

Androgens & Anabolic Steroids



Sources:

- Bertram G. Katzung Basic & Clinical Pharmacology 14th Edition
- Goodman and Gilman's The Pharmacological Basis of Therapeutics 13th edition. Laurence Brunton, Bjorn Knollmann, Randa Hilal-Dandan - (2017)

Motto And Vision



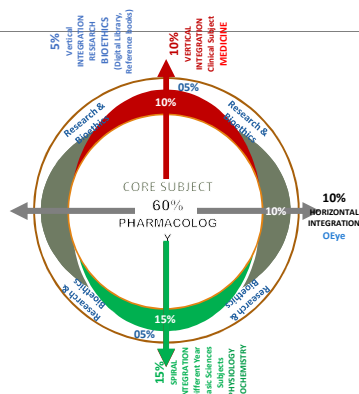
To impart evidence based research oriented medical education

To provide best possible patient care

To inculcate the values of mutual respect and ethical practice of medicine



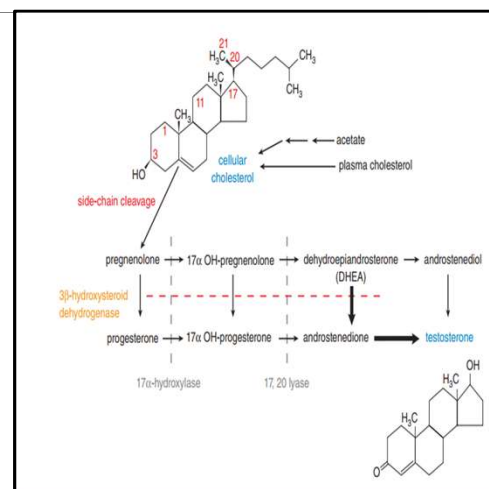
Prof. Umar's Clinically Oriented Integration Model
For Basic Sciences Interactive Lectures



4 th Year Pharmacology LGIS	
Core Subject – 60%	
Pharmacology	
Horizontal Integration – 10%	
Same Year Subjects	<ul style="list-style-type: none"> • Eye • Pathology
Vertical Integration – 10%	
Clinical Subjects	<ul style="list-style-type: none"> • Medicine • Surgery
Spiral Integration – 15%	
Different Year Basic Sciences Subjects	<ul style="list-style-type: none"> • Physiology (10%) • Biochemistry (5%)
Research & Bioethics, Digital library – 05%	

Androgens & Anabolic Steroids

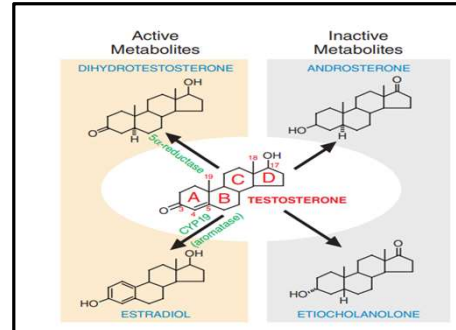
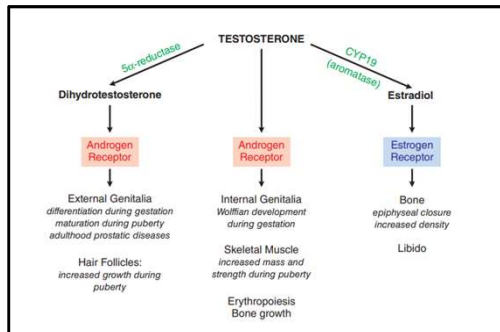
- Testosterone
- Dihydrotestosterone
- Androstenedione & Dehydroepiandrosterone
- LH
- FSH
- GnRH
- Activin
- Inhibin



Physiology, Spiral

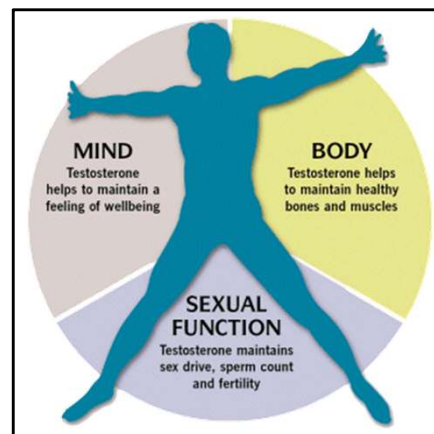
Androgens & Anabolic Steroids

Physiological Effects & Metabolism



Physiology. Spiral

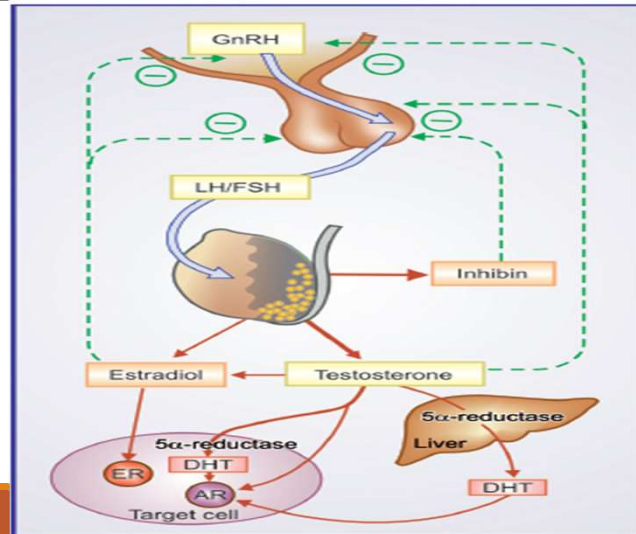
Androgens & Anabolic Steroids



Physiology. Spiral

Androgens & Anabolic Steroids

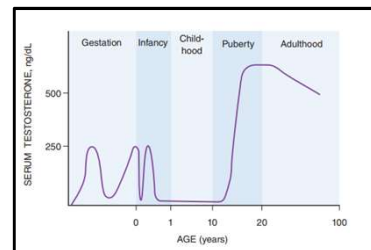
Feed back
Regulation of
production of
Testosterone



Androgens & Anabolic Steroids

Effects of Androgens at Different Stages
of Life

- In Utero
- Infancy
- Puberty
- Adulthood
- Senescence



Androgens & Anabolic Steroids

Consequences of Androgen Deficiency

- During foetal development
- Before completion of Puberty
- After Completion of Puberty
- In women

Pathology Horizontal

Androgens & Anabolic Steroids

Therapeutic Androgen Preparations

- Testosterone Esters
- Alkylated androgens
- Transdermal delivery systems
- Selective Androgen receptors Modulators

Testosterone

Testosterone Esters

Testosterone enanthate/undecanoate/cypionate

17 α -Alkylated Androgens

Methyltestosterone, oxandrolone, stanozolol

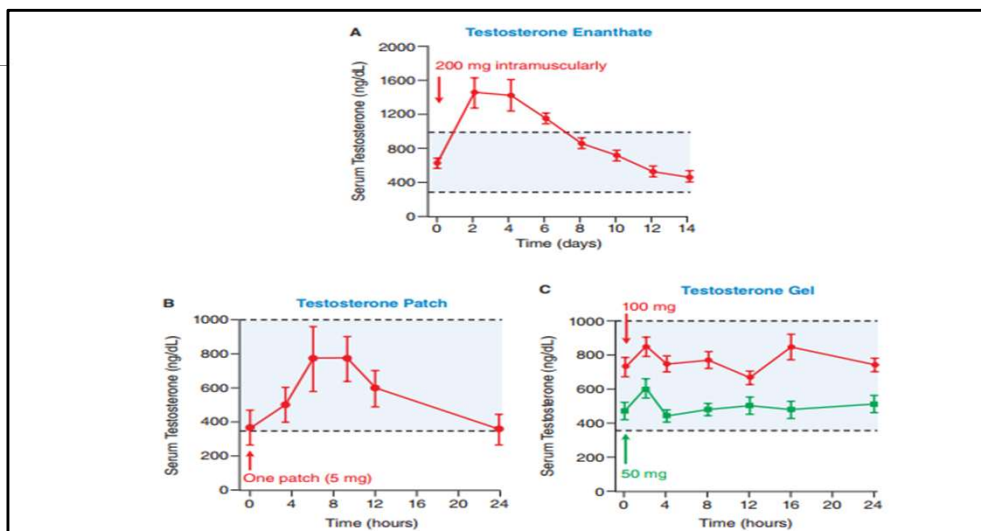
Fluoxymesterone, danazol

Other

7 α -Methyl-19-nortestosterone, tetrahydrogestrinone

Pharmacology..Core

Androgens & Anabolic Steroids



Pharmacology, Core

Androgens & Anabolic Steroids

Therapeutic Uses of Androgens

- Male Hypogonadism
- Monitoring
 - For Efficacy
 - For Deleterious effects
 - For Anticipating time of Puberty

Therapeutic Uses of Androgens

- Male Senescence
- Female Hypogonadism
- Catabolic and wasting states
- Angioedema
- Blood Dyscrasias

Pharmacology, Core

Androgens & Anabolic Steroids

Therapeutic Uses of Androgens

- Enhancement of athlete performance
 - Kind of androgen used
 - Efficacy
 - Side effects
 - Detection

Drug	Androgenic:Anabolic Activity
Testosterone	1:1
Testosterone cypionate	1:1
Testosterone enanthate	1:1
Methyltestosterone	1:1
Fluoxymesterone	1:2
Oxymetholone	1:3
Oxandrolone	1:3-1:13
Nandrolone decanoate	1:2.5-1:4

Pharmacology Core

EOLA

A 30-year-old male bodybuilder presented with complaints of **increased anxiousness**, **excessive anger**, **dyspnea** on minimal exertion and **tachycardia**. Investigations showed marked polycythemia, elevated testosterone level and suppressed luteinizing and follicle-stimulating hormones. ECG showed atrial fibrillation, Echocardiography showed a dilated cardiomyopathy with left ventricular ejection fraction (LVEF) of 20%. He has a history of excess anabolic steroid use for past 3 years.

Research, Bioethics, Artificial Intelligence, Family Medicine

Goldman, A. and Kathrins, M., 2022. Optimized use of the electronic health record and other clinical resources to enhance the management of hypogonadal men. *Endocrinology and Metabolism Clinics*, 51(1), pp.217-228.

Underwood, M., van de Ven, K. and Dunn, M., 2021. Testing the boundaries: Self-medicated testosterone replacement and why it is practised. *International Journal of Drug Policy*, 95, p.103087.

Albano, G.D., Amico, F., Cocimano, G., Liberto, A., Maglietta, F., Esposito, M., Rosi, G.L., Di Nunno, N., Salerno, M. and Montana, A., 2021, January. Adverse effects of anabolic-androgenic steroids: A literature review. In *Healthcare* (Vol. 9, No. 1, p. 97). MDPI.

Singh, V. and Batta, A., 2020. Suspected reactivation of extrapulmonary tuberculosis focus after non-medical abuse of anabolic androgenic steroids: a case report. *Journal of basic and clinical physiology and pharmacology*, 31(1).