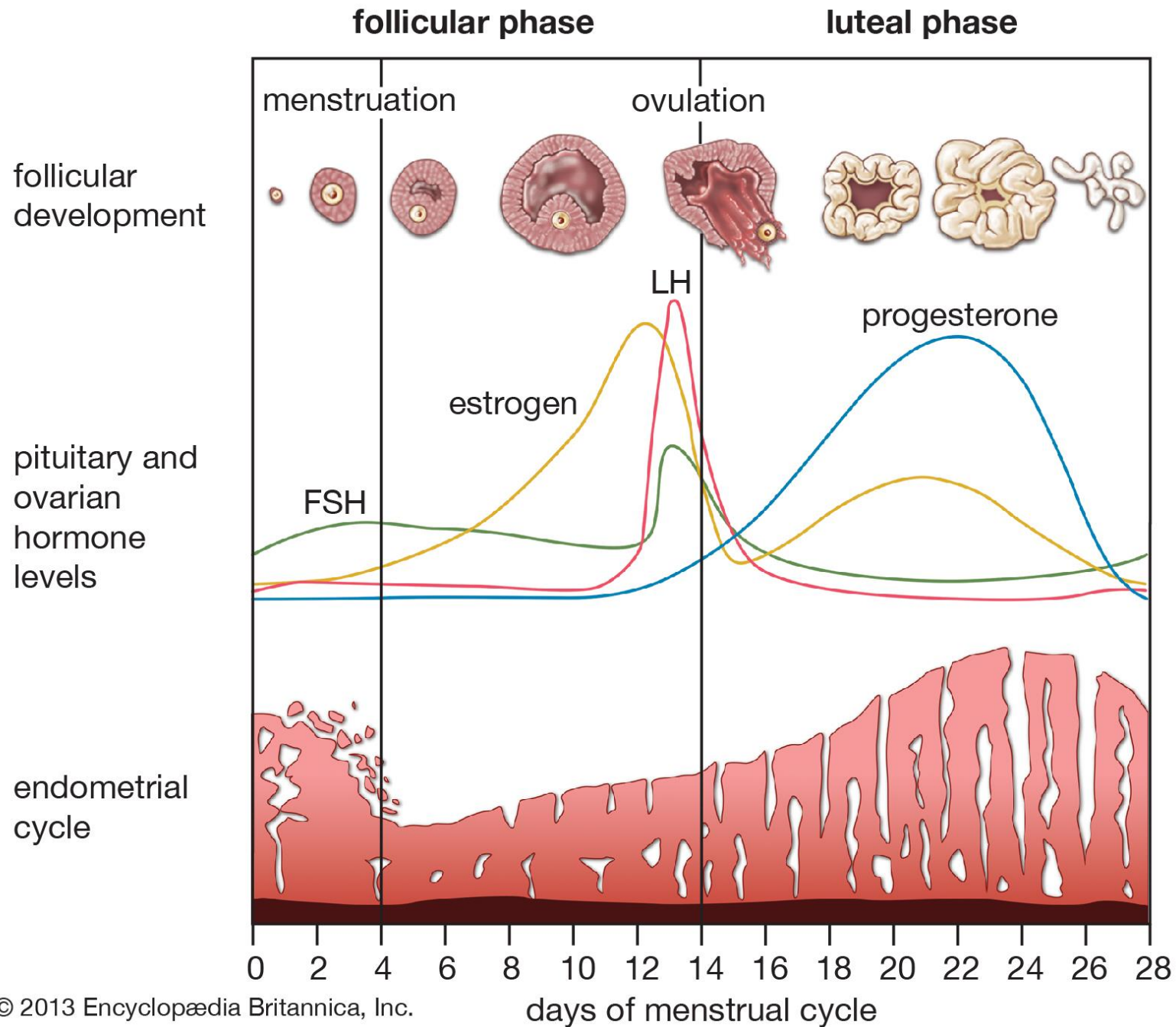
Testos= Healthy testicles
Testos= Testicle problem

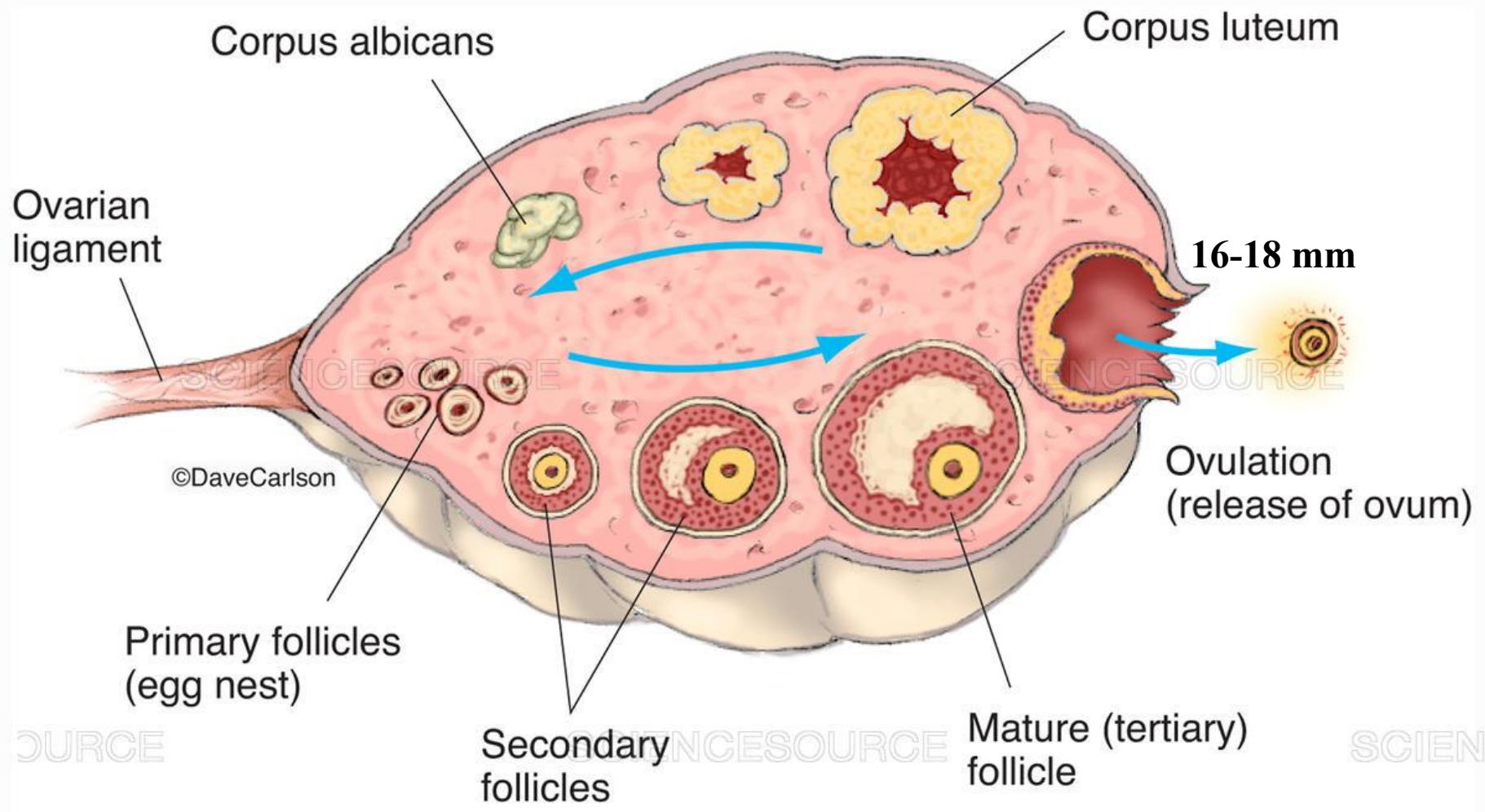


هرمون های جنسی زنانه

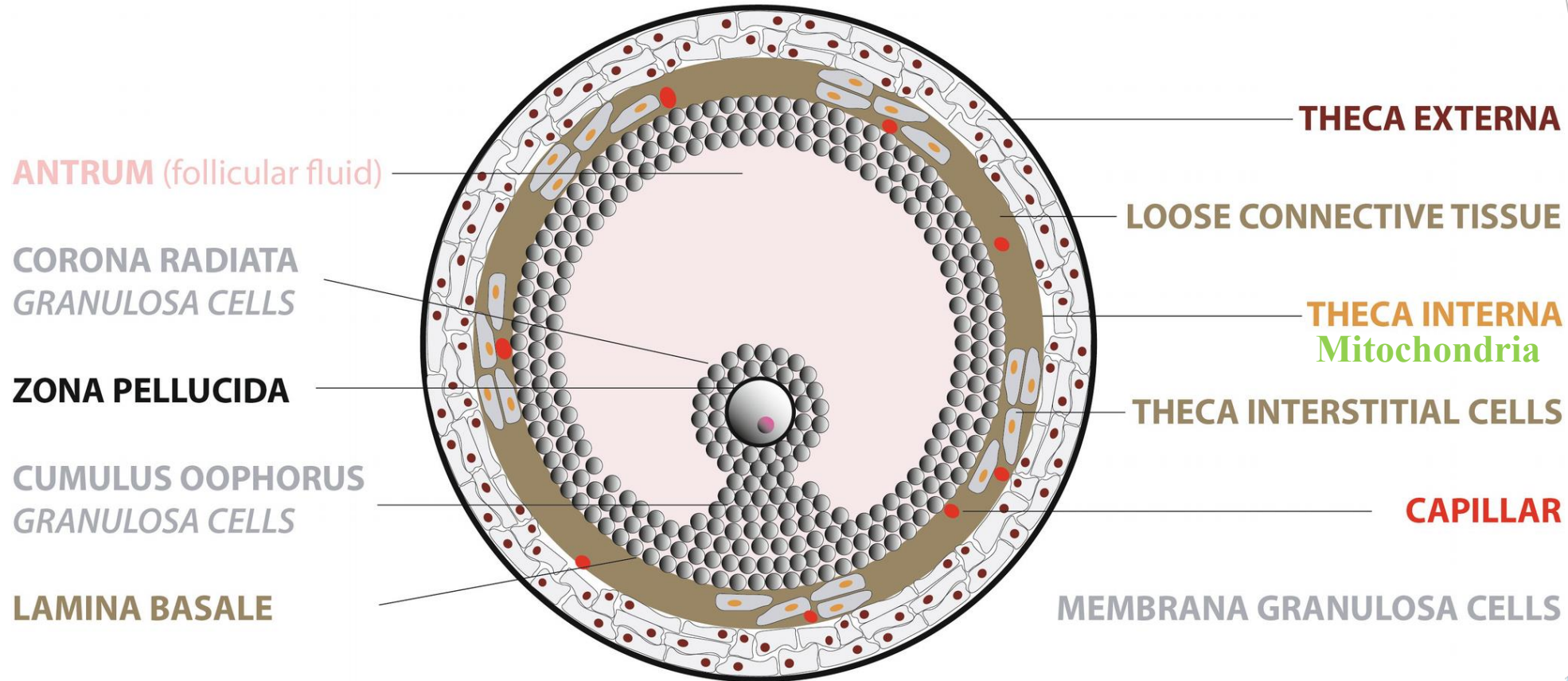
26

The menstrual cycle

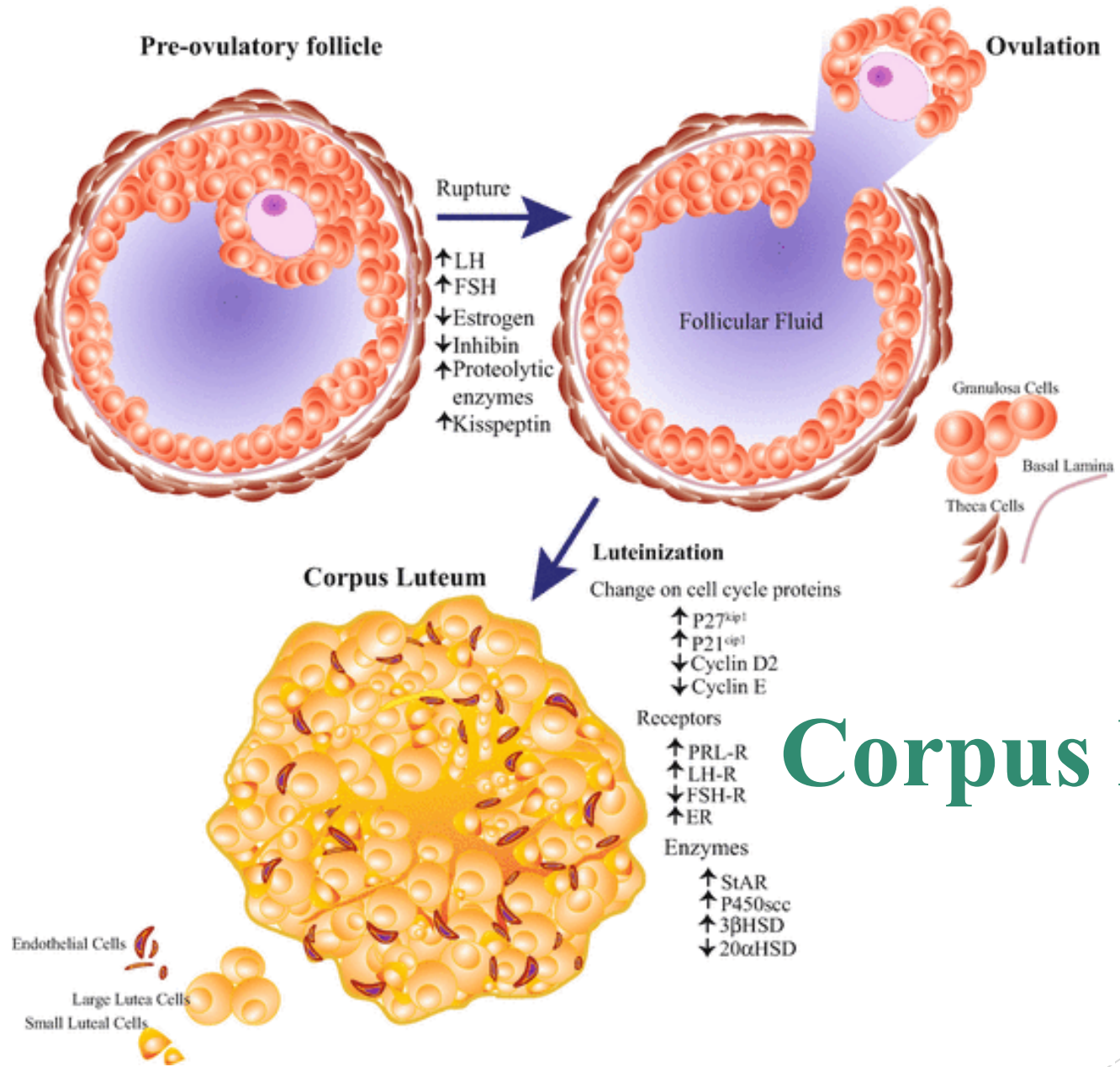




HISTOLOGIC ARCHITECTURE OF GRAAFIAN FOLLICLE



400 in the metaphase of meiosis 2
9 layers From Zona Pellucida



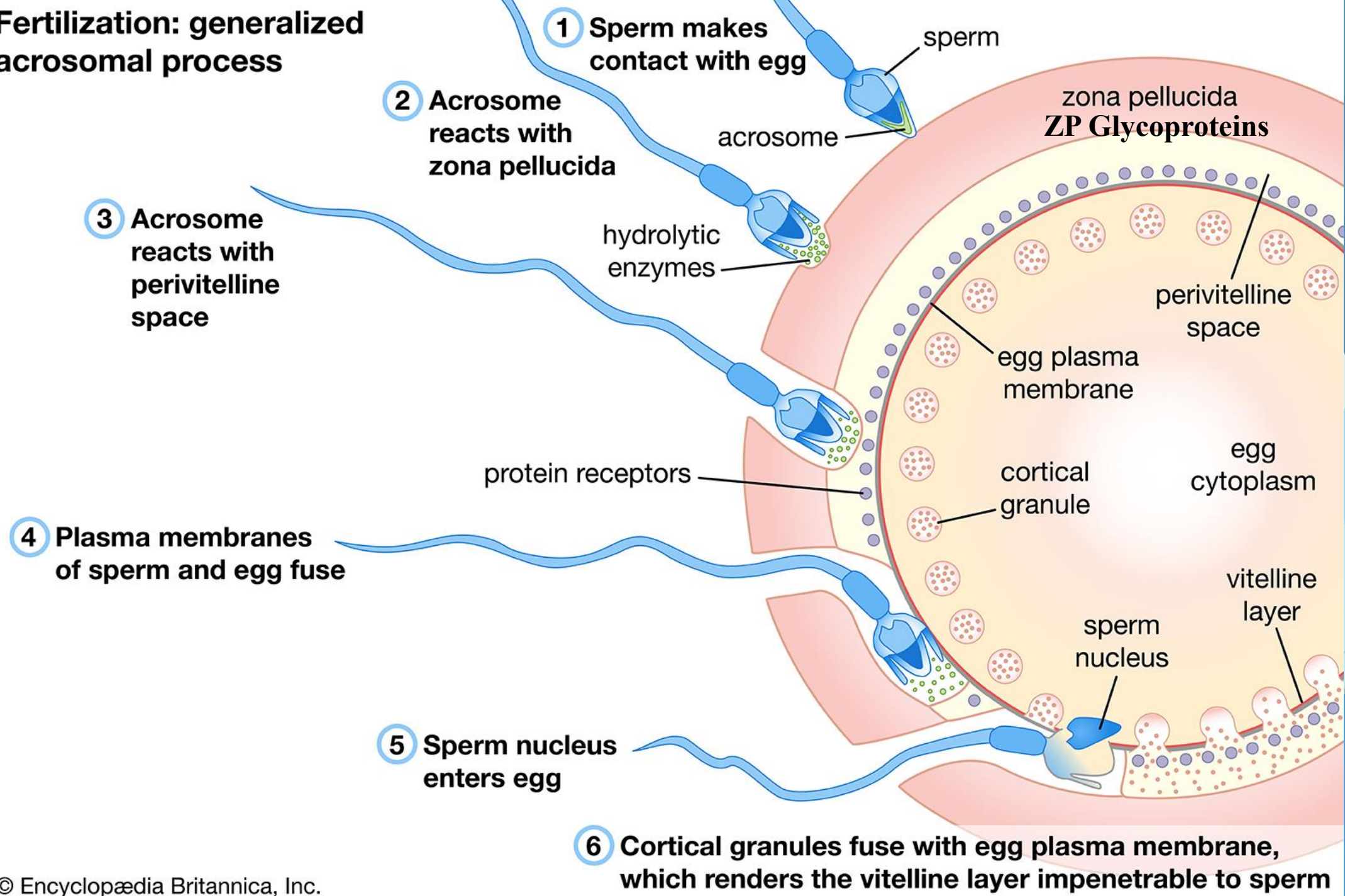
Corpus Luteum

انیمیشن

تخمک گذاری



Fertilization: generalized acrosomal process

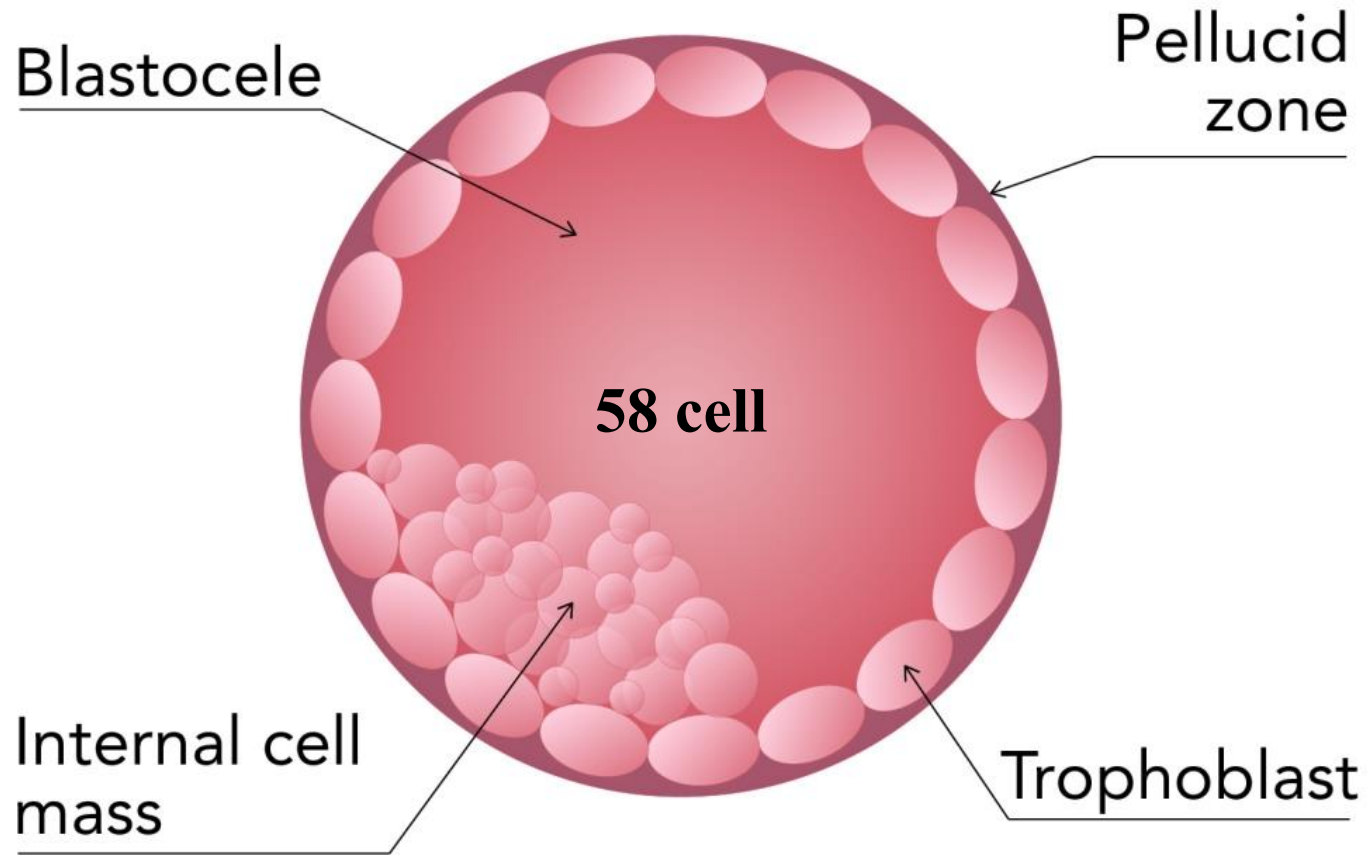


Fertilization

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MEDICAL MEDIA

Blastocyst



Ectopic pregnancy
Multiple births

Menstrual Cycle

IVF

IVF



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9 months in the mother's womb



Cesarean_Section

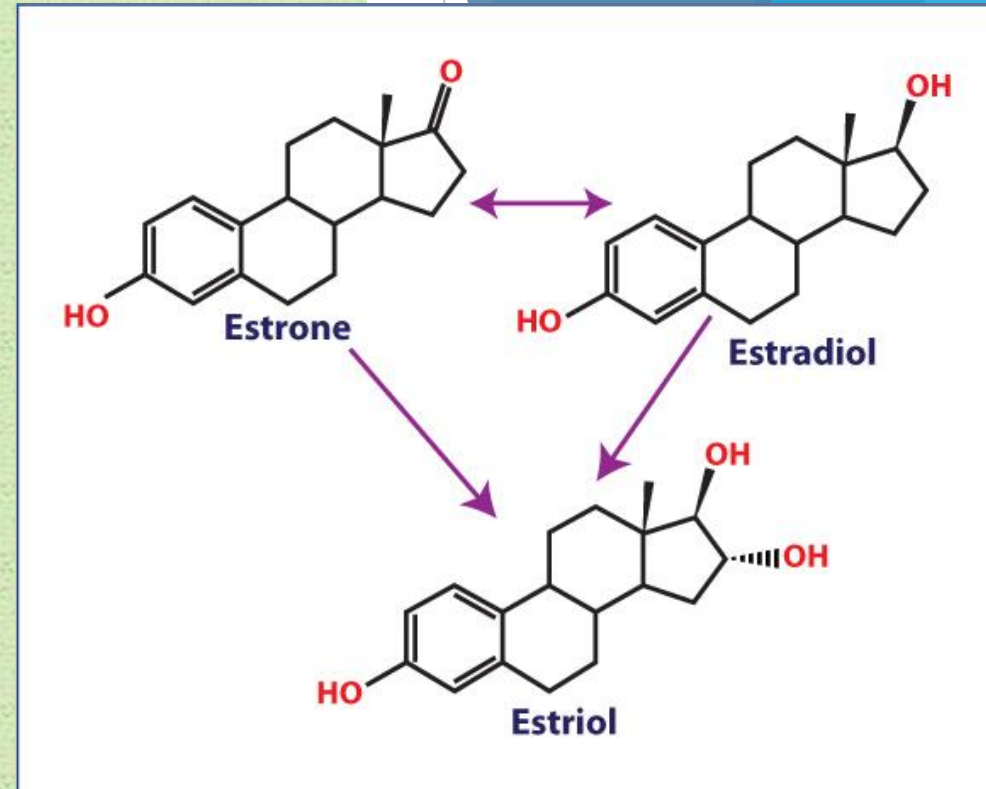
Effects Of Pregnancy On Thyroid Physiology

Hypermetabolic state

Physiologic Change	Thyroid-Related Consequences
↑ Serum thyroxine-binding globulin	↑ Total T ₄ and T ₃ ; ↑ T ₄ production
↑ Plasma volume	↑ T ₄ and T ₃ pool size; ↑ T ₄ production; ↑ cardiac output
D3 expression in placenta	↑ T ₄ production
First trimester ↑ in hCG	↑ Free T ₄ ; ↓ basal thyrotropin; ↑ T ₄ production
↑ Renal I ⁻ clearance	↑ Iodine requirements
↑ T ₄ production; fetal T ₄ synthesis during second and third trimesters	
↑ Oxygen consumption by fetoplacental unit, gravid uterus, and mother	↑ Basal metabolic rate; ↑ cardiac output

Types of estrogen

- The three major naturally occurring estrogens : **estradiol**, **estriol**, **estrone**
ovary **fetus** **Adrenal**
- From menarche to menopause : the primary estrogen is **17 β -estradiol**
- In postmenopausal women : more **estrone** is present than estradiol.
- Estradiol is produced from testosterone and estrone from androstenedione.
- Estrone is weaker than estradiol.





Age

Menstruation

Reproductive

Primary

Period

Contraceptive

woman

Cause

Problems

Menstrual

Physical

Medications

Lactation

Anorexia

Absence

Disturbances

Premature

Primary

Secondary

Menstrual

Period

Contraceptive

Pills

Breastfeeding

Physiological

No Menarche

Hormonal

Secondary

Menstruation

Pregnancy

Age

Reproductive

Menstrual

Hormonal

Secondary

Primary

Disturbances

Premature

Cause

Problems

Menstrual

Period

Contraceptive

Pills

Breastfeeding

Menstruation

Pregnancy

Age

Reproductive

Menstrual

Hormonal

Secondary

Primary

Disturbances

Premature

Cause

Problems

Menstrual

Period

Contraceptive

Pills

Breastfeeding

Menstruation

Pregnancy

Age

Reproductive

Menstrual

Hormonal

Secondary

Primary

Disturbances

Premature

Cause

Problems

Menstrual

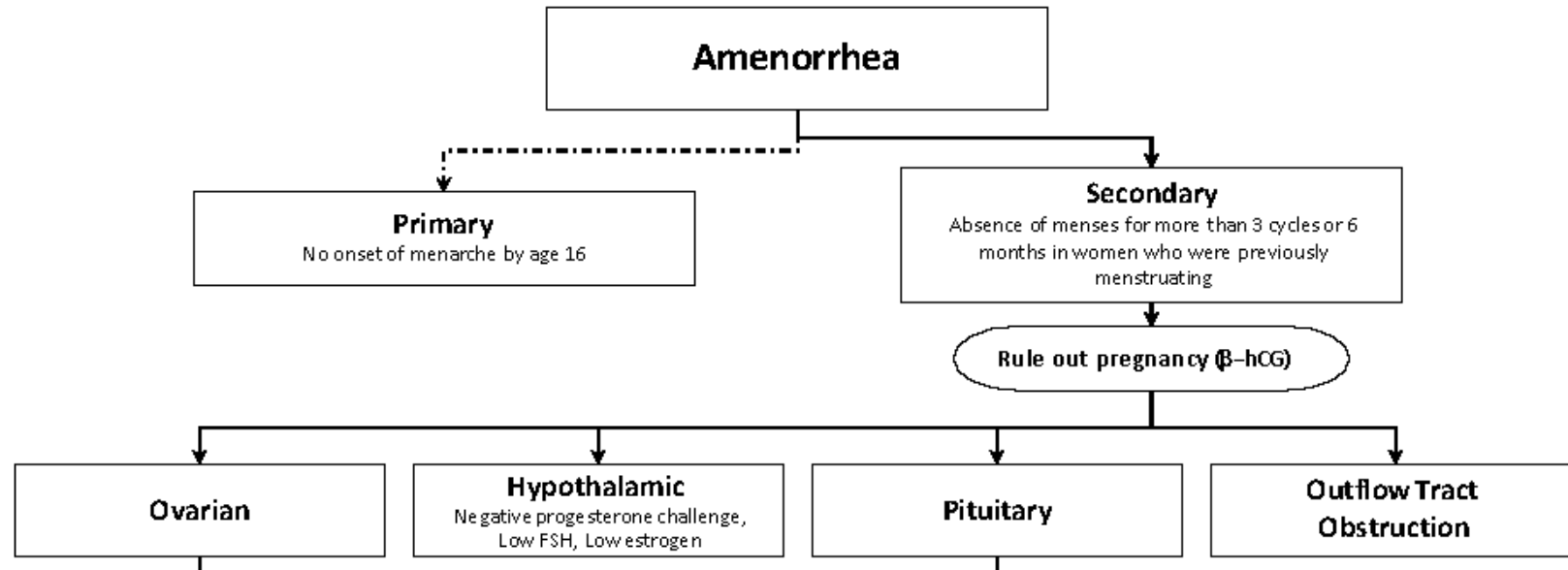
Period

Contraceptive

Pills

Breastfeeding

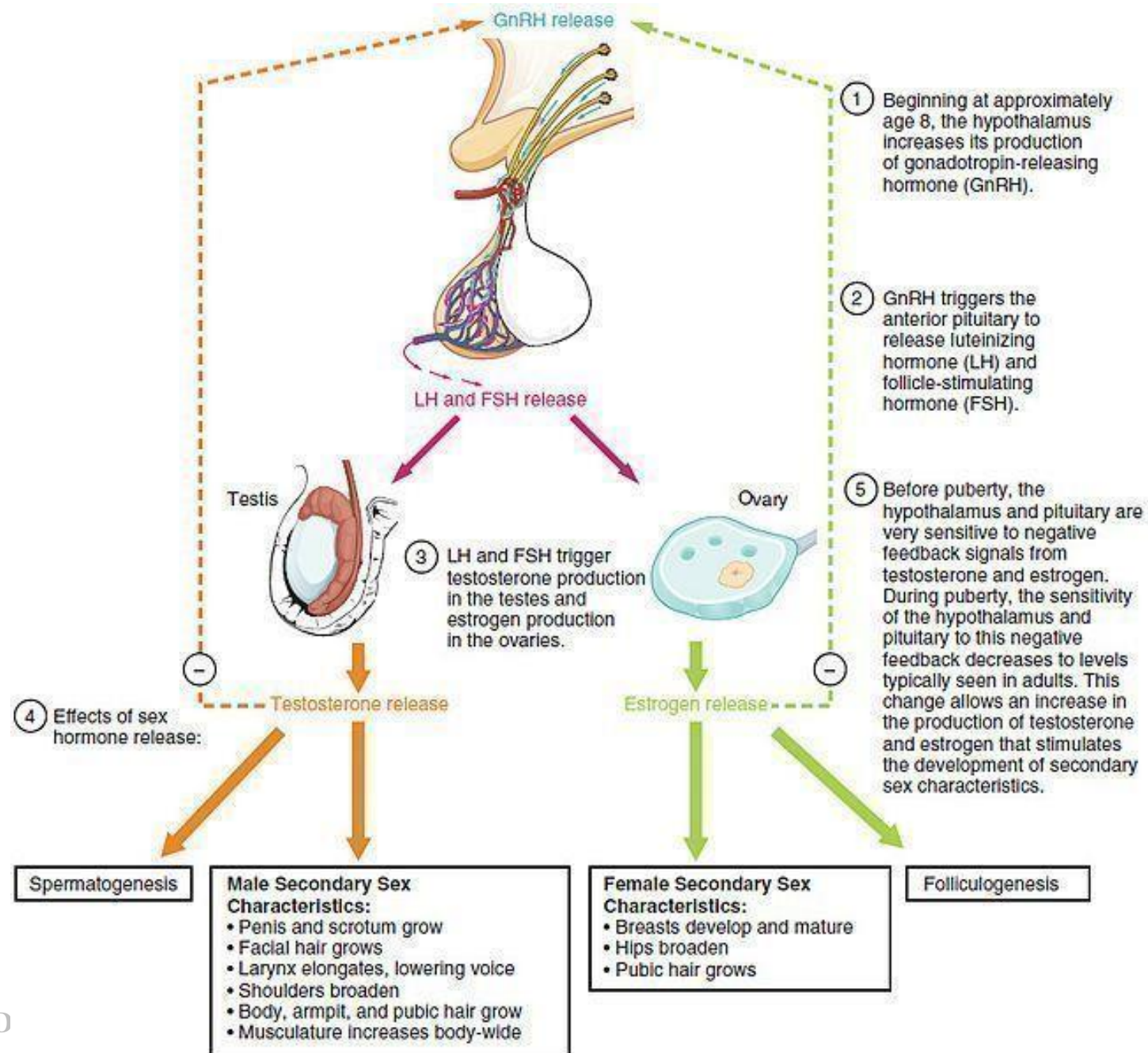
Amenorrhea



Cause of Primary Amenorrhea

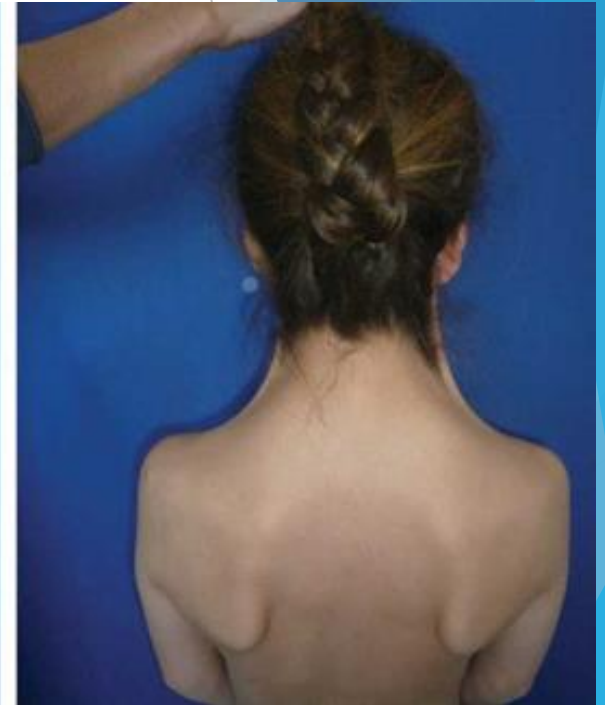
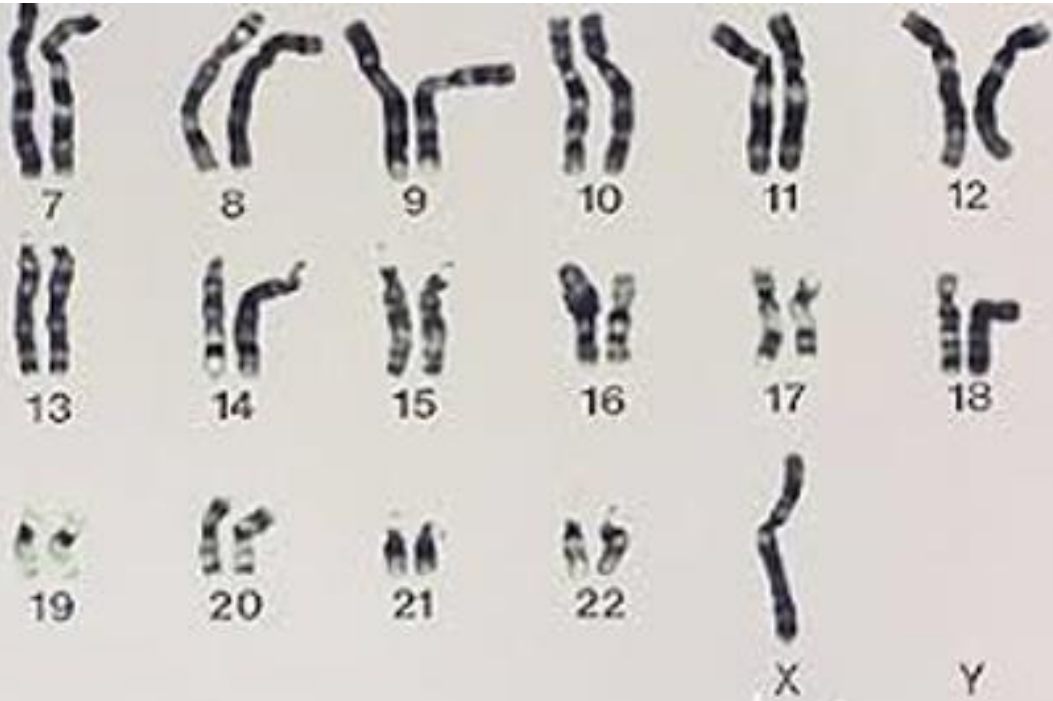
- **Hypergonadotropic Hypogonadism**
 - Genetic Disorders
 - Enzyme Deficiencies
 - Gonadotropin Receptor Mutation
- **Other causes of Primary Ovarian Failure**
- **Hypogonadotropic Hypogonadism**
- **Genetic Disorders**
- **Other Hypothalamic / Pituitary Dysfunctions**

Hyper Or hypogonadotropic hypogonadism

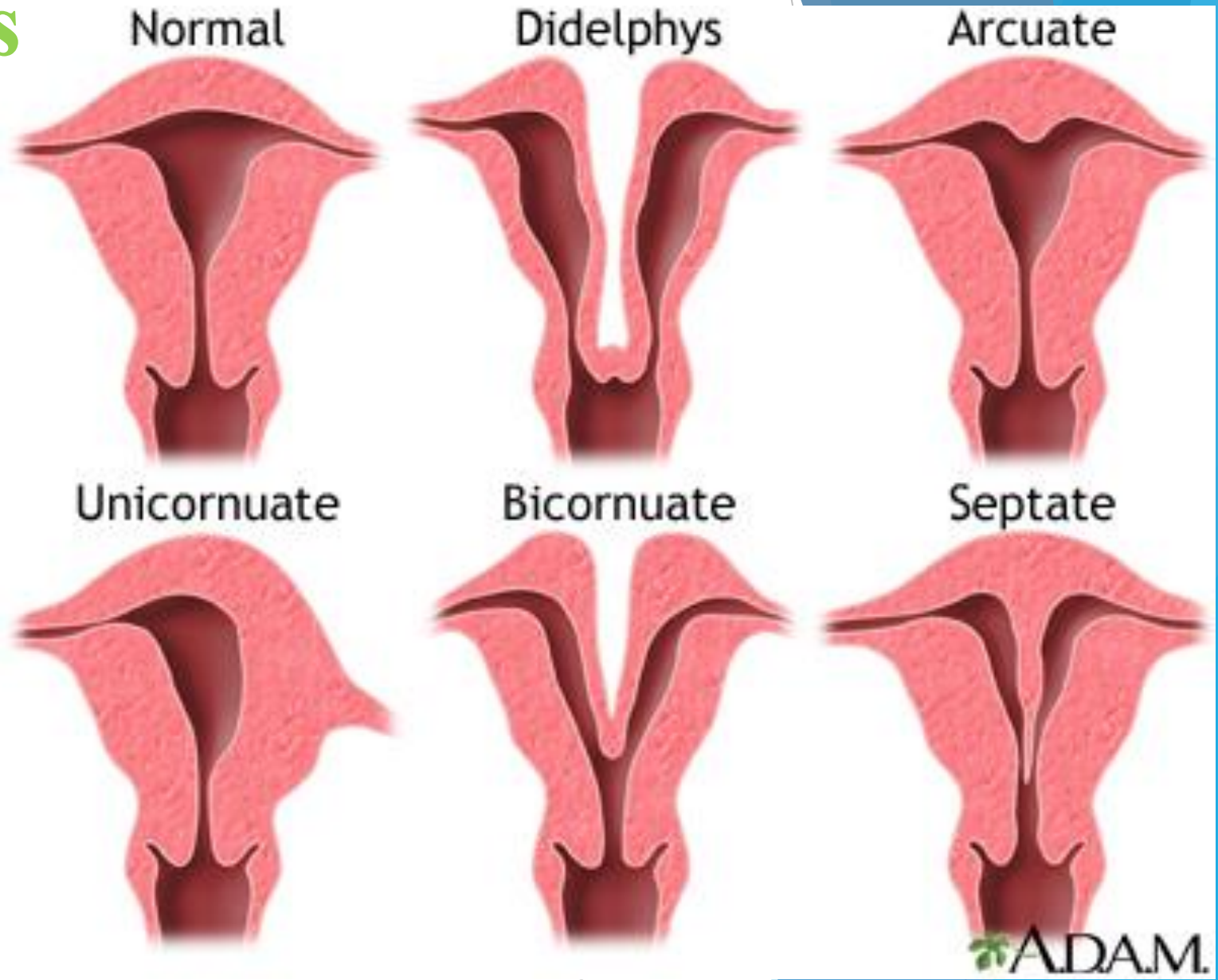
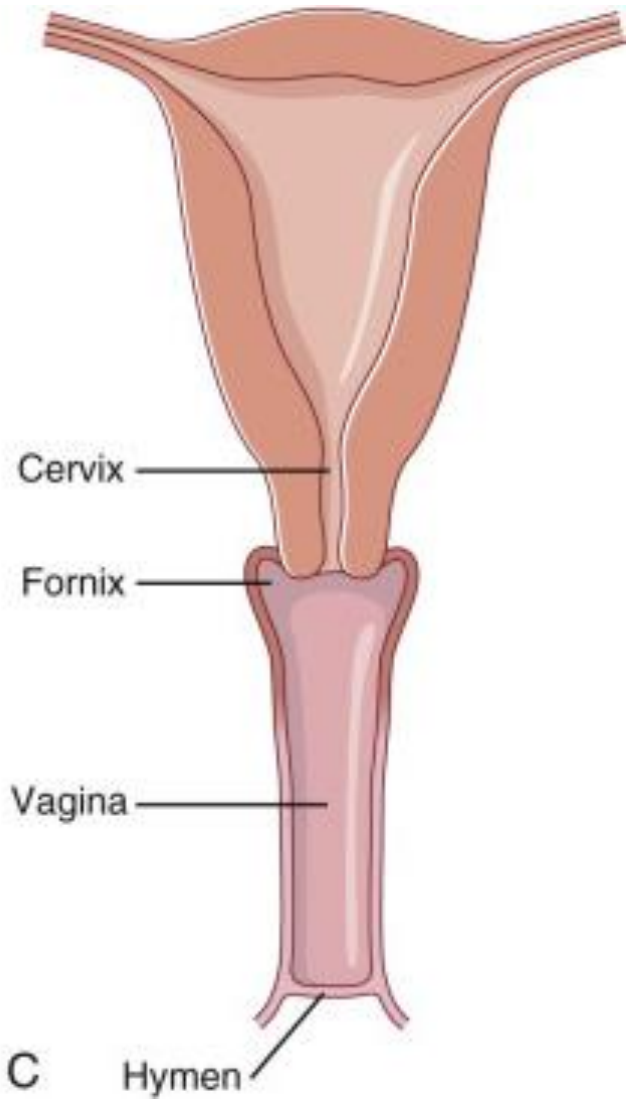


Turner's Syndrome (X-)

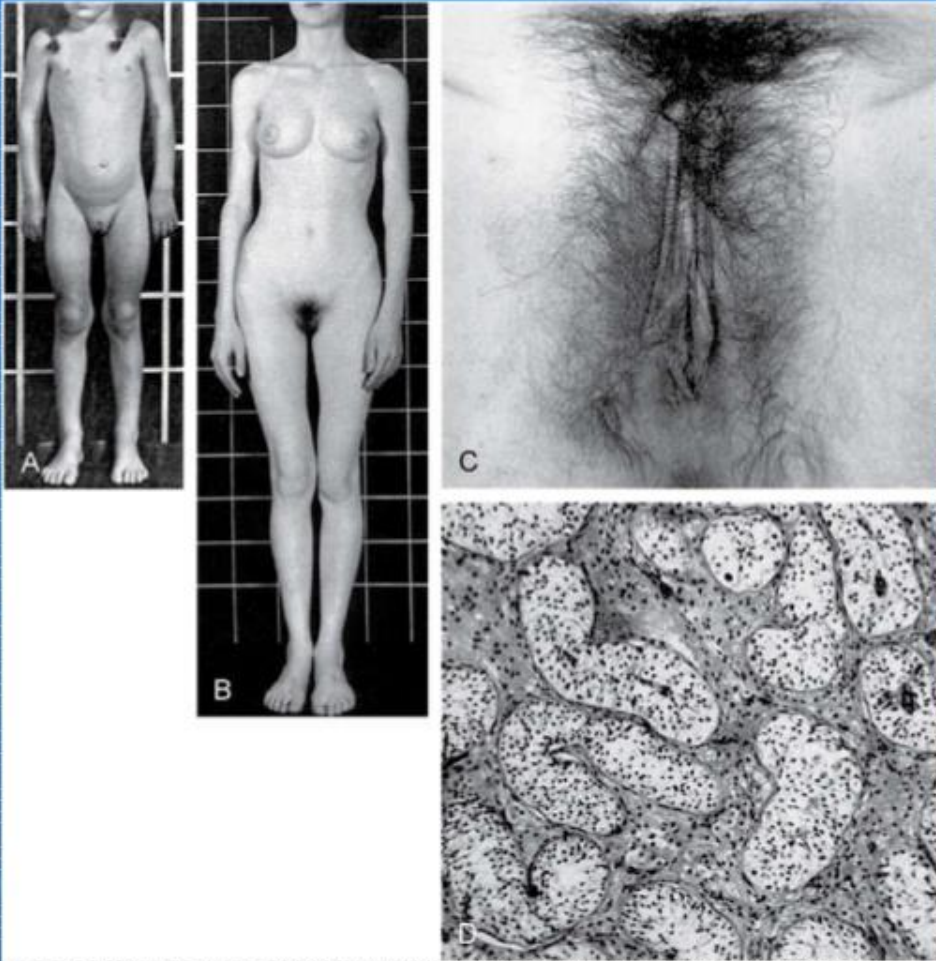
- Missing an X chromosome on 23rd Pair.



Mullerian Agenesis



Androgen Insensitivity Syndrome (Testicular Feminization Syndrome)



- Genetically male; looks female

Fig. 15-40. Patients with androgen insensitivity syndrome having 46,XY karyotypes and female external genitalia. A, Eleven-year-old patient. B, Seventeen-year-old patient. C, Photograph showing normal female external genitalia in patient in B. D, Photomicrograph of the cytoarchitecture of the testis removed from the inguinal canal of the patient in B showing Sertoli cell-lined seminiferous tubules. Germ cells are missing and the interstitial cells are hypoplastic.

Patient name : _____
Address : _____ Phone : _____
Height : _____ Weight : _____

Diagnosis

Amenorrhea



Evaluation of Primary Amenorrhea

History and physical examination completed for a patient with primary amenorrhea

Secondary sexual characteristics present

No

Measure FSH and LH levels

FSH and LH < 5 IU/ L

Hypogonadotropic hypogonadism

CNS; HP Disorder

FSH > 20 IU/ L and LH > 40 IU/ L

Hypergonadotropic hypogonadism

Karyotype analysis

Gonadal Failure

Yes

Perform ultrasonography of uterus

Uterus absent or abnormal

Karyotype analysis

46, XY

Androgen Sensitivity Syndrome

46, XX

Mullerian Agenesis

Uterus present or normal

Outflow obstruction

Yes

Imperforate hymen or transverse vaginal septum

No

Evaluate for secondary amenorrhea

Secondary Amenorrhea

MOST COMMON CAUSES OF **MISSED AND IRREGULAR PERIODS**



THYROID DISORDER



POLYCYSTIC OVARIAN SYNDROME (PCOS)



POOR DIET



HIGH STRESS LEVEL



EXCESSIVE DRINKING



OVER-EXERCISING

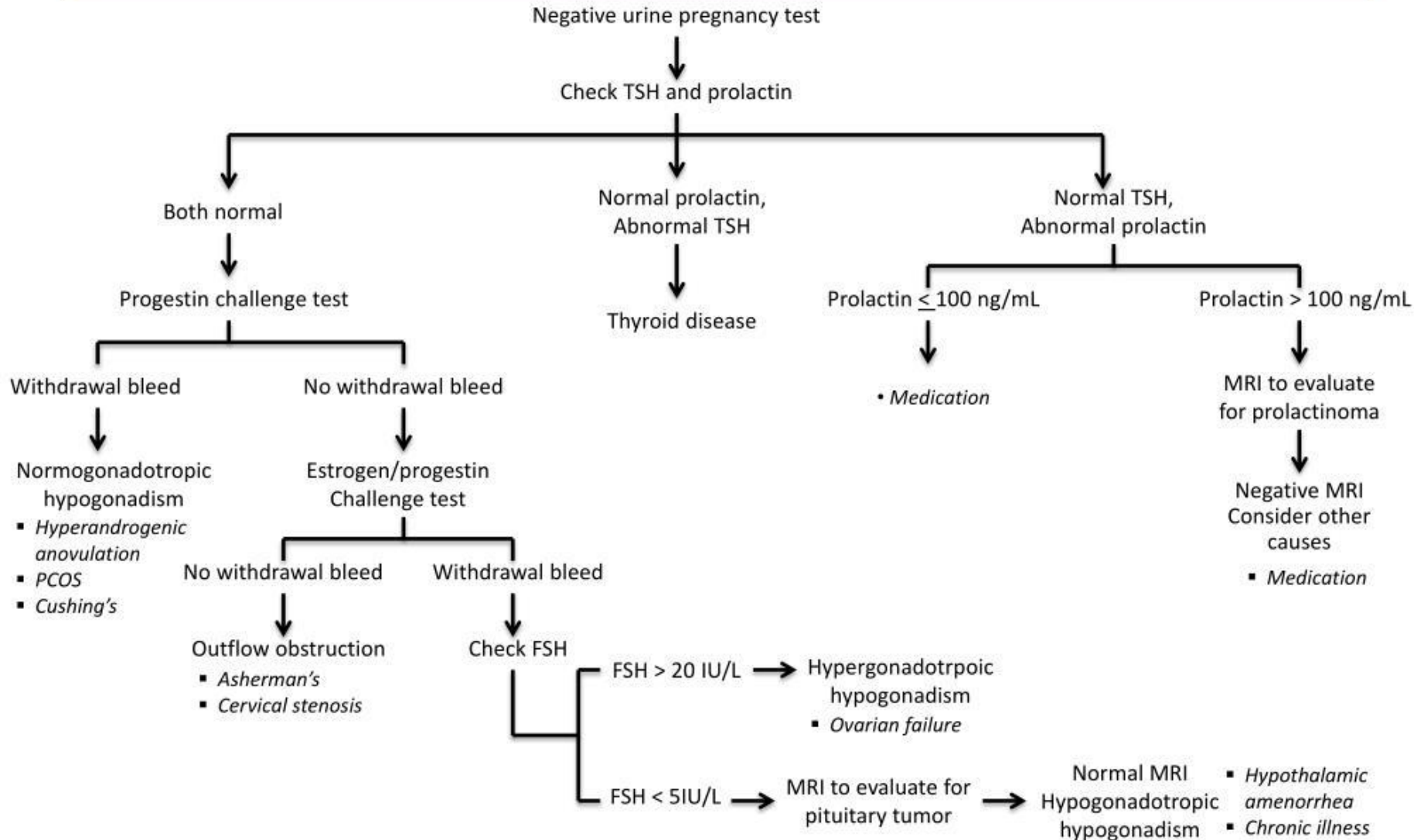


LOW BODY FAT

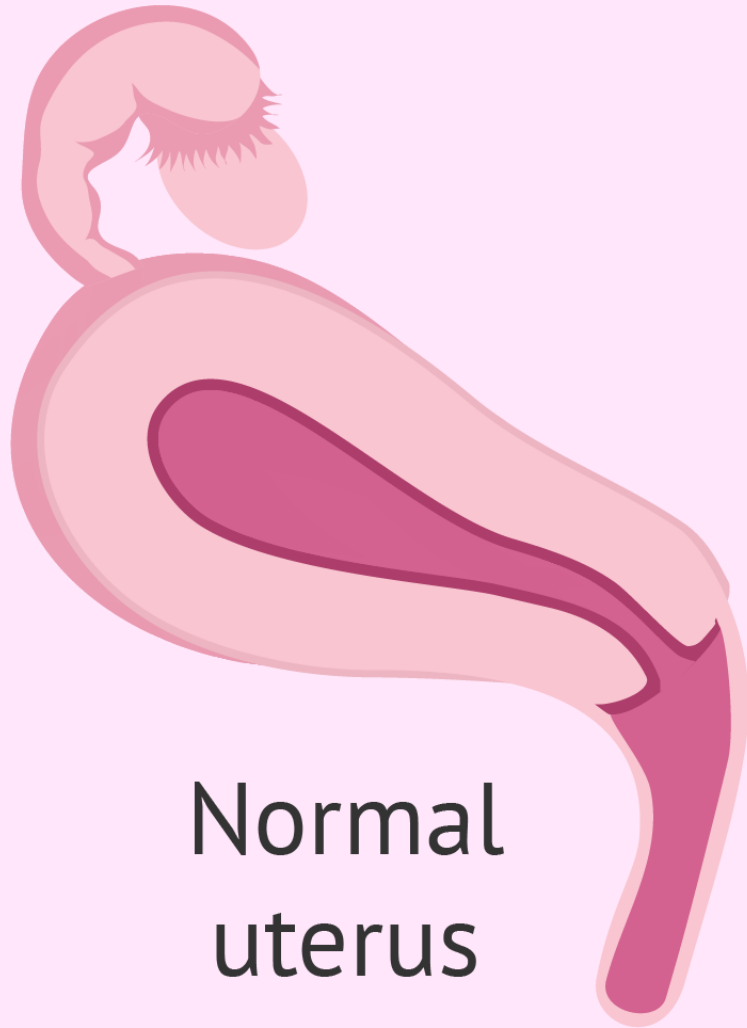


SMOKING

Secondary Amenorrhea/Oligomenorrhea: Evaluation



Asherman's Syndrome

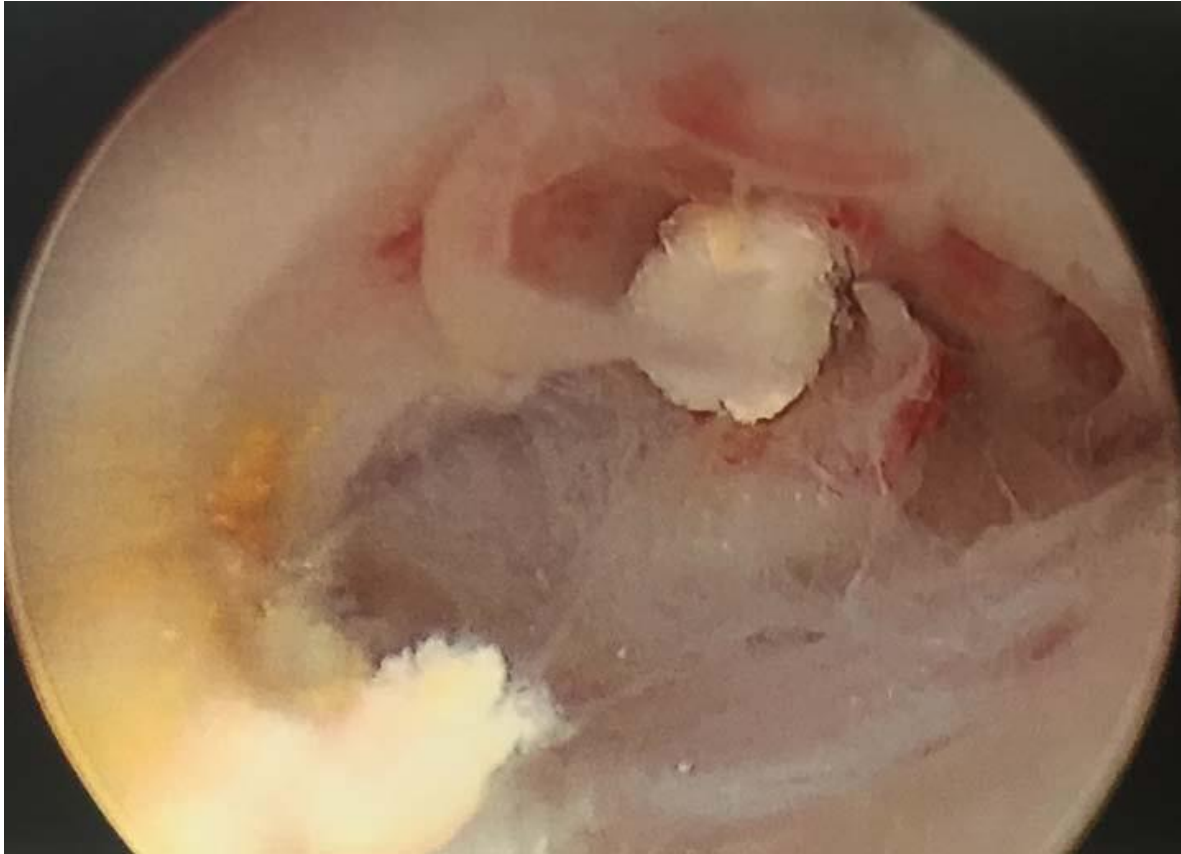


Normal
uterus



Asherman's
syndrome

Asherman's Syndrome



آشنایی با اصلاحات مهم:

Menarche

اولین

Menoraji

خون طولانی

Menometrorrhagia

نا منظم و لکه بینی

Polymenorrhea

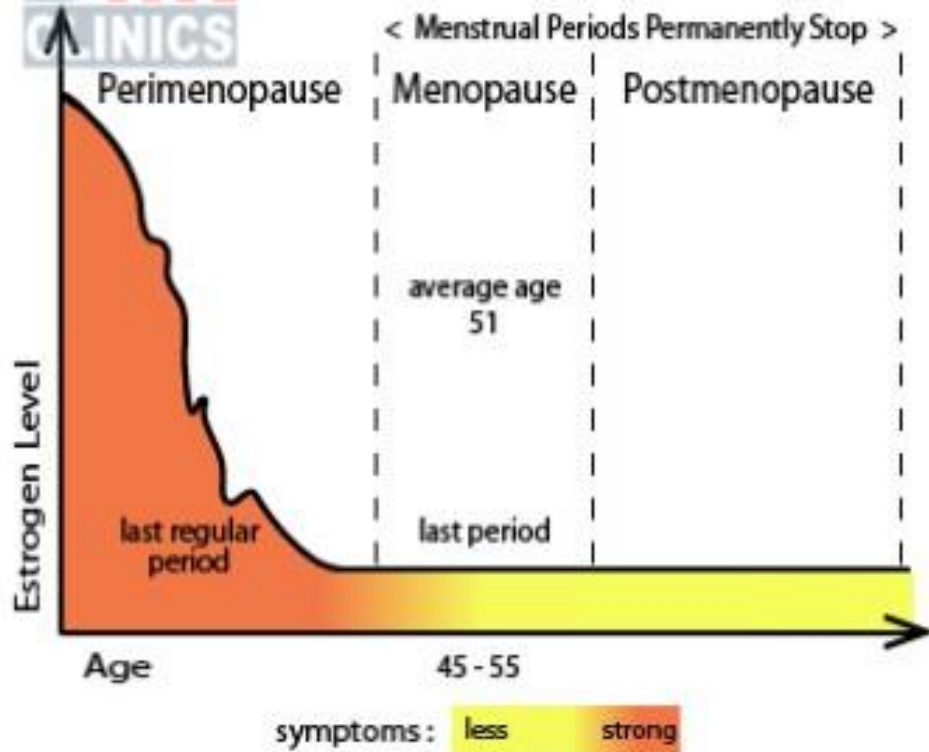
۱۵ روز

Oligomenorrhea

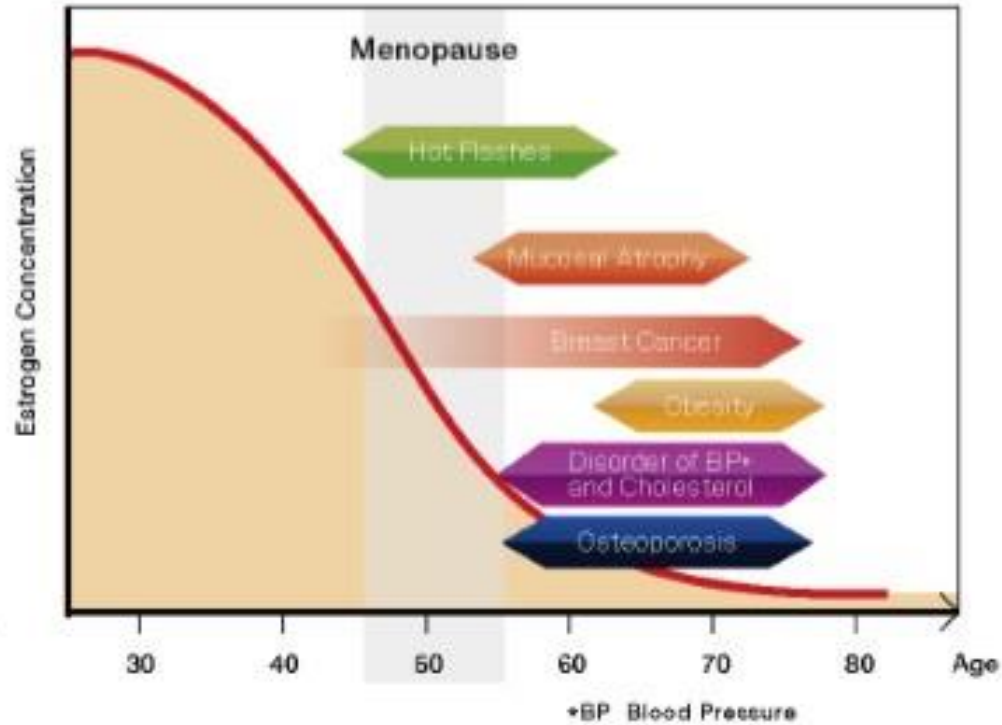
۵۰ روز

IRREGULAR
Weight Gain PERIODS STAGES
Perimenopause & symptoms
IRRITABILITY NAUSEA women FATIGUE Postmenopause
CRAMPS LOSS OF LIBIDO Menopause osteopenia
ESTROGEN
Age LEVEL MENOPAUSE NIGHT
MOOD SWINGS INSOMNIA IRREGULAR HOT NIGHT Postmenopause
CRAMPS anxiety WOMAN Weight Gain PERIODS SWEATS BREAST WOMEN OSTEOPOROSIS
MENSTRUATION NIGHT SWEATS FLASHES CANCER AGE
Nausea SWEATS URINARY INFECTIONS
VAGINAL DRYNESS Irritability of Libido DEPRESSION
URINARY HEART DISEASE
IRREGULAR PERIODS VAGINAL DISCOMFORT
HOT FLASHES

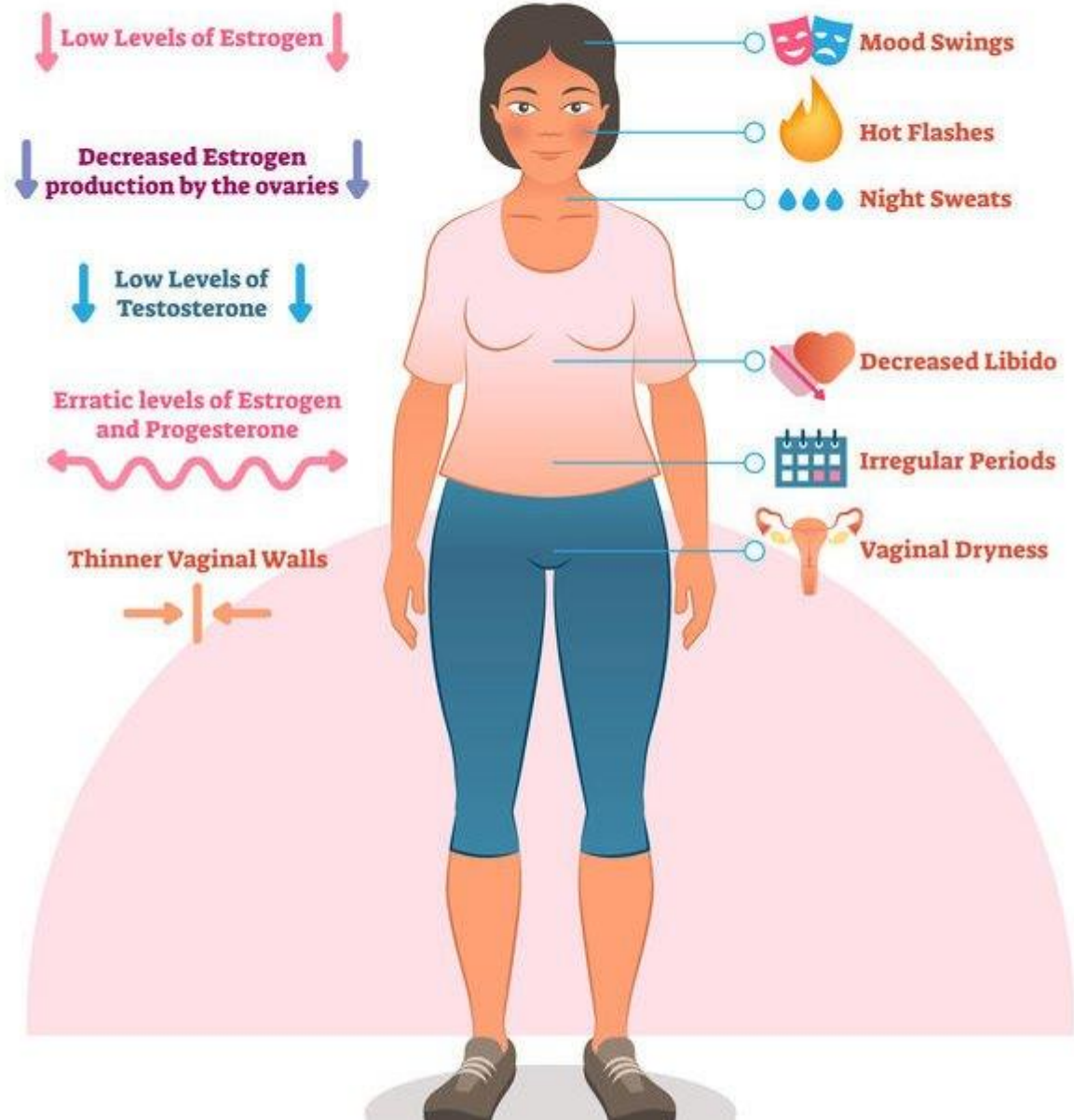
Phases of Menopause



Decreasing Serum Estrogen Concentration and Related Diseases



Menopause



PreTest®
Self-Assessment
and Review

12th
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HARRISON'S
**PRINCIPLES OF
INTERNAL
MEDICINE**

Richard M. Stone

LEHNINGER

PRINCIPLES OF BIOCHEMISTRY

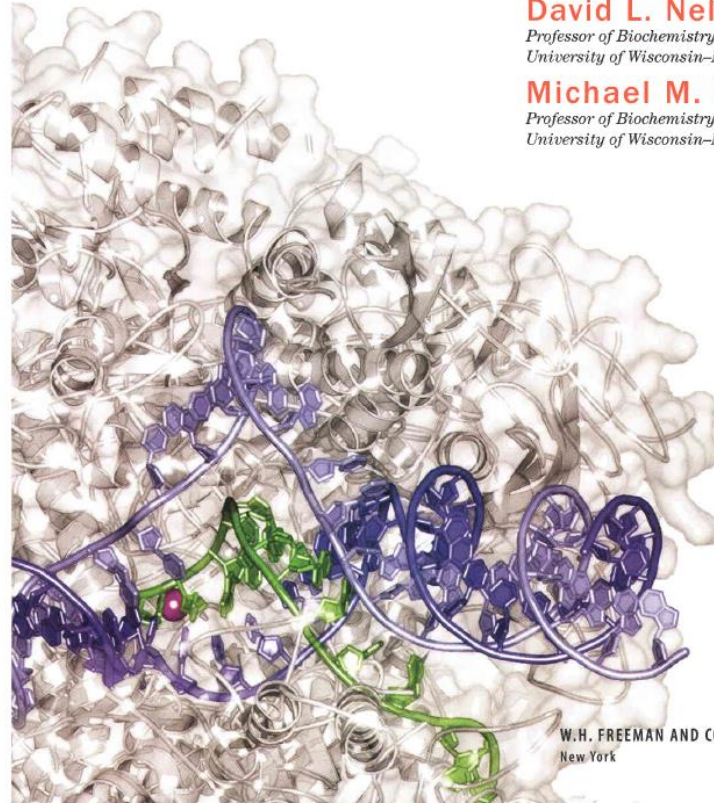
FIFTH EDITION

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Michael M. Cox

*Professor of Biochemistry
University of Wisconsin-Madison*



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**CLINICAL GUIDE TO
LABORATORY
TESTS**



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