







#4 Physiology of androgens and control of male sexual functions

Objectives:

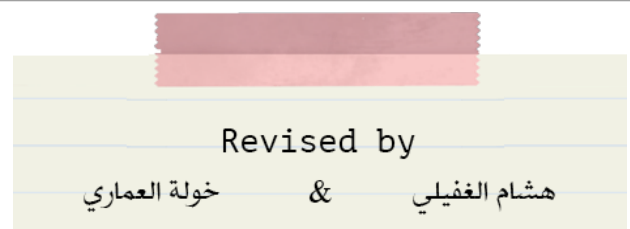
- Understand the functions of the male reproductive organs and glands
- Describe the synthesis, secretion, metabolism and effects of testosterone
- Explain how the hypothalamus and anterior pituitary gland regulate male reproductive function
- Describe the major testicular abnormalities
- Discuss the normal mechanism of the male sexual act

You are recommended to study the anatomy of male genital system first

-
-  Important
 -  Males notes
 -  Females notes
 -  Extra

Resources: 435 female's & male's slides

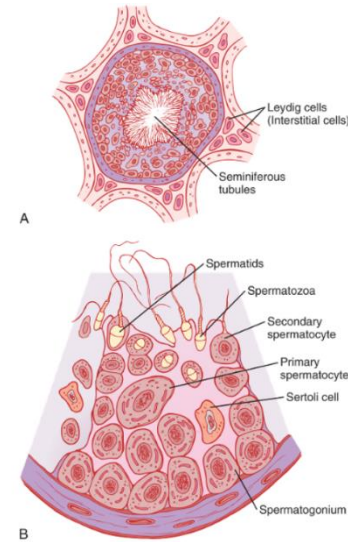
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Spermatogenesis

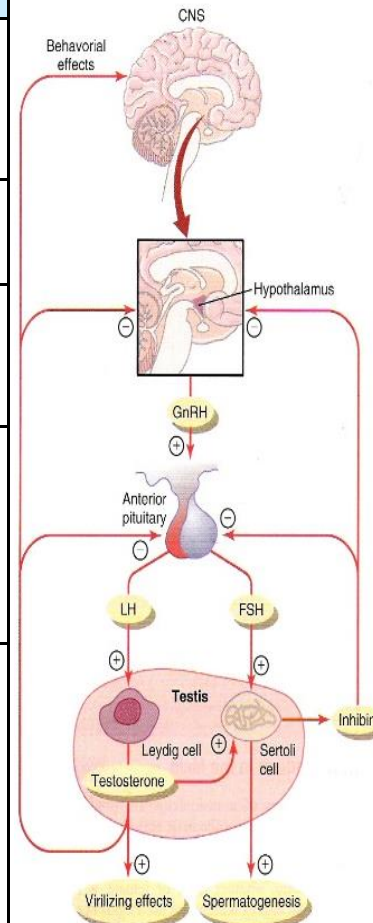
Definitions:

Spermatogenesis	<ul style="list-style-type: none"> It's the formation of sperms from spermatogonia occurs in the seminiferous tubule during active sexual life (due to stimulation by Anterior pituitary Gonadotropin hormones). Begins at age 13, continues throughout life and decrease in old age. <i>There no menopause for male. Spermatogonia are cells dividing all the time.</i>
Sertoli cells	<ul style="list-style-type: none"> large cells with overflowing cytoplasmic envelope surround the developing spermatogonia around central lumen of the seminiferous tubules.
Leydig cells	<ul style="list-style-type: none"> Lie within the interstitium between the seminiferous tubules. Numerous in the newborn male in the first few months & then disappear until puberty when it appears again and become active They don't exist in the testis during childhood (when the testis secretes almost no testosterone) Active at puberty and throughout adult life and secrete testosterone.



Hormonal factors that stimulate spermatogenesis:

HORMONE	SECRETED BY	FUNCTION
Testosterone	Leydig cells, (located in the interstitium of the testis)	Essential for the growth and division of the testicular germinal cells.
LH	Anterior pituitary	Stimulates the leydig cells to secrete testosterone.
FSH	Anterior pituitary	Stimulates the sertoli cells, stimulate the conversion of spermatids to sperm (also important for spermatogenesis).
Estrogen	Formed from testosterone* by the sertoli cell under FSH stimulation	Essential for spermatogenesis. *Adipocytes can release enzyme aromatase that convert testosterone to estrogen The estrogen has a receptors in the primary spermatocytes and secondary spermatocytes.
Growth hormone	Anterior pituitary	<ul style="list-style-type: none"> (And also other body hormones) is necessary for controlling metabolic functions of the testis. Gh promotes early division of spermatogonias in its absence (pituitary dwarfs), the spermatogenesis is severely deficient or absent infertility.



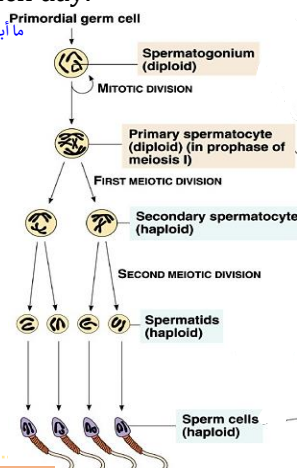
Developmental Events of sperm (sperm journey):

Location:	Seminiferous Tubule				Epididymis	Epididymis & vas deferens	Female Reproductive Tract (After ejaculation)
Cell Type:	Spermatogonia	Primary Spermatocytes	Secondary Spermatocytes	Spermatids	Sperm	Sperm	(After ejaculation) Sperm
Cellular Event:	1 Formation				2 maturation	3 Storage	4 Capacitation
	Mitosis	Meiosis I	Meiosis II	Differentiation	• Sperm acquires motility		• Hyperactivation • Acrosome reaction

1 Formation

- The 2 testis of adult human formed up to 120 million sperm each day.

- ما أبكم تهتمون للسبيرماتوجينيسيس، ماتهمنا يتأخذونها بالميريو
- Spermatogonia become progressively modified and enlarged to form large primary spermatocytes. Each of these, in turn, undergoes meiotic division to form two secondary spermatocytes.
- After another few days, these too divide to form spermatids that are eventually modified to become sperm (spermatozoa).
- The entire period of spermatogenesis, from spermatogonia to sperm, takes about **74 days**



2 maturation

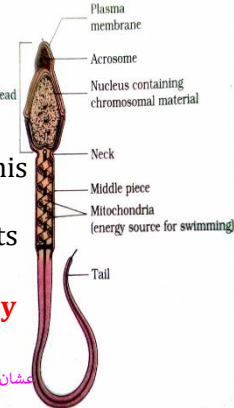
Maturation of sperm in the epididymis steps :

- 1- sperms formation occurs in the seminiferous tubule
- 2- then sperms require several days to pass through the epididymis (not motile yet)
- 3- After the sperm have been in the epididymis for 18 to 24 hour, they develop the capability of **motility**. (Some **inhibitory proteins in the epididymal fluid prevent final motility until after ejaculation**)

موضوع الحركة بسيط لو بقى الحيوان المنوي لأكثر من يوم في البربخ راح يصير قادر على الحركة وماتبور لكنه مادام في جسم الذكر ما راح يتحرك إلا لو تم قذفه ويبدأ يتحرك في الرحم أو الجهاز التناسلي الإناثي عموماً.

Physiology of mature sperms :

- After ejaculation, Mature sperm are **motile &** capable of fertilizing the ovum.
- The sertoli cells and epithelium of the epididymis secrete nutrient fluid which contains (testosterone & estrogens), enzymes & nutrients essential for sperm maturation.
- Their activity is enhanced in a neutral & **slightly alkaline** medium & depressed in mildly acidic medium. *عشان كذا الستات زمان قبل ما يطع الاورال كوتراسبتف كانوا يشطفوا الفجاينا بالخل.*
- The life expectancy of ejaculated sperm in the female genital tract is only **1 to 2 days**.



3 Storage

- Small amount of stored in the epididymis but The **majority** stored in the vas deferens, maintaining their fertility for at least **a month**.
- The sperm are kept inactive state by multiple inhibitory substances in the secretion of the ducts. They will stored up to month if the person is not sexually active the sperms undergo lysis

Capacitation of The Sperm

(making the sperm possible to penetrate the ovum)

What is the capacitation ?

without capacitation the sperm won't be able to penetrate the ovum thus fertilization won't occur.

Sperm in the epididymis is kept inactive by multiple inhibitory factors secreted by the genital duct epithelia, and they get activated in the female genital tract, for the processes of fertilization. **These activation changes are called capacitation of the spermatozoa** (requires 1 to 10 hrs).

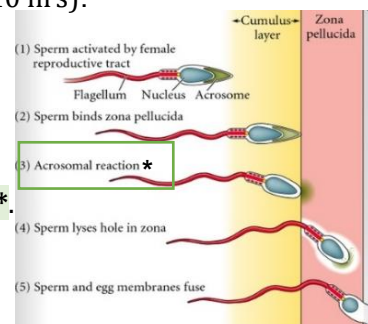
Some changes that are believed to occur are the following:

1. **Uterine and fallopian fluids wash away the inhibitory factors** which suppress the sperm activity in the male genital ducts.
2. Cellular membrane covering the acrosome is covered with cholesterol which prevent the release of its enzyme. After ejaculation the sperm is removed from the cholesterol vesicles and this makes the membrane of the sperm head become weaker*.
3. The sperm membrane becomes more permeable to Ca^{2+} ion which increase their movements and help to release the proteolytic enzymes from acrosome which aid in penetrating the ovum*.

* Acrosome enzymes, "Acrosome Reaction" and penetration of the ovum:

The acrosome of the sperm stores large quantities of **hyaluronidase and proteolytic enzymes**. **Hyaluronidase** depolymerizes hyaluronic acid polymers in the intracellular cement that holds the ovarian granulosa cells together. Also the **proteolytic enzymes** digest the proteins.

The ovum after ovulation has an outer layer called zona pellucida the proteolytic enzymes that found in the acrosome help in penetrating the layers surrounding the ovum and the fertilization occurs



Glands:

Seminal vesicles	Prostate gland
<p>Secrete mucoid material containing fructose, citric acid & nutrient substances & large quantities of prostaglandins* & fibrinogen (clotting factor)</p> <p>The semen after ejaculation become one plug " يتخثر " within few minutes, and after 10-15 minutes or more become more liquid and watery</p>	<p>Secrete thin milky (alkaline) fluid contains Ca²⁺ ion, citrate ion, phosphate ion, a clotting enzyme & profibrinolysin (lysis)</p>
<p>*prostaglandins help in fertilization in two ways:</p> <ol style="list-style-type: none"> 1) Reacting with the female cervical mucus making it more receptive to sperm movement 2) Causing backward reverse peristaltic contractions of the uterus & fallopian tubes to move the ejaculated sperm toward the ovaries <p>Backward Reverse Peristaltic Contractions: إنقباضات راجعة تقلل من المسافة التي يقطعها الحيوان ليصل إلى البويضة ، لهذا السبب لا ينصح بالsexual intercourse in late pregnancy, due to the presence of prostaglandins in the semen that cause these contraction.</p> <p>Prostaglandins are several types the one that is found in the semens cause contraction.</p>	<p>Functions of alkaline prostate fluid:</p> <ol style="list-style-type: none"> 1) Important for Successful fertilization of the ovum. 2) The alkaline fluid help to neutralize the slightly acidic fluid of the vas deferens (due to the presence of citric acid and metabolic product of the sperm that inhibit sperm fertility) and other seminal fluids during ejaculation 3) Enhances motility & fertility of sperm ,by neutralizing the acidic vaginal secretions¹.

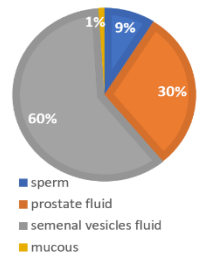
Semen²:

- It's average pH is about 7.5.
- **Ejaculated semen during sexual act is composed of:**
 - Fluid & sperm from the vas deferens (~10%).
 - Fluid from the prostate gland (~30%)*.
 - Fluid from the seminal vesicles (~60%)**.
 - Small amounts from the mucous glands** and the bulbourethral (cowper) glands.

*The **alkaline prostatic fluid** helps to neutralize the mild acidity of other portions of the semen and gives the semen a milky appearance. The texture of the semen is due to the prostatic secretion.

The **seminal vesicles and mucous glands fluid give the semen mucoid consistency.

COMPOSITION OF THE SEMEN



Effect of sperm count, morphology and motility on fertility: Both the count and the the ability to function are important to avoid infertility مهم تعرفون هالنقطه

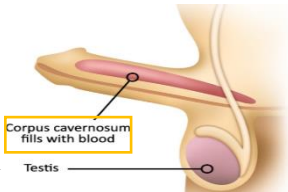
Sperms quantity	Abnormal shape	Abnormal motility
<ul style="list-style-type: none"> • The quantity of ejaculated semen during coitus about 3.5 ml, each ml contains about 120 million sperm (normal male count vary between 35 million to 200 million sperm). • Sperm count below 20 million leads to infertility. 	<p>Sometimes sperm count is normal but still infertile when about one half of the sperm have abnormal shape.</p> <p>Abnormal infertile sperm, compared with a normal sperm on the right</p>	<p>Sometimes the shape of the sperm is normal but they are either relatively non-motile or entirely non-motile which causes infertility.</p>

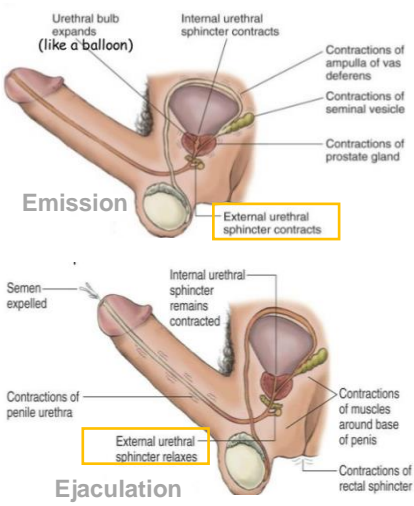
¹ the vaginal secretions of the female are acidic (pH of 3.5 to 4.0). Sperm do not become optimally motile until the pH of the surrounding fluids rises to about 6.0 to 6.5.

² the male reproductive fluid, containing spermatozoa in suspension. المنى

Male Sexual Act

Stages of male sexual act:

- 1. Penile erection:** Penile erection is the first effect of male sexual stimulation, and the degree of erection is proportional to the degree of stimulation, whether psychic or physical. Erection is the process of filling the erectile tissue of the penis with blood at a pressure level near that of the arterial pressure. The arteries leading to the erectile tissue dilate in response to parasympathetic impulses, which stimulate release of nitric oxide at the nerve endings on the arterial smooth muscle. erection is caused by **parasympathetic impulses** that pass from the sacral portion of the spinal cord through the pelvic nerves to the penis.
 

The diagram shows a cross-section of the penis during erection. The corpus cavernosum is shown filling with blood, causing the penis to become rigid. Labels include 'Corpus cavernosum fills with blood' and 'Testis'.
- 2. Lubrication:** **parasympathetic impulses** cause the urethral glands and bulbourethral glands to secrete mucus. Without satisfactory lubrication, the male sexual act is seldom successful because unlubricated intercourse causes grating, painful sensations that inhibit rather than excite sexual sensations.
- 3. Emission and ejaculation:** function of the **sympathetic nerves**.
 - Emission begins by contraction of the vas deferens and ampulla to cause expulsion of the sperm in the internal urethra. Contraction of the prostate and seminal vesicles to expel their fluid in the urethra (both urethral sphincters close). All these fluid mix in the internal urethra with the mucus secreted by the bulbourethral glands to form the semen. This process at this point is called **emission**³.
 - Filling of the internal urethra with semen** causes sensory impulses through pudendal nerves to the sacral region of the cord. Fullness of the internal urethra causes rhythmical contractions of the internal genital organs which increases their pressure to ejaculate the semen to the outside. This is called **ejaculation**.

The diagrams illustrate the physiological processes of emission and ejaculation. The top diagram, labeled 'Emission', shows the urethral bulb expanding like a balloon, the internal urethral sphincter contracting, and the ampulla of vas deferens, seminal vesicle, and prostate gland contracting. The bottom diagram, labeled 'Ejaculation', shows semen expelled, the internal urethral sphincter remaining contracted, the external urethral sphincter relaxing, and the penile urethra and muscles around the base of the penis contracting, while the rectal sphincter also contracts.

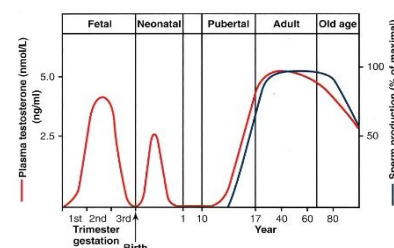
Testosterone and Other Male Sex Hormones

Secretion and chemistry of the male sex hormone:

- Secretion of testosterone by the interstitial cell of Leydig in the testis.
- The testis secretes several male sex hormones called androgens including testosterone, dihydrotestosterone and androstenedione. **Testosterone is the most abundant form, while dihydrotestosterone is the most active, and testosterone converted into dihydrotestosterone in the target cells.**
- Secretion of androgens in the body: from the adrenal glands and synthesized either from cholesterol or directly from acetyl coenzyme A.

Stimulation of testosterone release:

- During fetal life:** the testis are stimulated by **placenta chorionic gonadotropin** to produce testosterone throughout fetal life & the 10 weeks after birth then no more testosterone production during childhood.
- At puberty:** under the **anterior pituitary gonadotropic hormones** stimulation throughout life & then decline beyond 80 years to 50%.



³ Define as deposition of the seminal fluid into the posterior urethra الانبعاث

Metabolism of the male sex hormone:

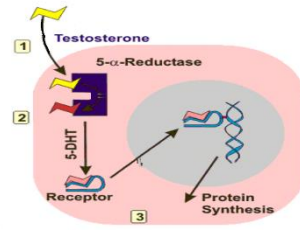
- Testosterone is bound to beta globulin, and circulates in the blood for 30 minutes to several hours, and it is converted to estrogen in the liver, and excreted either into the gut through liver bile or into the urine through the kidneys.

The basic intracellular mechanism of action of testosterone:

Testosterone "androgen" are not stored they are secreted once they are released " cell membrane can't protect them, vesicles can't contain them " they either go to the circulation or to the seminiferous tubules " once they bound to their receptors they cause gene expression.

It increases the rate of protein synthesis in target cells, by the following steps:

- (1) Testosterone converted by the intracellular enzyme 5 α reductase to dihydrotestosterone,
- (2) then it binds with cytoplasmic "receptor protein".
- (3) This combination moves to the nucleus where it binds a nuclear protein and **induces protein formation.**



Function of testosterone in fetal life & after puberty:

during fetal life

formation of male genital system & suppress formation of female genital sys.

cause descent of the testis into the scrotum

(during the last 2 to 3 months of gestation when the testis begin secreting reasonable quantities of testosterone) 10% of children their testis descend after birth in the first year. Some need surgery to descend it down.

enlargement of the penis, scrotum & testis & secondary sexual characteristics.

Growth of Hair

increase over the face, pubis, chest & abdomen (upward along the linea alba of the abdomen to the umbilicus) ..less often on the back

Baldness

testosterone cause baldness by 2 factors:
1) genetic background
2) large quantities of androgenic hormones

cause typical Adult Masculine voice, due to enlargement of the laryngeal mucosa

↑ thickness of the skin & Also it increases the secretion of the sebaceous glands (Gland in skin secrete oily matter) & sebaceous glands of the face causing acne

after puberty

↑ basal metabolic rate by about 15% (indirectly as a result of the anabolic effect).

The anabolic effect of testosterone is GREATER than the anabolic effect of estrogen

↑ protein formation and muscle development (**anabolic effect**)

↑ muscular development after puberty by 50% in muscle mass over that in female. Also increase in protein in non-muscle parts of the body.

↑ the reabsorption of Na⁺ in the distal tubules
Very weak aldosterone like effect

↑ red blood cells (due to increase metabolic rate).

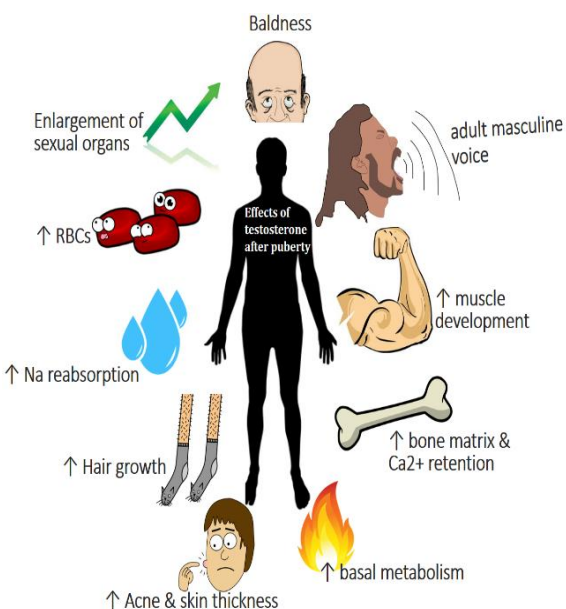
↑ bone matrix & causes Ca²⁺ retention (**anabolic effect***)

causes the epiphyses of the long bones to unite with the shafts of the bones & **early closure of the epiphyses**

has specific effect on the pelvis: narrow the pelvic outlet, lengthen it & cause the funnel-like shape

functions of testosterone

Testosterone in the fetal life cause development of male sex organs and later cause masculinization



*The increase in bone matrix is believed to result from the general protein anabolic function of testosterone plus deposition of calcium salts in response to

Abnormalities of male sexual function maturation

Prostate gland and its abnormalitis	<ul style="list-style-type: none"> • Benign prostatic fibroadenoma in older age due to overgrowth of prostate tissue (not caused by testosterone). • Cancer of the prostate gland caused by stimulation of cancerous cells by testosterone. 		
Hypogonadism in male:	<ul style="list-style-type: none"> • During fetal life when the testis are non-functional: none of the male sexual characteristics develop in the fetus. Instead female organs are formed. • If the boy loses his testis before puberty: a state eunuchism⁴ (he have infantile sex organs & infantile sexual characteristics) & the height of an adult eunuch is slightly greater than normal because of slow union of the epiphyses. • If a man is castrated⁵ after puberty: sexual organ regress in size and voice regress - loss of the thick masculine bones- loss of masculine hair production - loss of musculature of the virile male. 	Adiposogenital syndrome, Frohlich's syndrome or hypothalamic eunuchism:	hypogonadism due to genetic inability of the hypothalamus to secrete normal amount of GnRH & abnormality of the feeding center of the hypothalamus result in obesity with eunuchism.
Cryptorchidim:	<ul style="list-style-type: none"> • It's Failure of the testes to descend in the scrotum which normally occur during fetal life. • 10% of newborn males and it falls to 2% at age 1 year 0.3% after puberty They should be treated before puberty because of higher incidence of malignant tumors. 		
Testicular tumors and hypergonadism in male:	<ul style="list-style-type: none"> • Interstitial leydig cell tumors (rare), over production of testosterone. In children, causes rapid growth of the musculature and bones and early union of the epiphyses and causes excessive development of male sexual organs. • Tumor of the germinal epithelium (more common). 		

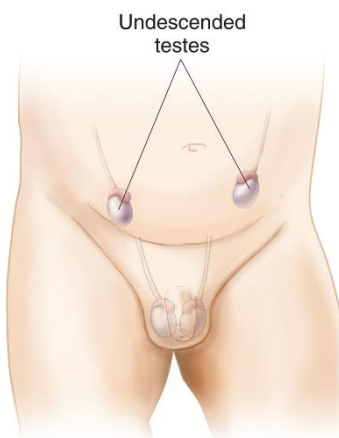
Other disorder (sertoli cell only syndrome): في ذي الحالة ماراح يكون عند المريض خلايا غير اليسرتولي فأكيد ماراح يكون عنده حيوانات منوية وبيصير عقيم

IMPORANTE POINT

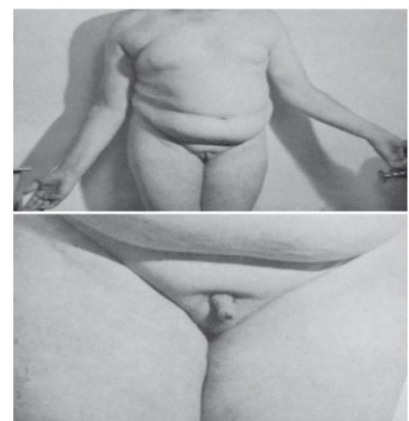
Effect of Temperature on Spermatogenesis.:

increasing the temperature of the testes can prevent spermatogenesis by causing degeneration of most cells of the seminiferous tubules besides the spermatogonia. It has often been stated that the reason the testes are located in the dangling scrotum is to maintain the temperature of these glands below the internal temperature of the body, although usually only about 2°C below the internal temperature.

ليه تنزل التيسيتيس لمكان خارج الحوض...؟ لأن عملية تصنيع الحيوانات المنوية تحتاج لحرارة أقل من الحرارة الموجودة في الجسم 37 درجة في الصيف لما يكون الجو حار راح تمتلئ التيسيتيس بالغدد العرقية ووبكون عندهم قدرة على الاستطالة علشان تساعد على تخفيف الحرارة في البرد راح تنقبض علشان تحافظ على الحرارة و ترتفع لمكان أقرب للجسم علشان تحافظ على مستوى معين من الحرارة واللي هو أقل من حرارة الجسم بدرجتين . لو ظلت التيسيتيس في الحوض راح يقل تصنيع الحيوانات المنوية بشكل كبير .



Cryptorchidim: undescended testes



Adiposogenital syndrome in an adolescent male. Note the obesity and childlike sexual organs.

⁴ The state of being a eunuch; absence of the testes or failure of the gonads to develop or function with consequent lack of reproductive and sexual function and of development of secondary sex

⁵ remove the testicles

SUMMARY

Definitions

Spermatogenesis	<ul style="list-style-type: none"> It's the formation of sperms, occurs in the seminiferous tubule due to stimulation Gonadotropin hormones, Begins usually at age 13 & ↓ by by aging
Sertoli cells	<ul style="list-style-type: none"> large cells with overflowing cytoplasmic envelope
Leydig cells	<ul style="list-style-type: none"> Lie between the seminiferous tubules. Numerous in the newborn male then disappear until puberty Active at puberty and throughout adult life and secrete testosterone.

Spermatogenesis

Hormonal Factors That Stimulate Spermatogenesis:

Hormone	Secreted By	Function
LH	Anterior pituitary	<ul style="list-style-type: none"> Stimulates the leydig cells to secrete testosterone.
FSH		<ul style="list-style-type: none"> Stimulates the sertoli cell Stimulate conversion of spermatids to sperm important for spermatogenesis
Growth hormone		<ul style="list-style-type: none"> controlling metabolic functions of the testis promotes early division of spermatogonias
Testosterone	Leydig cells	Essential for : <ul style="list-style-type: none"> growth division of the testicular germinal cells.
Estrogen	sertoli cell	<ul style="list-style-type: none"> Essential for spermatogenesis.

Developmental Events of sperm:

Formation	maturation	Storage	Capacitation
<ul style="list-style-type: none"> occurs in the seminiferous tubule. Spermatogonia ↓ primary spermatocytes ↓ secondary spermatocytes ↓ Spermatids (immature sperm) 	<ul style="list-style-type: none"> After 18 to 24 hour in the epididymis, sperm develop the capability of motility. Epididymis sertoli cells secrete nutrient fluid contain (testosterone& estrogens) which is essential for sperm maturation. Sperm activity enhanced in a neutral & slightly alkaline medium. life expectancy in the female genital tract is only 1 to 2 days. 	<ul style="list-style-type: none"> The majority stored in the vas deferens, maintaining their fertility for at least a month. Small amount of stored in the epididymis sperm kept inactive by multiple inhibitory substances in the secretion of the ducts. 	<p>1) sperm activated by female genital tract: Uterine and fallopian fluids wash away the inhibitory factors</p> <p>2) Acrosomal reaction: The sperm membrane becomes more permeable to Ca²⁺ ion which increase help to release the <i>hyaluronidase and proteolytic enzymes</i> from sperm acrosome which aid in penetrating the ovum.</p>

Seminal vesicles

- Secrete mucoid material containing fructose, citric acid & nutrient substances & large quantities of **prostaglandins*** & fibrinogen.
- *prostaglandins help in fertilization in two ways:**
- 1) Reacting female cervical mucus making it more receptive to sperm movement
 - 2) Causing backward reverse peristaltic contractions of the uterus & fallopian tubes to move the ejaculated sperm toward the ovaries

Prostate gland

- Secrete thin milky fluid contains Ca²⁺ ion, citrate ion, phosphate ion, a clotting enzyme & profibrinolysin.
- Functions of alkaline prostate fluid:**
- 1) **Important for** Successful fertilization of the ovum.
 - 2) help to neutralize the slightly acidic fluid of the vas deferens and other seminal fluids during ejaculation
 - 3) Enhances motility & fertility of sperm

Semen

- average pH is about 7.5.
- **Ejaculated semen during sexual act is composed of:**
 - Fluid & sperm from vas deferens (~10%).
 - Fluid from: prostate gland (~30%)& the seminal vesicles** (~60%).
 - Small amounts from the mucous glands** and the bulbourethral glands.

*The **alkaline prostatic fluid** helps to neutralize the mild acidity of other portions of the semen and gives the semen a milky appearance.

The **seminal vesicles and mucous glands fluid give the semen mucoid consistency.

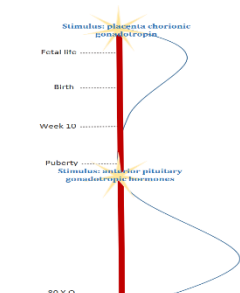
Effect of sperm count, morphology and motility on fertility:

Sperms quantity	Abnormal shape	Abnormal motility
35m - 200m sperm Sperm count below 20 m leads to infertility	count is normal but still infertile when it comes to shape of half of sperms .	shape is normal but either they are relatively non-motile or entirely non-motile which causes infertility.

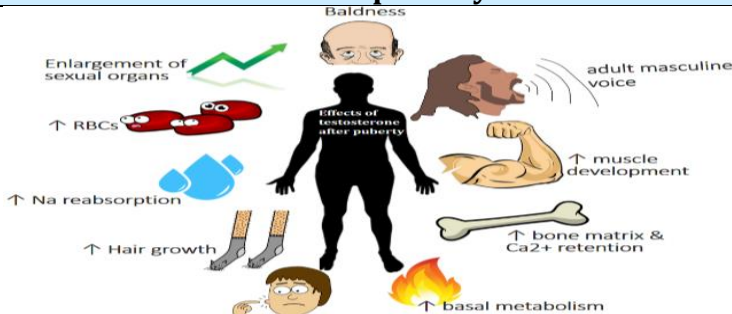
Stages of Male Sexual Act

1. **Penile erection:** process of filling the erectile tissue of the penis with blood at a pressure level near that of the arterial pressure. caused by **parasympathetic** impulses that pass from the sacral portion of the spinal cord.
2. **Lubrication:** **parasympathetic** impulses cause the urethral glands and bulbourethral glands to secrete mucous.
3. **Emission and ejaculation:** by **sympathetic** nerves impulses.

Testosterone and Other Male Sex Hormones

Secretion and chemistry of the male sex hormone:	Stimulation of testosterone release:	Testosterone Intracellular mechanism of action:
<ul style="list-style-type: none"> • The testis secretes several sex hormones called androgens including testosterone, dihydrotestosterone and androstenedione. • Testosterone is the most abundant form, while dihydrotestosterone is the most active. 	<ul style="list-style-type: none"> • During fetal life: the testis are stimulated by placenta chorionic gonadotropin to produce testosterone throughout fetal life & up to 10 weeks after birth. • At puberty: under the anterior pituitary gonadotropic hormones stimulation throughout life & then decline beyond 80 years to 50%.. 	<p style="text-align: center;">Timeline of Testosterone</p>  <p>(1) Testosterone converted by the intracellular enzyme 5 reductase to dihydrotestosterone, (2) then it binds with cytoplasmic "receptor protein". (3) moves to the nucleus where it binds a nuclear protein and induces protein formation.</p>

Function of testosterone in fetal life & after puberty

<p>fetal life:</p> <ul style="list-style-type: none"> • formation male genital system • formation of female genital sys • cause descent of the testis into the scrotum 	<p>after puberty:</p> 
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Abnormalities of male sexual function maturation

Prostate gland abnormalities	Adiposogenital syndrome, Frohlich's syndrome or hypothalamic eunuchism:	Cryptorchidism:	Testicular tumors and hypergonadism in male:
<ul style="list-style-type: none"> • Benign prostatic fibroadenoma in older age due to overgrowth of prostate tissue (not caused by testosterone). • Cancer of the prostate gland caused by stimulation of cancerous cells by testosterone. 	<p>Inability of Hypothalamus to secrete normal amount of GnRH</p>	<p>It's Failure of the testes to descend</p>	<p>Interstitial Leydig cell tumors Tumor of the germinal epithelium</p>

MCQs

1-The cells that lies within interstitium between seminiferous tubules:

- a. sertoli cells
- b. leydig cells
- c. spermatogonia
- d. all of them

2- in which stage in male reproductive system the sperm are motile:

- a. storage form in epididymis
- b. storage form in vas deference
- c. after ejaculation
- d. all of them

3- which of these are function of seminal vesicle:

- a. secrete mucoid material
- b. secrete nutrient substances
- c. secrete prostaglandins
- d. all of them

4- What is the function of prostate gland:

- a. secrete milky material
- b. secrete mucoid material
- c. secrete mucinous material
- d. none of them

5-Which of these structure secrete profibrinolysin:

- a. prostate gland
- b. vas deference
- c. epididymis
- d. all of them

6- what is the structure that secrete the highest composition of semen:

- a. prostate gland
- b. seminal vesical
- c. vas deference
- d. cooper gland

7- the count of sperm that considered to be infertile:

- a. less than 20M
- b. more than 20M
- c. between 20-40M
- d. less than 10M

8- the count of sperm that considered to be sterile:

- a. less than 20M
- b. more than 20M
- c. between 20-40M
- d. less than 10M

9- penile erection caused mainly by:

- a. parasympathetic innervation
- b. sympathetic innervation
- c. estrogen
- d. progesterone

10- what of these condition is mainly associated with untreated or late treatment of cryptorchidism:

- a. benign tumour
- b. malignant tumour
- c. none of them

Answer key:

1 (b) | 2 (c) | 3 (d) | 4 (a) | 5 (a) | 6 (b) | 7 (a) | 8 (d) | 9 (a) | 10 (b)



Thanks to this amazing team!

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