

مراجعة استعداد لامتحان وفق الهيكل الوزاري منهج انسابير



تم تحميل هذا الملف من موقع المناهج الإماراتية

موقع المناهج ← المناهج الإماراتية ← الصف التاسع المتقدم ← علوم ← الفصل الثاني ← ملفات متنوعة ← الملف

تاريخ إضافة الملف على موقع المناهج: 14:12:32 2025-03-18

ملفات اكتب للمعلم اكتب للطالب | اختبارات الكترونية | اختبارات | حلول | عروض بوربوينت | أوراق عمل
منهج انجليزي | ملخصات وتقارير | مذكرات وبنوك | الامتحان النهائي | للمدرس

المزيد من مادة
علوم:

التواصل الاجتماعي بحسب الصف التاسع المتقدم



صفحة المناهج
الإماراتية على
فيسبوك

الرياضيات

اللغة الانجليزية

اللغة العربية

التربية الاسلامية

المواد على تلغرام

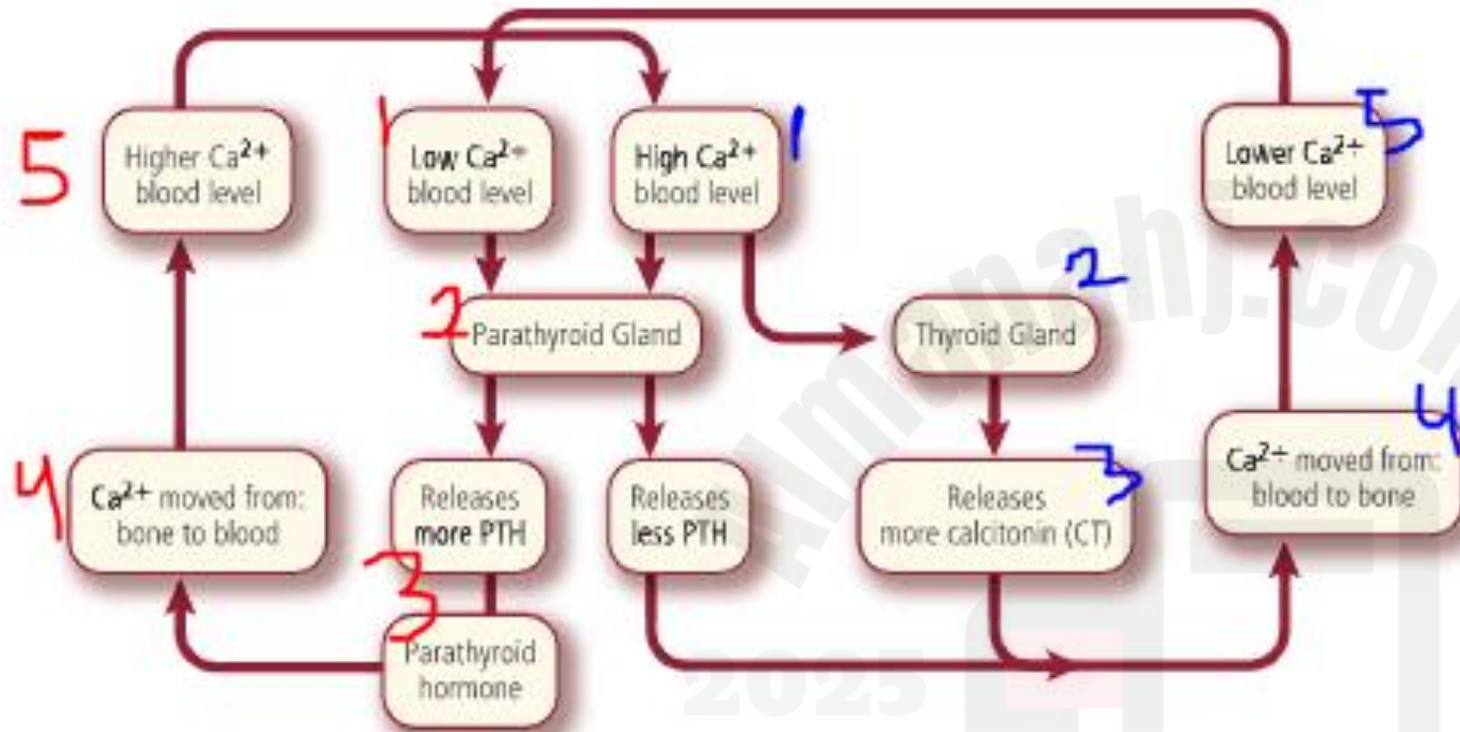
المزيد من الملفات بحسب الصف التاسع المتقدم والمادة علوم في الفصل الثاني

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مراجعة احياء من الهيكل

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The **parathyroid gland** secretes the parathyroid hormone, which **increases** the level of Calcium in the blood

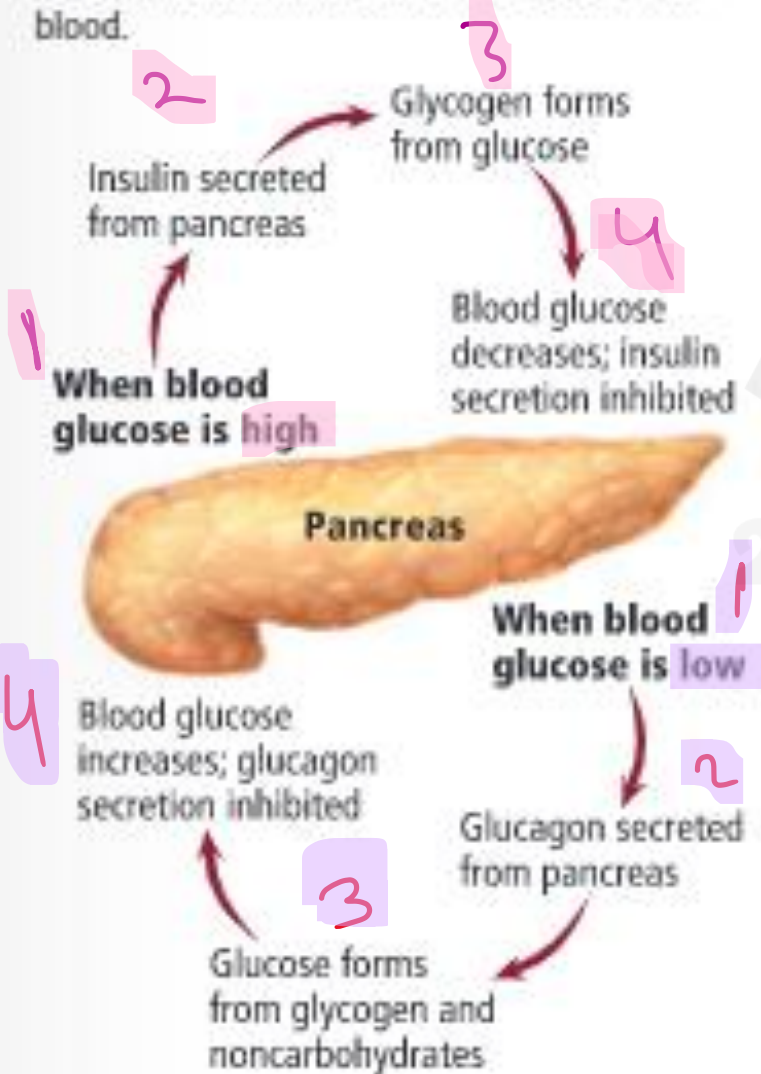
The **thyroid gland** secretes the hormone calcitonin, which **lowers** levels Calcium in the blood

Remember that these hormones have an **anti-bulimic** effect, and they work **against/opposite** each other

as they work together, they maintain homeostasis

The pancreas also secretes the hormones insulin and glucagon

Figure 18 Glucagon and insulin work together to maintain the level of sugar in the blood.



pancreas secretes the hormones **insulin** and **glucagon**.

insulin = When blood glucose levels are low, glucagon is released from the pancreas.

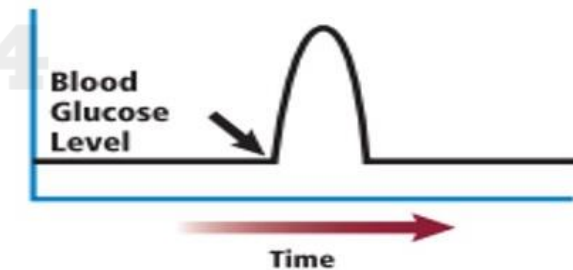
glucagon = Glucagon binds to liver cells, signaling them to convert glycogen to glucose and release the glucose into the blood.

Which hormones are released from nerve cells rather than from endocrine glands?

- A. antidiuretic hormone and oxytocin
- B. growth hormone and thyroxine
- C. insulin and glucagon
- D. norepinephrine and epinephrine

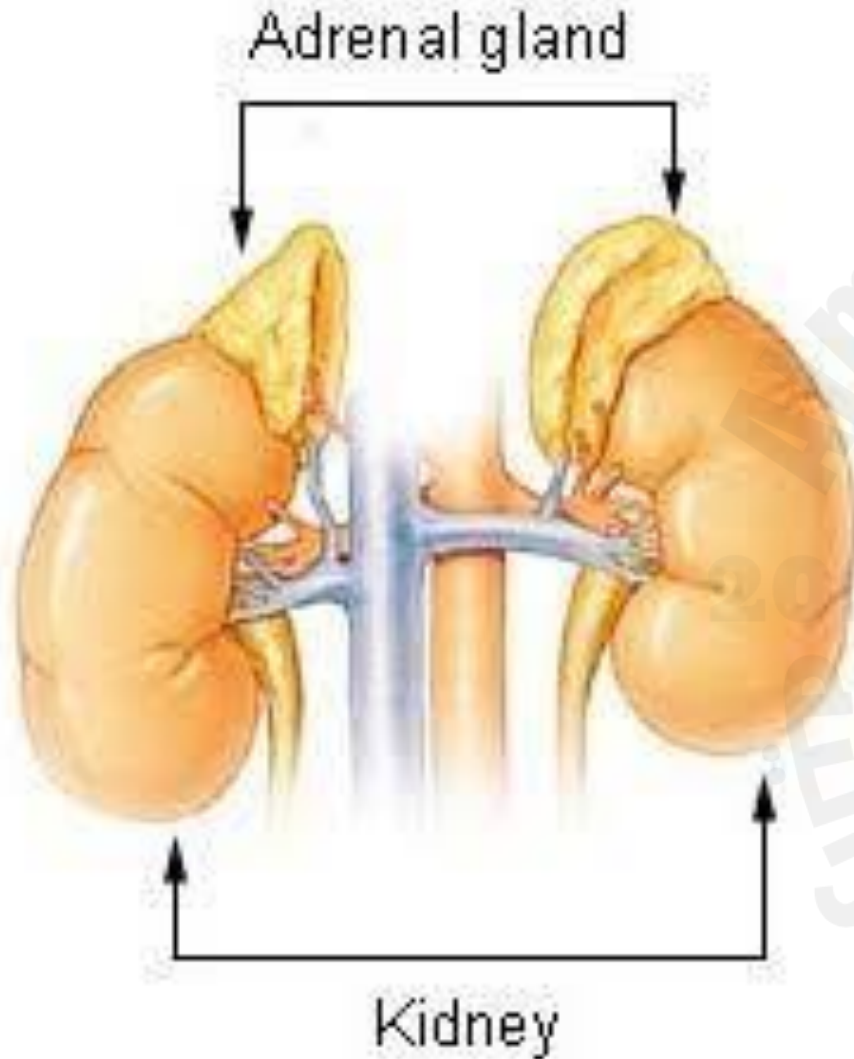
Which pairs of hormones have opposite effects?

- A. calcitonin and parathyroid hormone
- B. epinephrine and norepinephrine
- C. growth hormone and thyroxine
- D. aldosterone and cortisol



The graph shows blood glucose levels over a period of time. Which hormone might have caused a sudden surge as indicated by the arrow?

- A. antidiuretic hormone
- B. growth hormone
- C. **glucagon**
- D. insulin



Aldosterone primarily affects the kidneys and is important for reabsorbing sodium.

Cortisol, another glucocorticoid, raises blood glucose levels and also reduces inflammation

An “adrenaline rush” occurs when there seems to be a sudden burst of energy during a stressful situation.

The inner portions of the adrenal glands secrete epinephrine (adrenaline), norepinephrine.

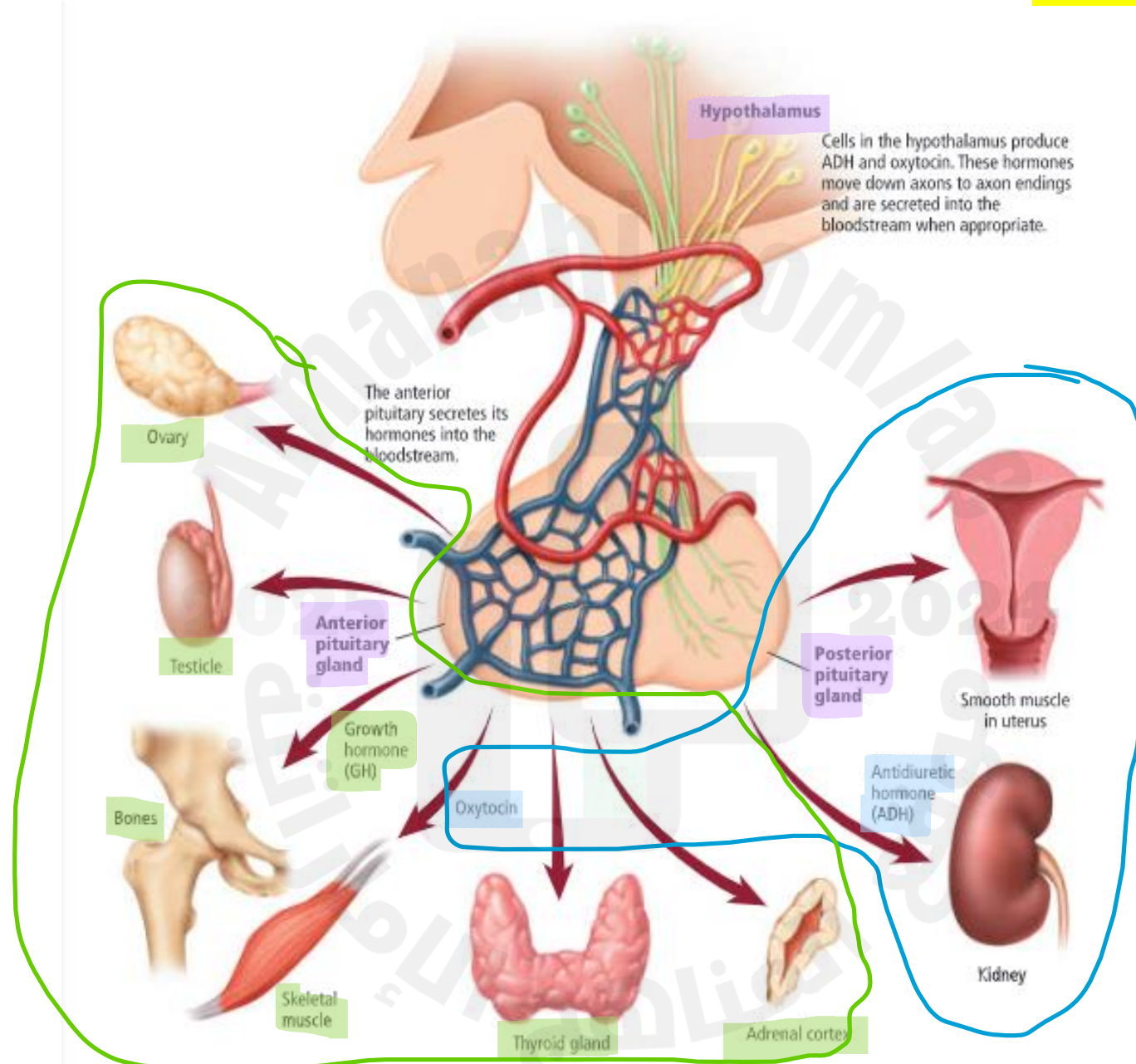
Together, these hormones increase **heart rate**, **blood pressure**, **breathing rate**, and **blood sugar levels**, all of which are important in **increasing the activity of body cells**

Anterior gland produces:

1. Growth hormones.

2. Regulate glands that are ovaries, testes, thyroid gland and adrenal gland.

The hypothalamus maintains homeostasis.



Posterior glands produces:

1. ADH.

2. oxytocin as needed by the body.

Hypothalamus: The part of the brain that connects the endocrine glands and the nervous system and controls the pituitary gland.

It is **located** between the brainstem and the cerebrum.
Its **function** is to maintain the internal balance of the body.
It **produces** two hormones that are stored in the back of the pituitary gland

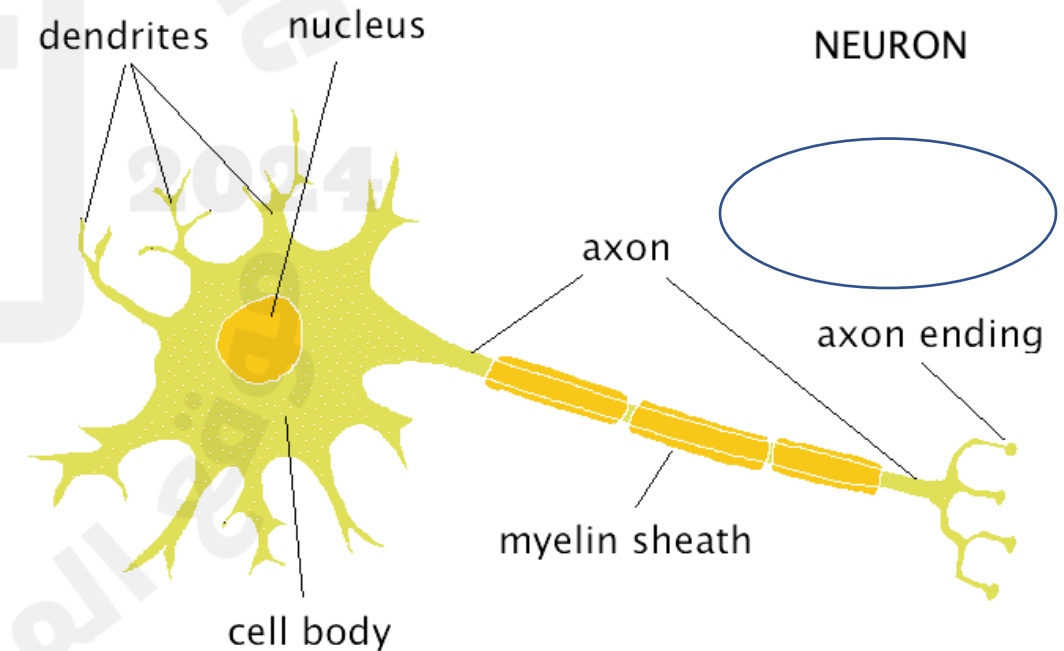
Antidiuretic hormone: regulates the water level in the body

Oxytocin: affects the smooth muscles of the uterus, which helps to increase

The **hypothalamus produces two hormones**, oxytocin and antidiuretic hormone (ADH).

These hormones are transported through **axons** and **stored in axon endings** located in the pituitary gland

The antidiuretic hormone functions in homeostasis by **regulating water balance**.



The antidiuretic hormone functions in homeostasis by **regulating water balance**.

When u become dehydrated, cells in your hypothalamus detect that you are dehydrated (that the level of water in the blood is low), it will respond by releasing ADH from axons in the pituitary gland that have been storing the hormone.

Calcium regulation

#when calcium increase in blood → hypothalamus indicate → activate the pituitary gland → thyroid gland → produce calcitonin → reduce the amount of calcium in blood by stimulate the absorption of calcium by the bones .

#when calcium decrease in blood → hypothalamus indicate → pituitary gland → parathyroid gland → parathyroid hormones → increase the calcium in blood by stimulating the bones and other tissues to release the calcium to the blood and inhibit the small intestine to absorb calcium from the food.

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Sugar (glucose) regulation

glucose increase in blood (hyperglycemia) → hypothalamus indicate → activate pituitary gland → pancreas → Insulin → decrease the blood sugar level by stimulate the liver and muscles to absorb sugar from the blood and convert it into glycogen.

glucose decrease in blood → hypothalamus indicate → activate pituitary gland → pancreas → glucagon increases the blood sugar by stimulate the liver and other tissue breaking down the glycogen and release the glucose to blood.

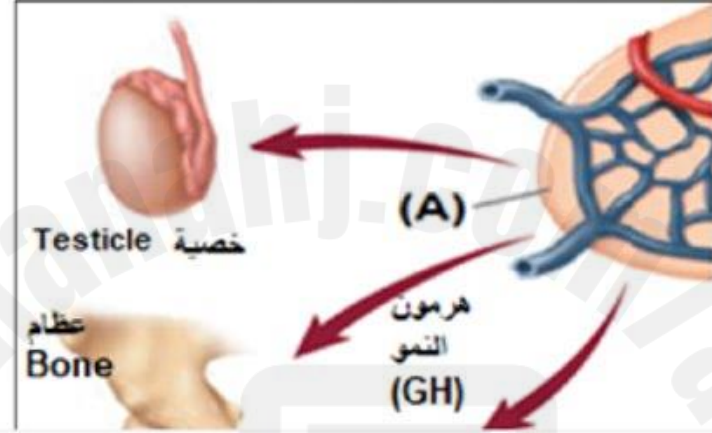
Water regulation.

If the water increase in blood → hypothalamus indicates → activate pituitary gland → produce ADH
→ Go to the kidney → decrease (inhibit) the reabsorption of water → decrease the water in blood and decrease amount of water in the urine.

Water decrease in blood → hypothalamus indicate → activate pituitary gland → inhibit (decrease)
production of ADH → cause increase of reabsorption of water → increase water in blood and decrease it in the urine.

The figure below shows the effect of an endocrine gland on some organs of the body, study it and then answer the question:

Which of the following is indicated by the structure (A) in the figure?



ل أدناه يوضح تأثير غدة صماء على بعض
أعضاء الجسم،تمعنه ثم أجب عن السؤال:
ما يلي يشير إليه التركيب (A) في الشكل؟

a. Adrenal glands

الغدة الكظرية

b. Posterior pituitary gland

الفص الخلفي للغدة النخامية

c. Anterior pituitary gland

الفص الأمامي للغدة النخامية

d. Hypothalamus

تحت المهاد

In the case of dehydration, the antidiuretic hormone binds to kidney cells causing.....

في حال كنت مصاب بالجفاف، يرتبط الهرمون المضاد لإدرار البول بالمستقبلات الموجودة على خلايا الكلية مما يتسبب في.....

a. The kidney to reabsorb more water and increase the amount of water in the urine

إعادة امتصاص الكليتين للمزيد من الماء وزيادة الماء في البول

b. The kidney to reabsorb more water and decrease the amount of water in the urine

إعادة امتصاص الكليتين للمزيد من الماء وتقليل الماء في البول

c. The kidney to excrete more water and decrease the amount of water in the urine

إدرار الكليتين للمزيد من الماء وتقليل الماء في البول

d. The kidney to excrete more water and increase the amount of water in the urine

إدرار الكليتين للمزيد من الماء وزيادة الماء في البول

Which pairs of hormones have **opposite effects**?

أي من المجموعات الثنائية من الهرمونات التالية لها **تأثيرات متضادة**؟

a. Epinephrine and norepinephrine

الإبينفرين والنورإبينفرين

b. Growth hormone and thyroxine

هرمون النمو والثيروكسين

c. Aldosterone and cortisol

الألدوستيرون والكورتيزول

d. Calcitonin and parathyroid hormone

الكالسيتونين وهرمون الباراثورمون

Which endocrine gland would provide a burst of energy to a person moving out of the way of a speeding bicycle?

أي غدة صماء تقدم دفعة من الطاقة
لشخص يخرج عن طريق دراجة مسرعة؟

Learning Outcomes Covered

o 1.1.12

a.

Thyroid

الدرقية

b.

Pituitary

النخامية

c.

Parathyroid

الغارات الدرقية

d.

Adrenal

الكظرية



Which hormones are released from nerve cells rather than from endocrine glands?

أي من الهرمونات التالية تفرزه الخلايا العصبية بدلاً من الغدد الصماء؟

Learning Outcomes Covered

o 1.1.10

a. ☐
النورإبينفرين والإبينفرين
Norepinephrine and epinephrine

b. ☐
الأنسولين والجلوكاجون
Insulin and glucagon

c. ☐
هرمون النمو والثيروكسين
Growth hormone and thyroxine

d. ☒
الهرمون المضاد لإدرار البول والإوكسيتوسين
Antidiuretic hormone and oxytocin

The antidiuretic hormone regulates _____.
يُنظِّم الهرمون المضاد لإدرار البول _____.

Learning Outcomes Covered

◦ 1.1.10

a. Calcium الكالسيوم

b. Glucose الجلوكوز

c. Sodium الصوديوم

d. Water الماء



In the case of dehydration, the antidiuretic hormone binds to kidney cells causing_____.

في حال كنت مصاب بالجفاف، يرتبط الهرمون المضاد لإدرار البول بالمستقبلات الموجودة على خلايا الكلية مما يتسبب في_____.

إعادة امتصاص الكليتين للمزيد من الماء وتقليل الماء في البول

a. The kidney to reabsorb more water and decrease the amount of water in the urine



إعادة امتصاص الكليتين للمزيد من الماء وزيادة الماء في البول

b. The kidney to reabsorb more water and increase the amount of water in the urine

إدرار الكليتين للمزيد من الماء وتقليل الماء في البول

c. The kidney to excrete more water and decrease the amount of water in the urine

إدرار الكليتين للمزيد من الماء وزيادة الماء في البول

d. The kidney to excrete more water and increase the amount of water in the urine

Based on the photos below, which person is likely to have high levels of epinephrine?

استناداً الى الصور أدناه، أي الشخصين مرشح لمستويات مرتفعة من الإيبينفرين؟



- a. Person B الشخص B
- b. Neither person لا أحد منهما
- c. Both persons كلا الشخصين
- d. Person A الشخص A

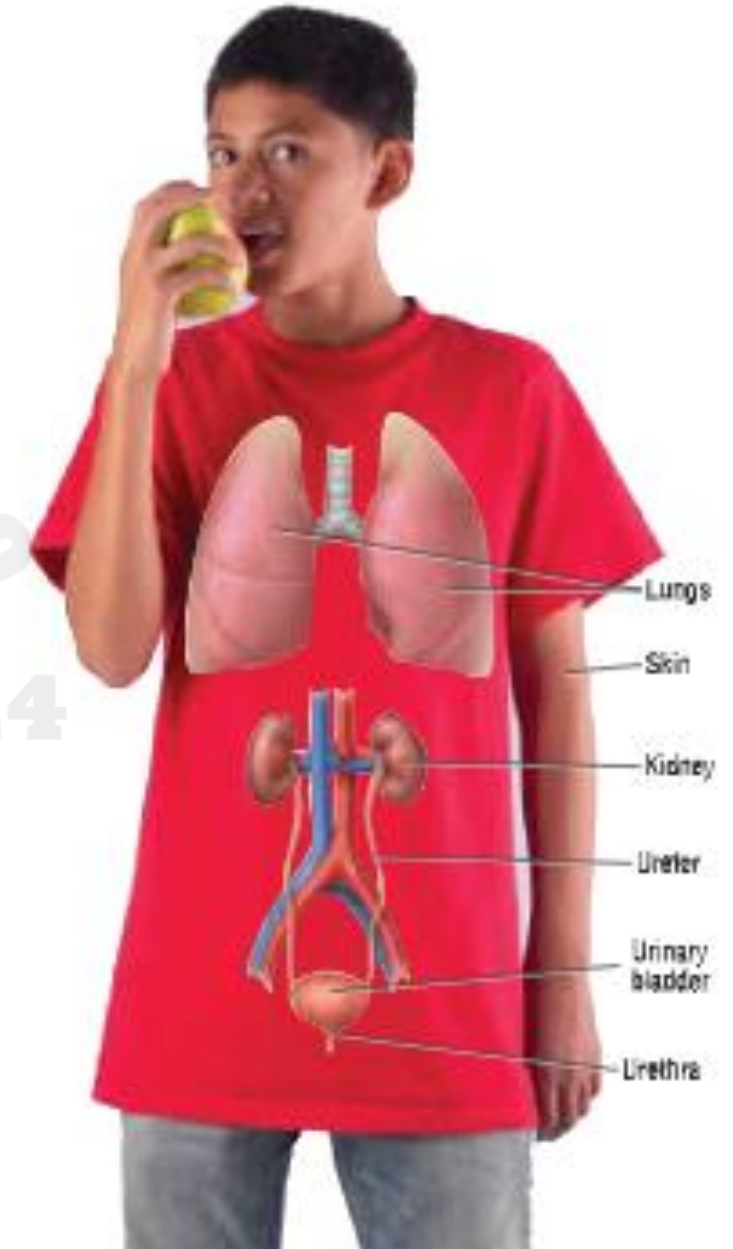


The excretory system removes these toxins and wastes from the body.

Excretory system remove waste and extra fluids from the blood, regulate the Ph of blood

The components that make up the excretory system include the lungs, skin, and kidney.

Endocrine system produce hormones to regulate the body functions



kidneys are bean-shaped organs that filter out wastes, water, and salts from the blood.

The outer portion is called the **renal cortex** and the inner region is called the **renal medulla**.

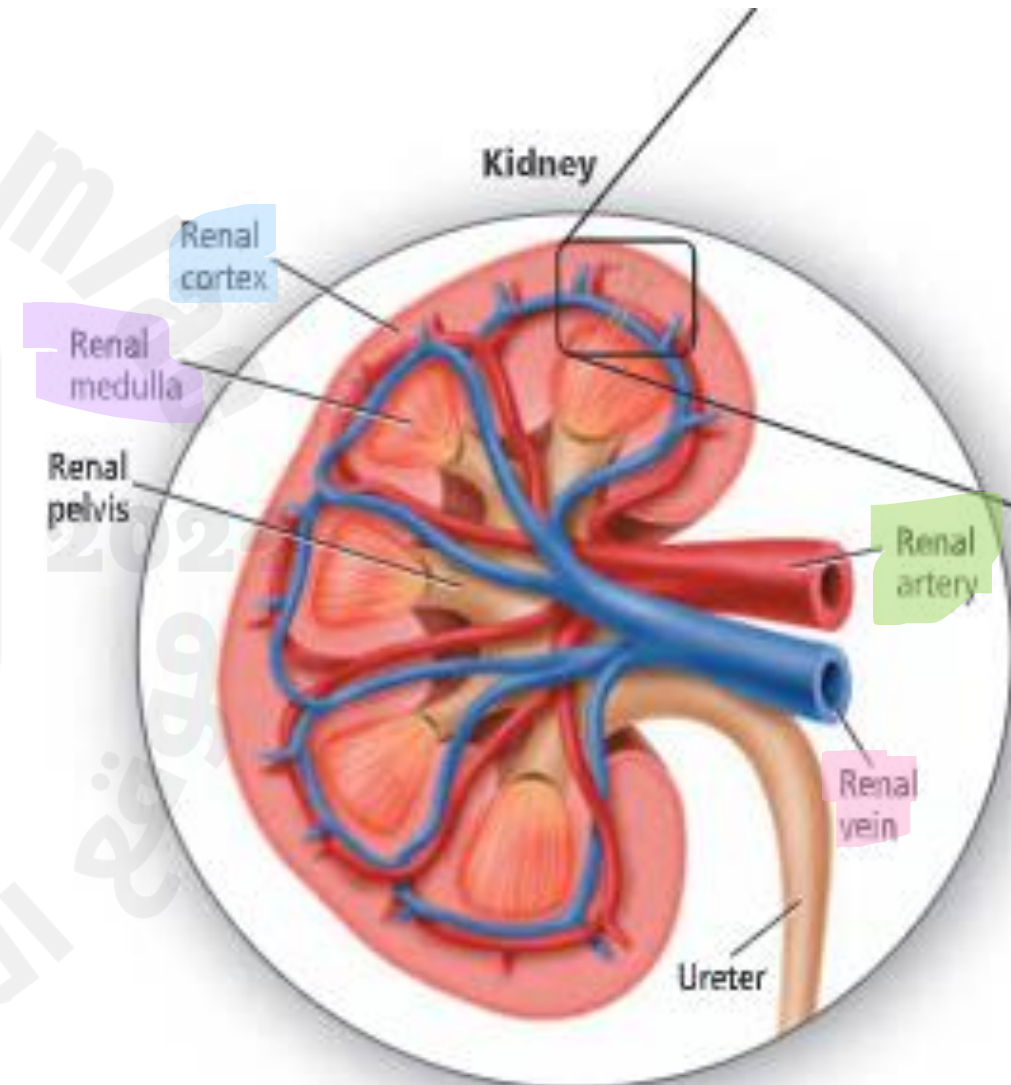
Each kidney contains approximately **one million** filtering units called nephrons

Nephrons are located in the **renal medulla**

The **renal artery** transports nutrients and wastes to the kidney

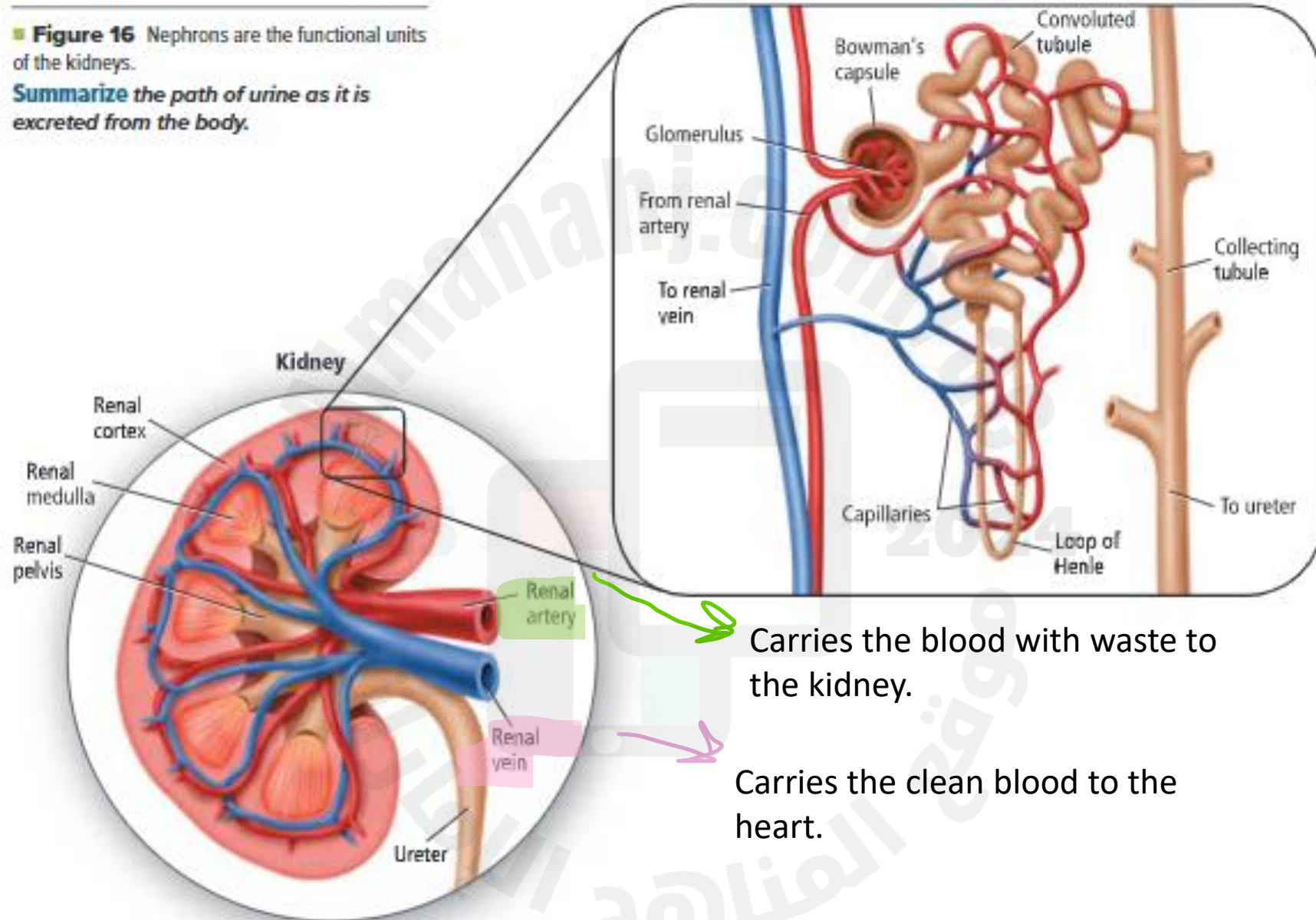
Larger molecules, such as red blood cells and proteins, remain in the bloodstream.

nitrogenous waste product called **urea**



■ **Figure 16** Nephrons are the functional units of the kidneys.

Summarize the path of urine as it is excreted from the body.



how does the kidney regulate the PH of the blood (6.5 – 7.5)

When the PH is too low the kidney increase the level of PH by excreting hydrogen (H^+) And ammonia into the renal tubules.

When pH is low



If PH is too high the kidney can decrease the level of PH by reabsorbing buffers such as bicarbonate (HCO_3^-) AND SODIUM IONS (Na^+).

When pH is high



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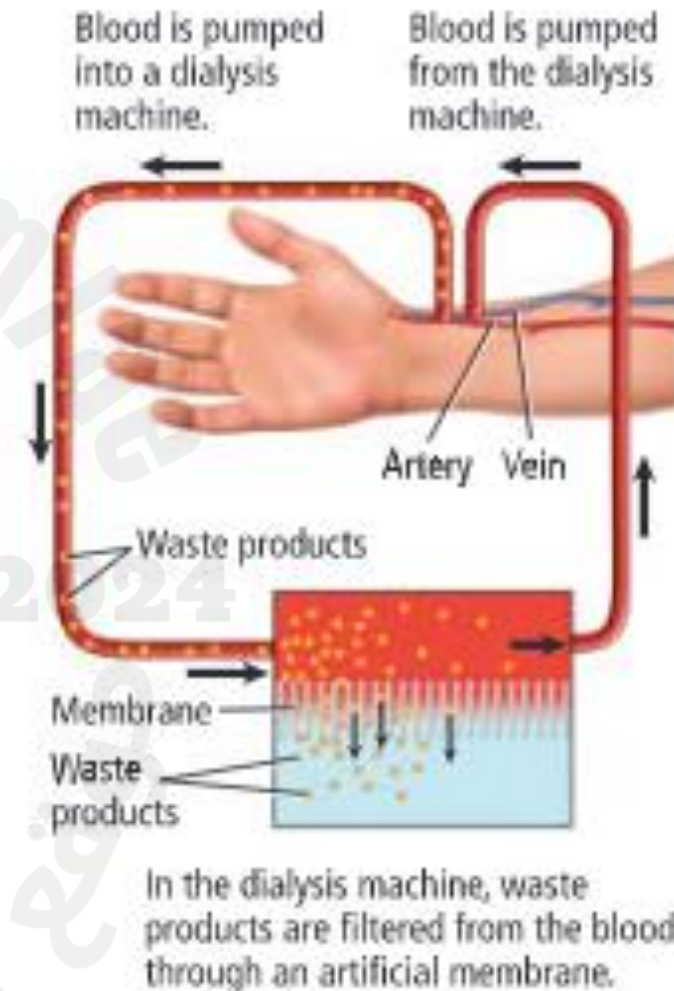
Table 3 Common Excretory Disorders	
Excretory Disorder	Brief Description
Nephritis	Inflammation of the glomeruli can lead to inflammation of the entire kidneys. This disorder can lead to kidney failure if it is left untreated.
Kidney stones	Hard deposits form in the kidneys that might pass out of the body in urine. Larger kidney stones can block urine flow or irritate the lining of the urinary tract, leading to possible infection.
Urinary tract blockage	Malformations present at birth can lead to blockage of the normal flow of urine. If it is untreated, this blockage can lead to permanent damage of the kidneys.
Polycystic (pah lee SIHS tihk) kidney disease	This is a genetic disorder distinguished by the growth of many fluid-filled cysts in the kidneys. This disorder can reduce kidney function and lead to kidney failure.
Kidney cancer	Uncontrolled cell growth often begins in the cells that line the tubules within the kidneys. This can lead to blood in the urine or a mass in the kidneys, or it can affect other organs as the cancer spreads, which can lead to death.

Kidney Treatments

Dialysis is a procedure in which an artificial kidney machine filters out wastes and toxins from a patient's blood.

A kidney transplant is the surgical placement of a healthy kidney from another person, called a donor, into the patient's body.

Steroids and cyclosporine are medicines that the patient takes before undergoing organ transplants, to prevent rejection by the body.



Use your book to define each term.

kidney bean-shaped organ that filters out wastes, water, and salts from the blood

urea nitrogenous waste product that is a component of urine

Describe three functions of the excretory system that help maintain homeostasis of the body.

1. removes metabolic wastes from the body
2. regulates the amount of fluid and salts in the body
3. maintains the pH of the blood

Review the vocabulary terms found on the Study Guide page. Use the terms to answer the following questions.

26. Where are nephrons located? **renal medulla**

27. Which waste product is found in urine? **Urea, toxins, excess fluids**

Understand Main Ideas

28. Where is the loop of Henle?

- A. renal tubule**
- B. glomerulus
- C. Bowman's capsule
- D. urethra

29. **THEME FOCUS Homeostasis** Which one of the kidney functions conserves water in the body?

- A. absorption
- C. reabsorption**
- B. filtration
- D. breathing

30. Which process returns glucose to the blood?

- A. excretion
- C. reabsorption**
- B. filtration
- D. exhalation

Use the table below to answer questions 31, 32, and 33.

Reabsorption of Some Substances in the Kidneys			
Chemical substance	Amount Filtered by Kidneys (g/day)	Amount Excreted by Kidneys (g/day)	Percent of Filtered Chemical Reabsorbed (per day)
Glucose	180	0	100
Urea	46.8	23.4	50
Protein	1.8	1.8	0

31. Based on the data from the table above, how much urea is reabsorbed by the kidneys?

- A. 0.50 g/day
- B. 23.4 g/day**
- C. 46.8 g/day
- D. 50.0 g/day

32. Based on the table data above, what happens to glucose in the kidneys?

- A. It is reabsorbed into the blood.**
- B. It is permanently filtered out of the blood.
- C. It is treated in the kidney like creatinine.
- D. It is treated in the kidney like urea.

33. Infer why proteins are not removed by nephrons.

- A. The collecting ducts are too small.
- B. Proteins cannot be filtered.
- C. Proteins never enter the nephron.**
- D. Proteins are reabsorbed by nephrons.

3. Compare and contrast filtration and reabsorption in a nephron.

Filtration is the process of removing wastes from the blood. Reabsorption is the process of returning useful materials, such as glucose and water, to the bloodstream.

4. Explain how kidney disorders may result from genetic or environmental factors and how the disorder can affect an individual.

Polycystic kidney disorder is a genetic disorder distinguished by the growth of many fluid-filled cysts in the kidneys. This disorder can reduce kidney function and lead to kidney failure. Kidneys can be damaged by prescription and illegal drug use.

5. Hypothesize why kidney failure without dialysis can result in death.

Kidney failure can lead to death because without kidneys, toxic wastes can build up in the blood and poison the body.

6. Calculate the average amount of urine that the body produces in a week.

$1.5 \text{ L/day} \times 7 \text{ days} = 10.5 \text{ L}$

Summarize information about kidney disorders in the table below.

Disorder	Symptoms	Common Causes	Treatments
Kidney infection	fever, chills, and mid- to low-back pain	bladder infection that spreads; obstructions in kidney	antibiotics
Nephritis	blood in urine; swelling of body tissues; protein in urine	large particles in bloodstream lodge in glomeruli, causing inflammation	special diet; prescription drugs
Kidney stones	pain	crystallized solids, such as calcium, form in kidney	ultrasonic sound waves; surgery

Describe the two types of treatments for reduced kidney function or complete kidney failure.

Dialysis: Dialysis is a procedure in which an artificial

kidney machine filters out wastes and toxins from a patient's blood.

kidney transplant: A kidney transplant is the surgical placement of a

healthy kidney from another person, called a donor, into the patient's

body.

Nitrogenous waste product of the excretory system is known as urea.

- ☒ True
- ☐ False

16. If the kidney reabsorbs buffers such as bicarbonate (HCO_3^-) and sodium (Na^+) ions, pH levels will:

- a) equalize b) increase c) decrease d) remain same

17. If the kidneys excrete H^+ and ammonia into the renal tubules, the pH levels will:

- a) equalize b) increase c) decrease d) remain same

15. In the major excretory system, much of the lost water is absorbed back into the capillaries surrounding the renal tubule. This process is known as:

- a) filtration b) dialysis
- c) hydration d) reabsorption

19. Which of the following is the correct sequence of excretion of waste:

- a) bowman's capsule-ureter-urethra-loop of henle
- b) loop of henle-bowman's capsule-ureter-urethra
- c) bowman's capsule-loop of henle-ureter-urethra
- d) loop of henle-bowman's capsule-urethra-ureter

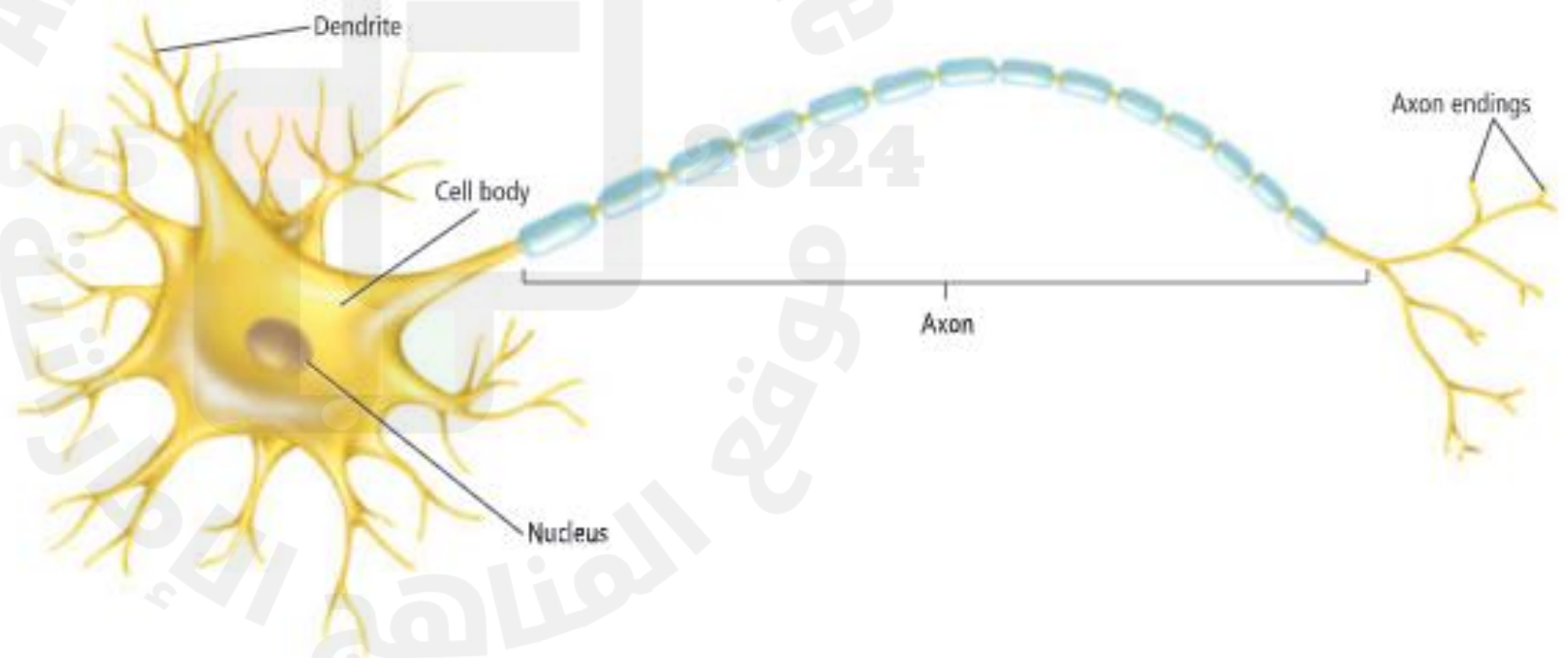
Neurons are specialized cells that help you gather information about your environment, interpret the information, and react to it.

Dendrites receive signals called impulses from other neurons and conduct the impulses to the cell body

The nucleus of the neuron and many of the cell organelles are found in the **cell body**.

axon carries the nerve impulse from the cell body to other neurons and muscles.

neuron :

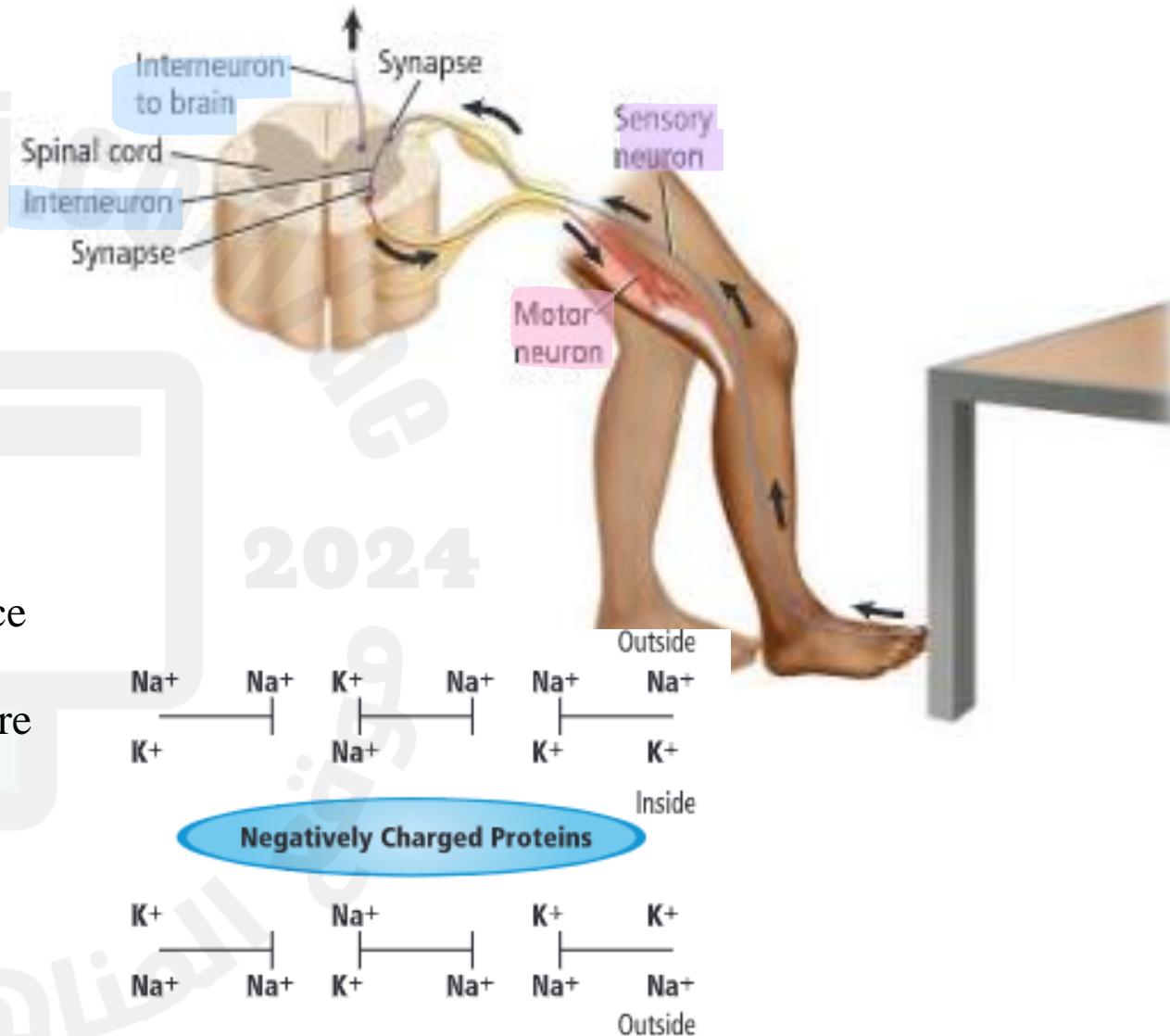


There are three kinds of neurons: sensory neurons, interneurons, and motor neurons.

Sensory neurons send impulses from receptors in the skin and sense organs to the brain and spinal cord.

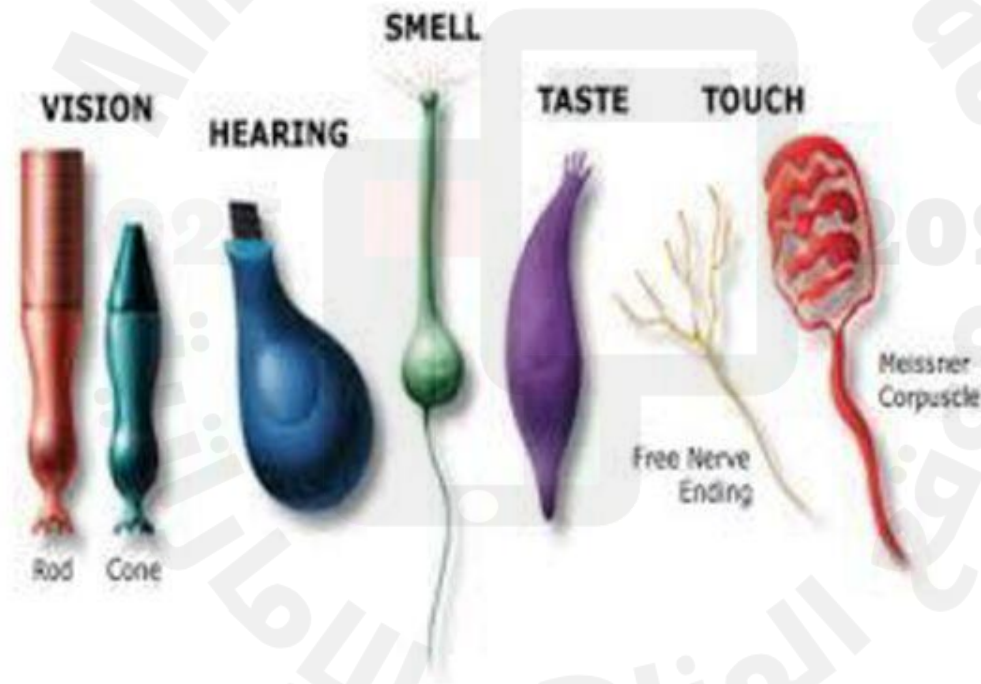
Interneurons carry the impulse to motor neurons, which carry impulses away from the brain and spinal cord to a gland or muscle, which results in a response.

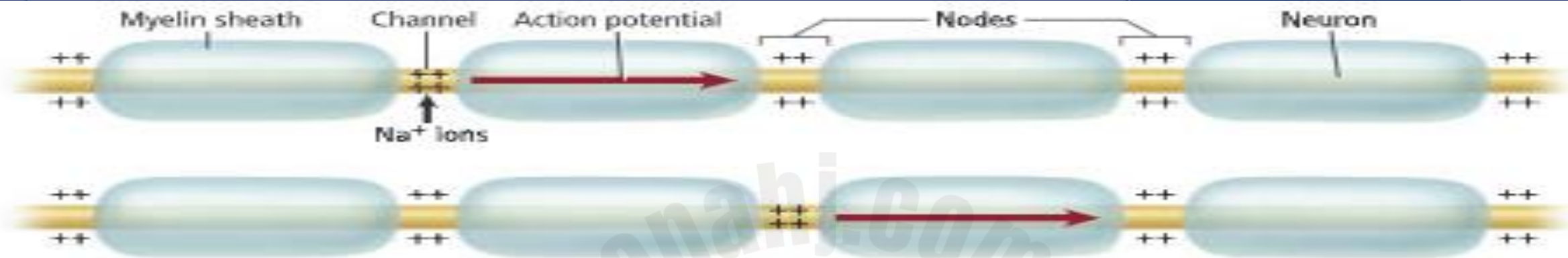
When a neuron is at rest, it is not conducting an impulse. Notice that there are more sodium ions (Na^+) outside the cell than inside the cell. The reverse is true for potassium ions (K^+), there are more potassium ions inside the cell than outside the cell



What is a sensory receptor?

- They keep us aware of our internal body or external world
- A specialized cell (not a protein) or a specialized dendritic ending (e.g. pacinian corpuscle) or free nerve ending





The myelin sheath has many gaps, called **nodes**

Sodium ions and potassium ions cannot diffuse through myelin, but they can reach the plasma membrane at these nodes. This allows the action potential to jump from node to node, greatly increasing the speed of the impulse as it travels the length of the axon

5. Which is the correct path that a nerve impulse will follow in a reflex arc?
- A. motor neuron → interneuron → sensory neuron
 - B. interneuron → motor neuron → sensory neuron
 - C. motor neuron → sensory neuron → interneuron
 - D. sensory neuron → interneuron → motor neuron

For each set of terms below, choose the one term that does not belong and explain why it does not belong.

- 1. axon, dendrite, reflex arc not structure of neuron
- 2. cell body, synapse, neurotransmitter not part of synapse
- 3. myelin, node, threshold not structure of myelinated neuron

6. **THEME FOCUS Energy** Hypothesize why it takes more energy for a nerve impulse to travel along an axon that lacks myelin as opposed to an axon that has myelin.
7. **MAIN Idea** Explain the following analogy: A neuron is like a one-way street, while a nerve is like a two-way street.

6. Because nerve impulse move in every single point of nonmyelinated neurons that mean all sodium potassium ATPase pump will work which need to consume more energy.

7. In single neuron the nerve impulse move in one direction (dendrites → cell body → axon → axon ending) but a nerve is a bundle of sensory and motor neurons which carry the nerve impulse to and from the brain in two opposite directions.

خلايا متخصصة تساعد على جمع معلومات عن البيئة وتفسير تلك المعلومات. Specialized cells help to collect information about the environment and interpret that information.

- ☐ animal cells الخلية الحيوانية
- ☐ plant cells الخلية النباتية
- ☒ neuron (nerve cell) الخلية العصبية ✓
- ☐ epithelial cell الخلية الطلائية

أي من تراكيب الخلية العصبية تستقبل السيال العصبي من خلية أخرى which structure of neuron that receive nerve impulses .

- ☐ axon المحور
- ☒ Dendrites الزوائد الشجرية ✓
- ☐ cell body جسم الخلية
- ☐ axon ending نهايات المحور

أي من تراكيب الخلية العصبية تستقبل السيال العصبي من خلية أخرى which structure of neuron that receive nerve impulses .

- ☐ axon المحور
- ☒ Dendrites الزوائد الشجرية ✓
- ☐ cell body جسم الخلية
- ☐ axon ending نهايات المحور

أي من تراكيب الخلية العصبية تنقل السيال العصبي من جسم الخلية إلى خلية أخرى structures of the nerve cell transmits the nerve impulse from the cell body to another cell

- ☒ axon المحور ✓
- ☐ Dendrites الزوائد الشجرية
- ☐ cell body جسم الخلية
- ☐ axon ending نهايات المحور

ما الخلية العصبية التي تنقل السيالات العصبية من الدماغ أو الحبل الشوكي إلى العضلات أو الغدد؟
the nerve cell that transmits nerve impulses from the brain or spinal cord to the muscles or glands?

☐ sensory neurons الحسية

☒ motor neurons الحركية ✓

☐ inter neurons (brain + spinal cord) البينية (الدماغ + الحبل الشوكي)

Which of the following sentences are correct for the myelin sheath
أي الجمل التالية صحيحة فيما يتعلق بالغلاف المايليني

☐ speed up nerve impulse تسريع السال العصبي

☐ isolate axon عزل المحور

☐ It consists of lipids يتكون من دهون

☒ All of the above جميع ما سبق ✓

ما الخلية العصبية التي تستقبل السيالات العصبية من المستقبلات الحسية وتنقلها للدماغ أو الحبل الشوكي؟
nerve cell that receives nerve impulses from sensory receptors and transmits them to the brain or spinal cord?

☒ sensory neurons الحسية ✓

☐ motor neurons الحركية

☐ inter neurons (brain + spinal cord) البينية (الدماغ + الحبل الشوكي)

which of the following neurons transmit the nerve flow
الخلايا العصبية المسؤولة عن نقل الالم الحاد

☒ myelinated المايلينية



☐ nonmyelinated الغير مايلينية

☐ interneuron البينية

which of the following neurons transmit the nerve flow
الخلايا العصبية المسؤولة عن نقل الالم الخفيف

☐ myelinated المايلينية

☒ nonmyelinated الغير مايلينية

☐ interneuron البينية

وظيفة القنطرة pons function

control breathing rate, heart rate, and blood pressure. ينظم معدل التنفس وضربات القلب وضغط الدم

regulates body temperature, thirst, appetite, and water balance ينظم درجة حرارة الجسم والعطش والشهية وتوازن الماء

relays signals between the cerebrum and the cerebellum ينقل الإشارات بين المخ والمخيخ



memory, language, speech, voluntary body movements الذاكرة واللغة والكلام وحركات الجسد الإرادية

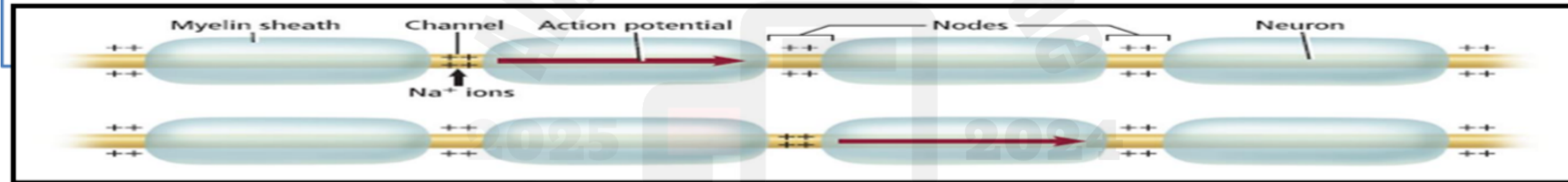
2. What are the gaps on the myelin sheath called? ما هي الفراغات في الغمد المايليني
axons B. thresholds C. **nodes** عقد D. cell bodies

A.

Feedback: Myelinated axons contain gaps called nodes. Sodium and potassium ions are able to jump from node to node rather than diffusing through the myelin. This increases the speed of the impulse

3. What does this figure represent?

- A. **a nerve impulse on a myelinated axon** سيال عصبي في محور مايليني
B. potassium diffusing through myelin
C. a non-myelinated nerve impulse
D. a reflex arc



2. The _____ nervous system carries impulses from the central nervous system to the heart and other organs.

- A. Autonomic الذاتي B. somatic C. cerebral D. muscular

Feedback: The autonomic nervous system controls many involuntary functions of bodily organs. Its impulses move away from the central nervous system to other parts of the body. الجهاز العصبي الذاتي يتحكم في الوظائف اللاإرادية

4. Which of the statements is true of reflexes? ما هو الصحيح بالنسبة لقرس الانعكاس

- A. All reflex signals must go to the brain. B. They require conscious thought.
C. They are slow and gradual responses
D. They are involuntary لا ارادية

Feedback: Reflexes are fast, involuntary responses to changes in the environment. These responses do not require conscious

4. What happens when an action potential is produced with a signal that is stronger than threshold?

- A. stronger action potential generated B. action potential has same strength as threshold
C. weaker action potential generated D. no action potential generated

Feedback: The minimum stimulus to cause an action potential, or impulse, to be produced is called threshold. A stronger stimulus does not generate a stronger action potential قوة السيل العصبي لا تتأثر بقوة المؤثر بعد عتبة التنبيه

5. What would be the hypothetical result if a person lacked motor neurons?

- A. would be unable to feel a deep cut B. would be unable to breath
C. would be unable to feel a hot plate D. would be unable to swing hammer

Feedback: Motor neurons carry nerve signals from the brain to the muscles and glands of the body. These neurons enable the voluntary movement of muscles for performing actions الخلايا العصبية الحركية تتحكم في الحركات الإرادية والاستجابة وفي حال تضررها لا يتمكن الشخص من الوظائف الحركية

11	BIO.3.1.01.059 Describe the basic structure and functions of the cells and main organs of the nervous system		194
	BIO.3.1.01.059 يصف التركيب والوظائف الأساسية للخلايا والأعضاء الرئيسية في الجهاز العصبي		
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The **cerebrum** is the largest part of the brain and is divided into two halves called hemispheres.

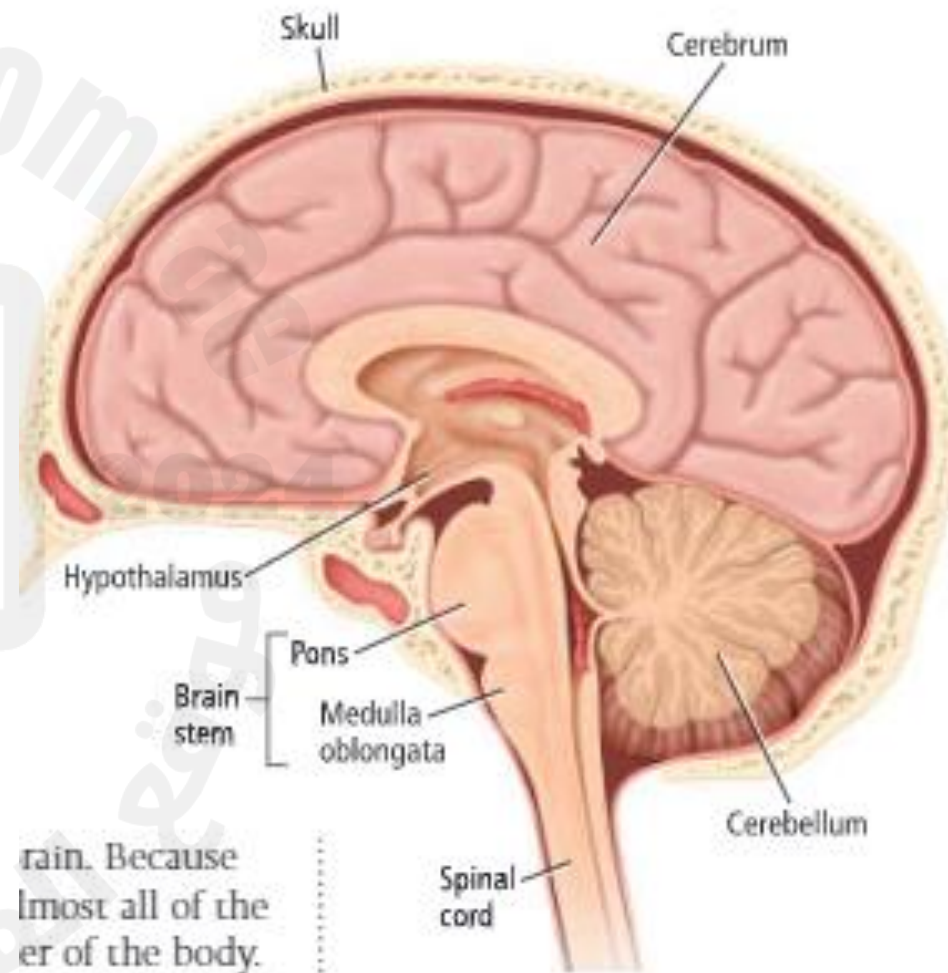
The **cerebrum** function:

learning, memory, language, speech, voluntary body movements, and sensory perception.

The **cerebellum** controls balance, posture, and coordination, and is located at the back of the brain.

The **cerebellum** is responsible for the smooth and coordinated movement of skeletal muscles and is also involved with motor skills, such as playing the piano or riding a bike

The brain stem connects the brain to the spinal cord and is made up of two regions called the medulla oblongata and the pons.



The **medulla oblongata** relays signals between the brain and the spinal cord.

Function: control breathing rate, heart rate, and blood pressure.

The medulla oblongata contains the interneurons responsible for the swallowing, gagging, vomiting, coughing, and sneezing reflexes.

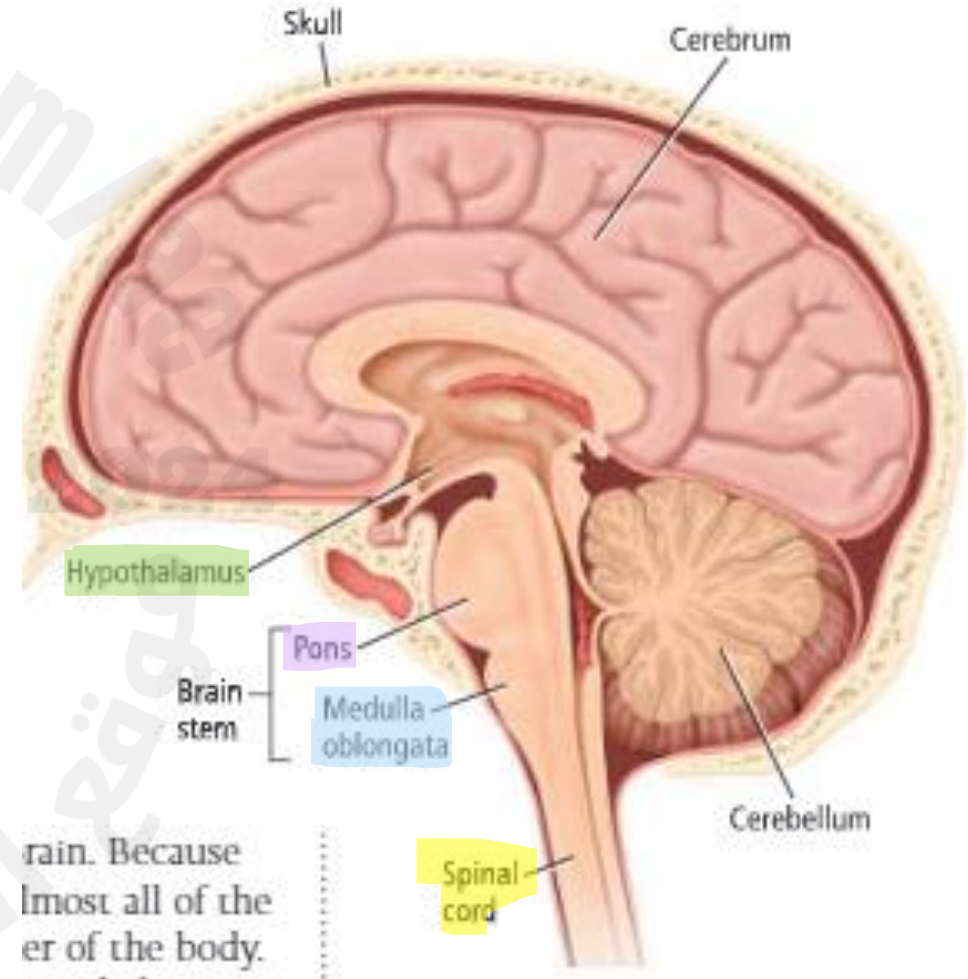
The **pons** relays signals between the cerebrum and the cerebellum

Function: The pons also helps control the rate of breathing.

The **hypothalamus** regulates body temperature, thirst, appetite, and water balance.

Function: It also partially regulates blood pressure, sleep, aggression, fear, and sexual behaviour.

The **spinal cord** is a nerve column that extends from the brain to the lower back.



11	BIO.3.1.01.059 Describe the basic structure and functions of the cells and main organs of the nervous system		194
	BIO.3.1.01.059 يصف التركيب والوظائف الأساسية للخلايا والأعضاء الرئيسة في الجهاز العصبي		
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a nerve is a bundle of both sensory and motor neurons , so we say that human nerve is like two ways street , because information move to and from brain through these sensory and motor neurons.

The Peripheral Nervous System

When you hear the word *nerve*, you might initially think of a neuron. However, a nerve is a bundle of axons. Many nerves contain both sensory and motor neurons. For example, there are 12 cranial nerves that lead to and from the brain and 31 spinal nerves (and their branches) that lead to and from the spinal cord, as shown in Figure 10. You could think of nerves as two-way streets. Information travels to and from the brain through these sensory and motor neurons.

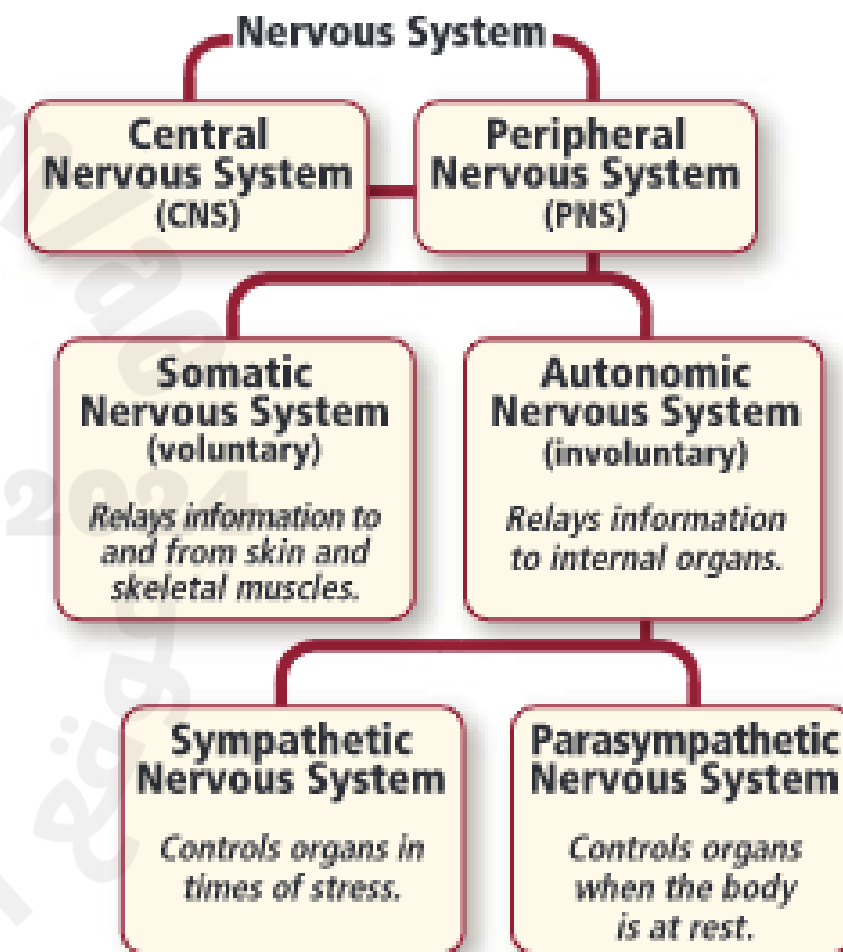


Reading Check Review the functions of the CNS.

all the functions of brain parts and spinal cord

■ **Figure 11** Each division of the nervous system functions in the control of the body and the communication within the body.

Table 1		
The Autonomic Nervous System		
emergency or stress		
body is relaxed		
Structure	Sympathetic Stimulation	Parasympathetic Stimulation
Iris (eye muscle)	Pupil dilation	Pupil constriction
Salivary Glands	Saliva production reduced	Saliva production increased
Oral/Nasal Mucosa	Mucus production reduced	Mucus production increased
Heart	Heart rate and force increased	Heart rate and force decreased
Lung	Bronchial muscle relaxed	Bronchial muscle contracted
Stomach	Muscle contractions reduced	Gastric juice secreted; motility increased
Small Intestine	Muscle contractions reduced	Digestion increased
Large Intestine	Muscle contractions reduced	Secretions and motility increased



For each set of terms below, choose the one term that does not belong and explain why it does not belong.

9. somatic system, parasympathetic system, sympathetic system both are divisions of autonomic n.s
10. cerebrum, pons, medulla oblongata not part of brain stem
11. autonomic nervous system, somatic nervous system, central nervous system both are divisions of peripheral n.s
12. Which is characteristic of the sympathetic division of the autonomic system?
- A. stimulates digestion
 - B. dilates the bronchi
 - C. slows the heart rate
 - D. converts glucose to glycogen

Use the diagram below to answer question 13.



13. If the portion indicated by the arrow was damaged as a result of trauma, what effect would this person most likely experience?
- A. partial or complete memory loss
 - B. body temperature fluctuations
 - C. trouble maintaining balance
 - D. rapid breathing
14. Which nervous system is the hypothalamus most involved in regulating?
- A. voluntary
 - B. peripheral
 - C. sensory
 - D. autonomic

It transmits signals between the brain and spinal cord. ينقل الإشارات بين الدماغ والحبل الشوكي

Learning Outcomes Covered

- 3-1-1-2
- 3-1-1-4

a. المخ
Cerebrum

b. المخيخ
Cerebellum

c. النخاع المستطيل
Medulla Oblongata

d. القنطرة
Pons

Which is characteristic of the sympathetic division of the autonomic system؟

Learning Outcomes Covered

- 3-1-1-2

a. يحفز الهضم
stimulates digestion

b. يوسع الشعب الهوائية
dilates the bronchi

c. يبطئ سرعة ضربات القلب
slows the heart rate

d. يحول الجلوكوز إلى جلايكوجين
converts glucose to glycogen

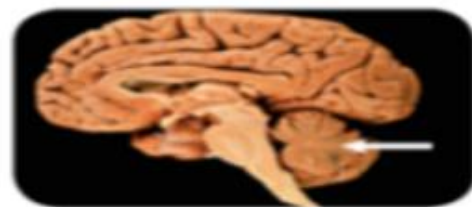
وظيفة تحت المهاد function of hypothalamus

- ☐ ينظم معدل التنفس وضربات القلب وضغط الدم
- ☒ ينظم درجة حرارة الجسم والعطش والشهية وتوازن الماء ✓
- ☐ ينقل الإشارات بين المخ والمخيخ
- ☐ الذاكرة واللغة والذاكرة الحركية والجسم الإرادية

وظيفة النخاع المستطيل function of medulla oblongata

- ☒ ينظم معدل التنفس وضربات القلب وضغط الدم ✓
- ☐ ينظم درجة حرارة الجسم والعطش والشهية وتوازن الماء
- ☐ ينقل الإشارات بين المخ والمخيخ
- ☐ الذاكرة واللغة والذاكرة الحركية والجسم الإرادية

إذا تعرض الجزء المشار إليه بالسهم للتلف نتيجة لصدمة ، فما هو التأثير الأرجح علي هذا الشخص ؟



. If the portion indicated by the arrow was damaged as a result of trauma, what effect would this person most likely experience?

- ☐ partial or complete memory loss فقدان الذاكرة جزئيا أو كليا
- ☐ body temperature fluctuations تقلبات درجة حرارة الجسم
- ☒ trouble maintaining balance مشاكل في التوازن ✓
- ☐ rapid breathing سرعة التنفس

Which nervous system is the hypothalamus most involved in regulating? ما الجهاز العصبي الذي يضم التنظيم بواسطة تحت المهاد

- ☐ voluntary الارادي
- ☐ peripheral الطرفي
- ☐ sensory الحسي
- ☒ autonomic الذاتي ✓

يتكون الجاز العصبي peripheral nervous system consist of الطرفي من

- ☐ spinal cord + nerves الحبل الشوكي والأعصاب
- ☐ brain + sensory neurons الدماغ والخلايا الحسية
- ☒ sensory and motor neurons الخلايا العصبية الحسية والحركية ✓
- ☐ interneurons الخلايا العصبية البينية

وظائف الحبل الشوكي function of spinal cord

- ☒ reflex arc القوس الانعكاسي ✓
- ☒ connect the body with brain ربط الجسم بالدماغ ✓
- ☐ regulate balance التوازن
- ☐ thinking and solve problems التفكير وحل المشكلات
- ☐ 100 billions of cells يحتوي 100 مليار خلية

خصائص الدماغ characteristics of the brain

- ☐ reflex arc القوس الانعكاسي
- ☐ connect the body with brain ربط الجسم بالدماغ
- ☒ regulate balance التوازن ✓

5 How do impulses move at a synapse?

A by an electrical charge

B by a chemical neurotransmitter

C by touching the next neuron

D by osmosis

6 Which would play a major role in making plans for choosing a career?

A Central nervous system, because it analyzes and stores information.

B Central nervous system, because it control reflexes.

C Peripheral nervous system, because it relays information to skeletal muscles.

D Peripheral nervous system, because it responds involuntarily

7 Which structure would be most active if you were in a hot, dry desert without water?

A medulla oblongata

B pons

C cerebrum

D hypothalamus

8-What is true about reflexes?

A They travel to the brain on sensory neurons.

B They travel to the brain on motor neurons.

C They are controlled voluntarily.

D They are processed in the spinal cord and not in the brain

9 Fluid found in which structure of the inner ear stimulates hair cells in response to sound?

A semicircular canals

B cochlea

C oval window

D ear canal

10- Ears are adapted to respond to which form of energy?

A vibrations

B light

C chemical

D heat

4- In which do impulses move fastest?

A-neurons that carry dull pain

B- myelinated neurons

C- nonmyelinated neurons

2.10: Which is the gap between the axon of one neuron and the dendrite of a second neuron?
الذي يمثل الفجوة بين المحور العصبي لخلية عصبية والزوائد الشجرية لخلية عصبية أخرى؟

a. النبض العصبي
nerve impulse

b. العقدة
node

c. القوس الانعكاسي
reflex arc

d. التشابك العصبي
synapse

BIO.3.1.03.049 يجمع ويلخص المعلومات ليدعم الرأي القائل بأن المستقبلات الحسية تستجيب للمنبهات عن طريق إرسال رسائل إلى الدماغ للقيام بالسلوك الفوري أو لتخزينها كذاكريات

Figure 11

Sense	Sense organ	Stimulus	Receptor	Mechanism of sensation
taste	tongue	chemical	Taste buds	Stimulus---taste buds-----sensory nerve----- brain---- motor neuron----- response
smell	nose	chemical	Olfactory receptors	Stimulus---- olfactory receptors---- olfactory nerve--- - brain----- motor neuron---- response
Sight	eyes	light	Rods and cones in retina	Lowlight---- rods -----optical nerve----- brain----- response High light ---- cones
touch	skin	Heat Pain Pressure Light touch	Heat receptors Pressure receptors Pain receptors Light touch receptors	Physical stimulus----- sensory receptor---- sensory nerve--- Brian ----- motor neuron----- response.
Hear	Ear (cochlea)	sound	Hair cells in cochlea	Sound---- tympanum---- tiny bones in middle ear---- oval window---- cochlea---- hair cells ---- auditory nerve--- brain--- response
balance	Ear (semicircular canals)	Movement of the body	Hair cells in semicircular canal	Movement---- hair cell in semicircular canal---- sensory nerve--- brain---- response

Q.6: Which eye structure provides information about colors to the brain ما تركيب العين الذي يقدم المعلومات المتعلقة بالألوان للمخ؟

Learning Outcomes Covered

◦ 3-1-1-4

a.

cones

الخلايا المخروطية

b.

retina

شبكة العين

c.

lens

العدسة

d.

rods

الخلايا العصوية

Activate
Go to Plan

The inner ear also contains organs for balance, including three semicircular canals.

Semicircular canals transmit information about body position and balance to the brain.

The **three canals** are positioned at right angles to one another, and they are fluid-filled and lined with hair cells.

When the position of your head changes, the fluid in the semicircular canals moves.

This causes the hair cells to bend, which in turn sends nerve impulses to the brain. The brain then is able to determine your position and whether your body is still or in motion

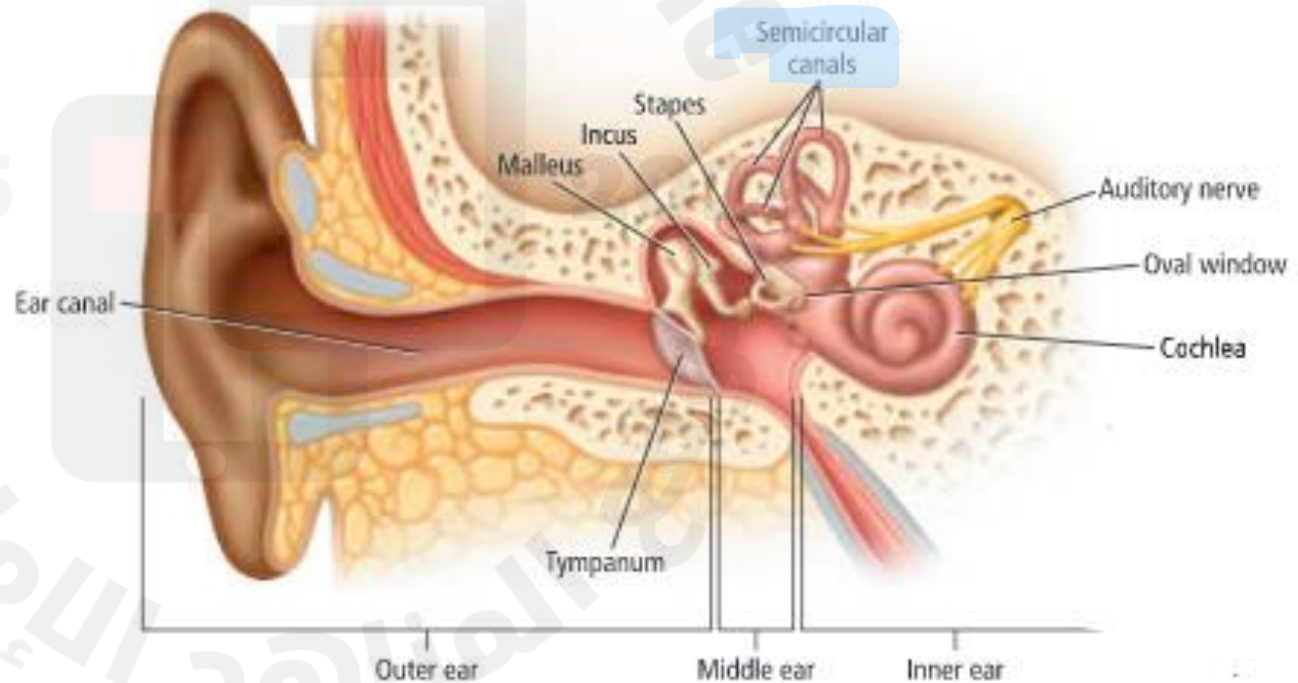
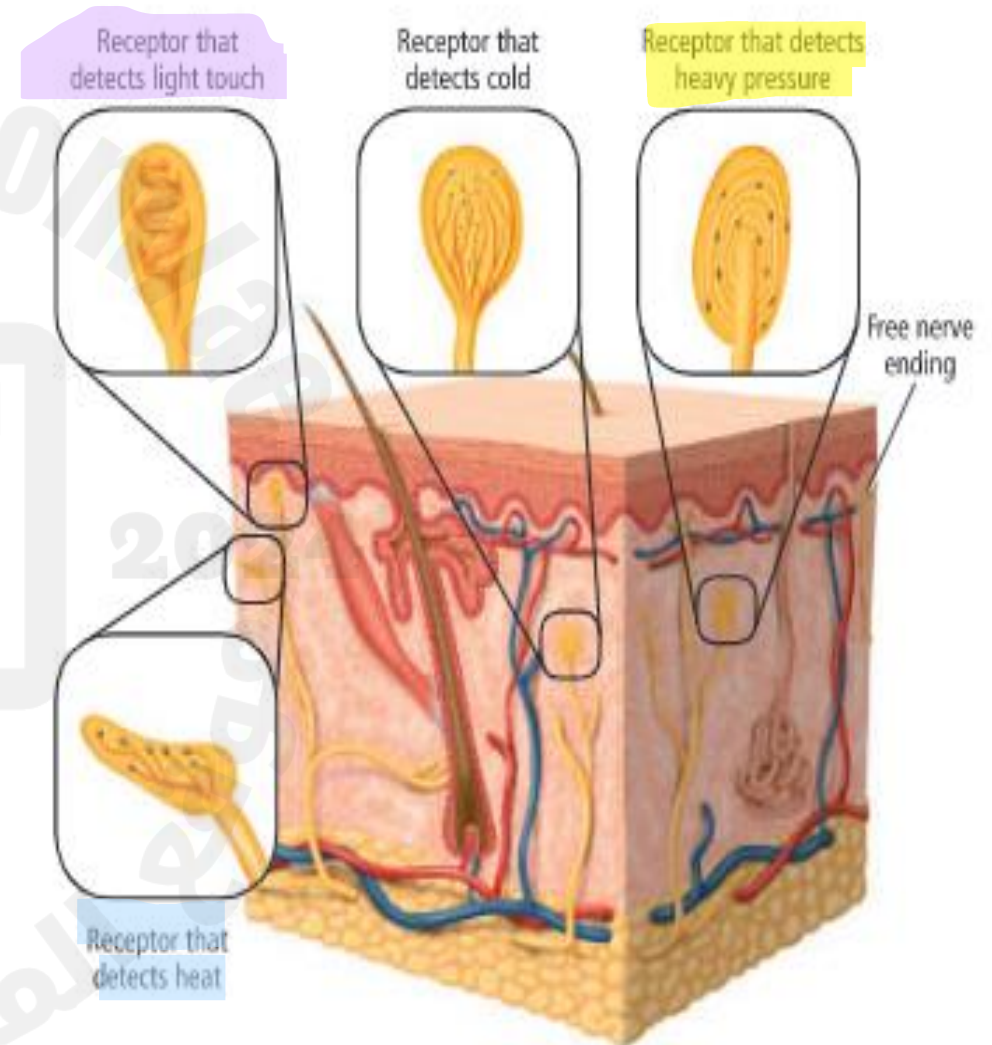


Figure 15 Many types of receptors are found in the skin. A person can tell if an object is hot or cold, sharp or smooth.

The tips of the fingers have many receptors that detect **light touch**

The soles of the feet have many receptors that respond to **heavy pressure**.

Pain receptors are simple, consisting of free nerve endings that are found in all tissues of the body except the brain.



Distinguish between the terms in each of the following sets.

18. rods, cones rods low light level
 cones highlight and colors response

19. cochlea, semicircular canals cochlea for hearing
 semicircular canals for balance

20. retina, taste buds
vision structure where comes and found
taste receptors for taste buds

Understand Main Ideas

21. If there was a power outage in a movie theater and only a few dim emergency lights were lit, which cells of the retina would be most important for seeing your way to the exit?

- A. rods
- B. cones
- C. Rods and cones are equally important.

22. Which represents the correct sequence as sound waves travel in the ear to trigger an impulse?

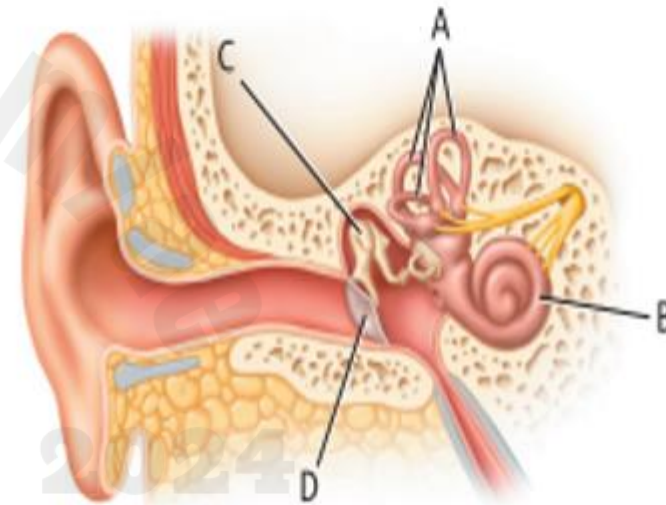
- A. cochlea, incus, stape, eardrum
- B. tympanum, bones in the middle ear, cochlea, hair cells
- C. auditory canal, tympanum, hair cells, cochlea
- D. hair cells, auditory canal, cochlea, malleus

26. Ex
all
ab
alv
or
27

23. With which sense are free nerve endings associated?

- A. taste
- B. hearing
- C. touch
- D. sight

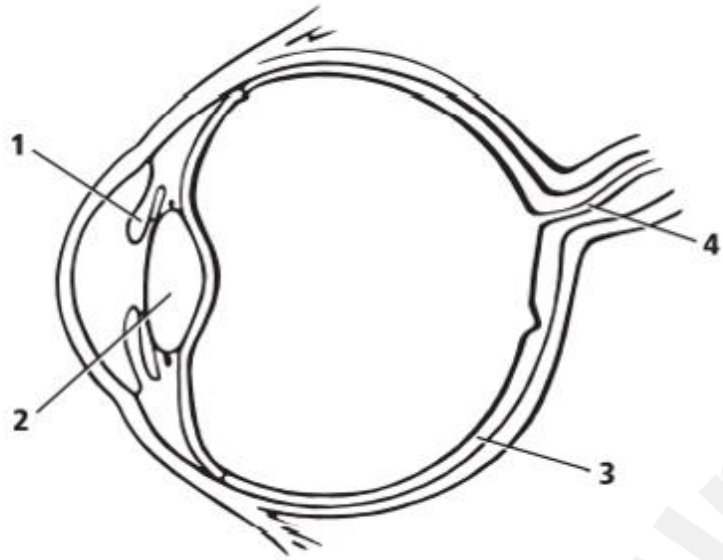
Use the diagram below to answer question 24.



24. Some rides at amusement parks cause a person to become dizzy when the ride stops. Which structure in the diagram is most likely involved with the dizzy feeling?

- A. A
- B. B
- C. C
- D. D

Use the diagram below to answer questions 6 and 7.

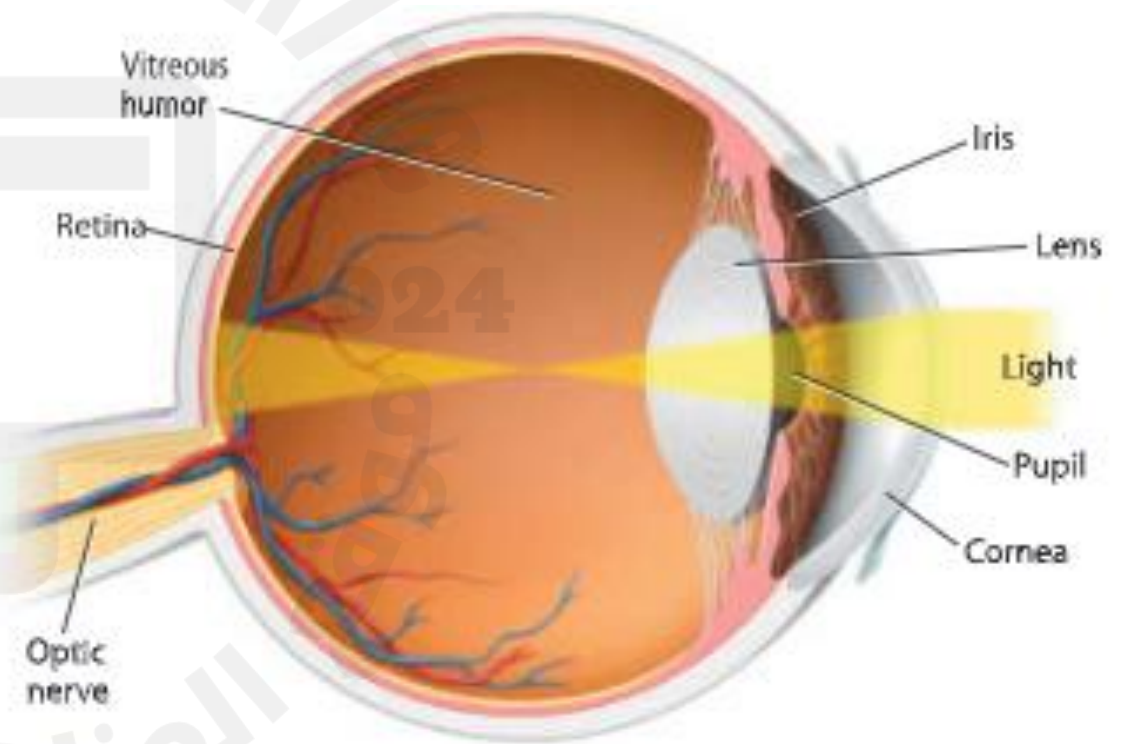


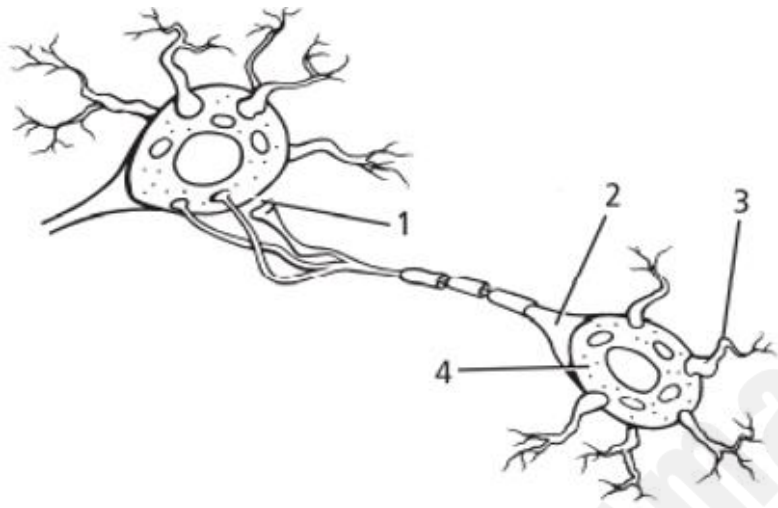
6. Which part of the eye is made of muscles that respond to stimuli?

- A. 1 iris
- B. 2
- C. 3
- D. 4

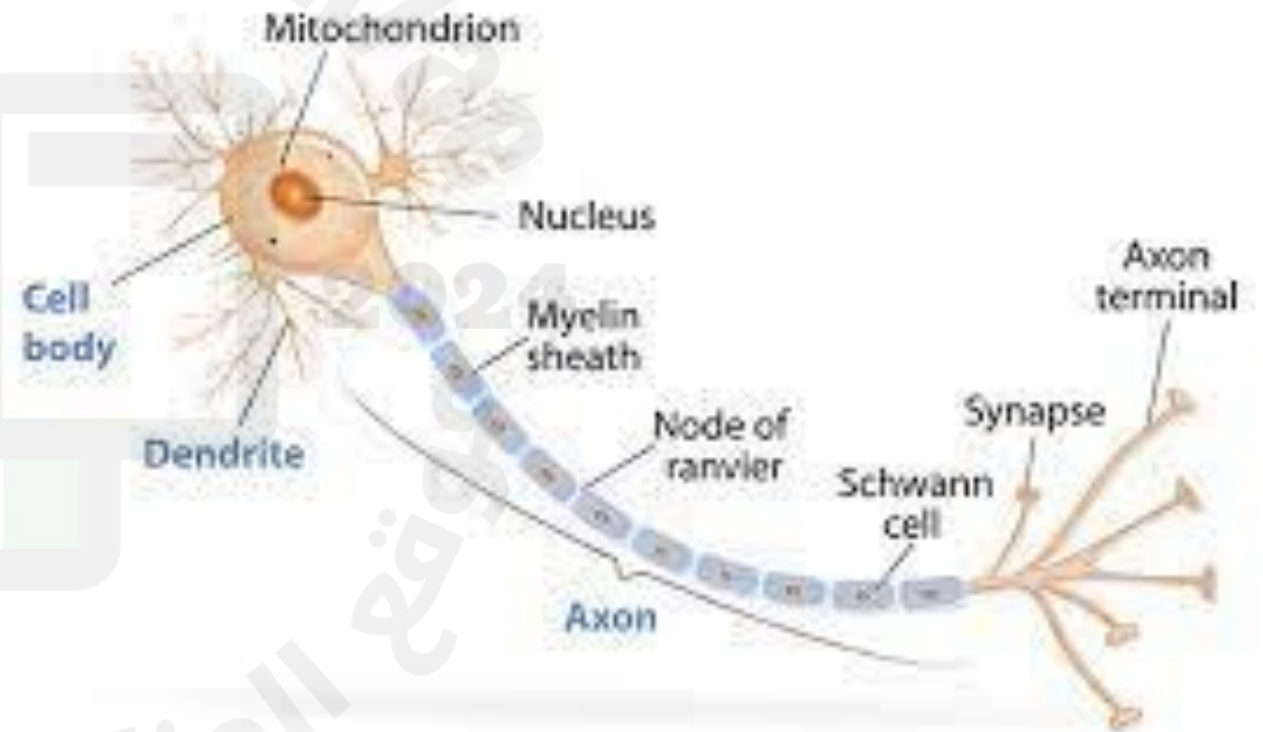
7. If a person cannot see certain colors, what part of the eye might be damaged?

- A. 1
- B. 2
- C. 3 retina
- D. 4



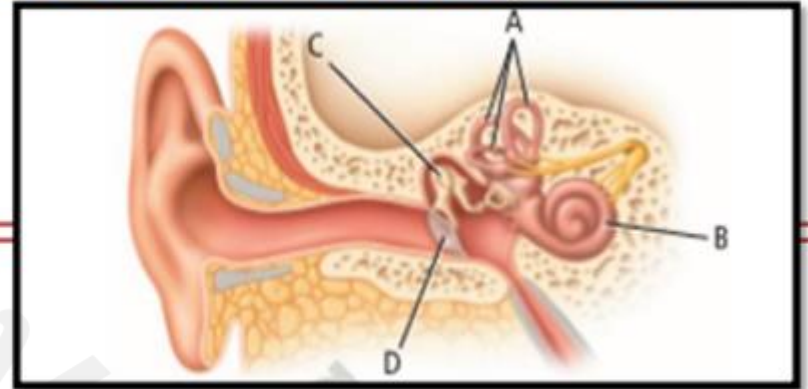


2. In which part of the diagram above would you expect to find myelin?
- A. 1
B. 2 axon
 C. 3
 D. 4
3. In which part of the diagram above would you expect to find neurotransmitters when an action potential reaches the end of the neuron?
- A. 1 axon ending**
 B. 2
 C. 3
 D. 4



Some rides at amusement parks cause a person to become dizzy when the ride stops. Which structure in the diagram is most likely involved with the dizzy feeling?

A. A C. C B. B



مسؤول عن السمع ؟What synthesis is responsible for hearing in the ear

A. A B-B C.C D.D

التسلسل الصحيح نَقَال الموجات Which represents the correct sequence as soundwaves travel in the ear to trigger an impulse؟ الصوتية في اذن لتحفز نبضة؟

القناة السمعية طبلة اذن ، عظام اذن الوسطى ، قوقعة اذن ، auditory canal, tympanum, bones in the middle ear, cochlea, hair cells الخلايا الشعرية

- القوقعة ، السندان ، العقبة ، طبلة اذن cochlea, incus, stape, eardrum
- القناة السمعية ، طبلة اذن ، الخلايا الشعرية ، القوقعة auditory canal, tympanum, hair cells, cochlea

What is the function of capillary cells ؟ 1. ما وظيفة الخلايا الشعرية ؟

important for hearing and balance

important for balance

important to hear

important for vision

If there was a power outage in a movie theater and only a few dim emergency lights were lit, which cells of the retina would be most important for seeing your way to the exit? إذا كان هناك انقطاع للتيار الكهربائي في دار سينما ولم يء عدد قليل من أضواء الطوارئ الخافتة ، فما خيا شبكية العين ستكون أكثر أهمية لرؤية طريقك إلى المخرج؟

rods العصوية

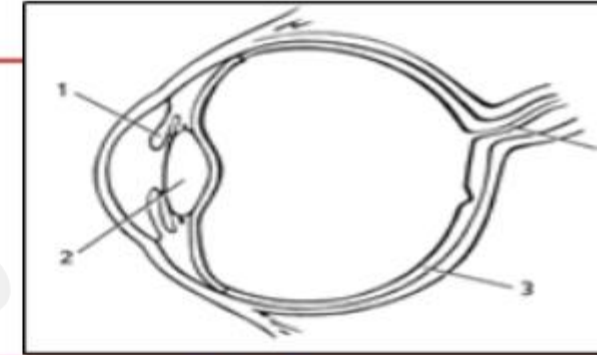
cones المخروطية

Rods and cones are equally important كلاهما نفس الأهمية

-function in bright light and provide information about color to the brain (Cones)

-light-sensitive cells that are excited by low levels of light rods

-behind the iris, which inverts the image and projects in onto the retina 2 lens



Q.10: ما الحاسة التي ترتبط بها النهايات العصبية الحرة؟ With which sense are free nerve endings associated

A. Taste التذوق

C. Touch اللمس

B. hearing السمع

D. sight الرؤية

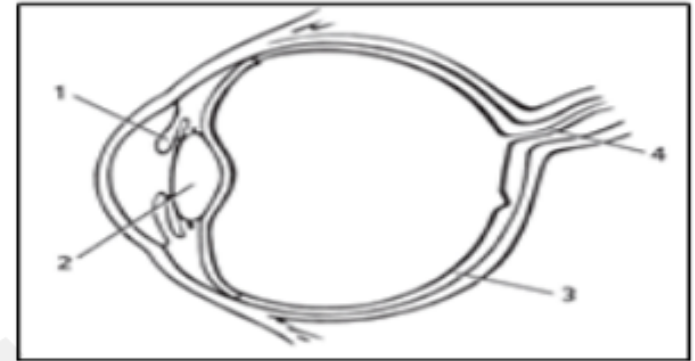
Feedback: Many types of sensory receptors that respond to temperature, pressure, and pain are found in the epidermis and dermis layers of the skin

6-areas of specialized chemical receptors on the tongue that detect the tastes of sweet, sour, salty, and bitter taste bud

r

Q.2: إذا لم يستطع أحد الأشخاص رؤية لون معين، فما الجزء المتضرر من عينه؟
If a person cannot see certain colors, what part of the eye might be damaged

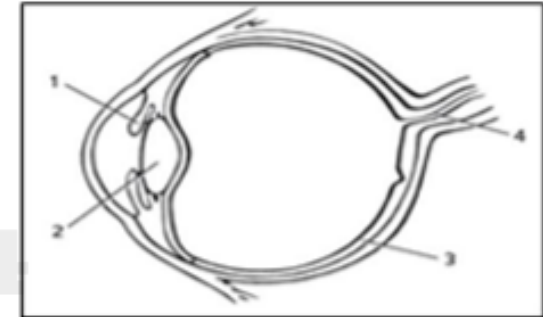
- A-1
- B-2
- C-3
- D-4



What determines the size of the pupil in the eye؟
ما الذي يحدد حجم البؤبؤ في العين؟

A-1(iris muscle)

- B-2
- C-3
- D-4



Q.4: Which eye structure provides information about colors to the brain؟
ما تركيب العين الذي يقدم المعلومات المتعلقة بالألوان للمخ؟

A-retina الشبكية

B-cones خلايا مخروطية

C-rods خلايا عصوية

D-lens العدسة

Which part of the eye does light enter first? (cornea)

WHICH OF THE following are the chemical receptors ? اي مما يلي مستقبل كيميائي

☒ Taste buds براعم التذوق ✓

☐ eye العين

☒ olfactory cells الخلايا الشمية ✓

☐ ear الأذن

☐ skin الجلد

types of receptors are found in the skin انواع المستقبلات في الجلد

☐ photoreceptors ضوئية

☒ heat receptors مستقبلات حرارة ✓

☐ mechanical receptors ميكانيكية

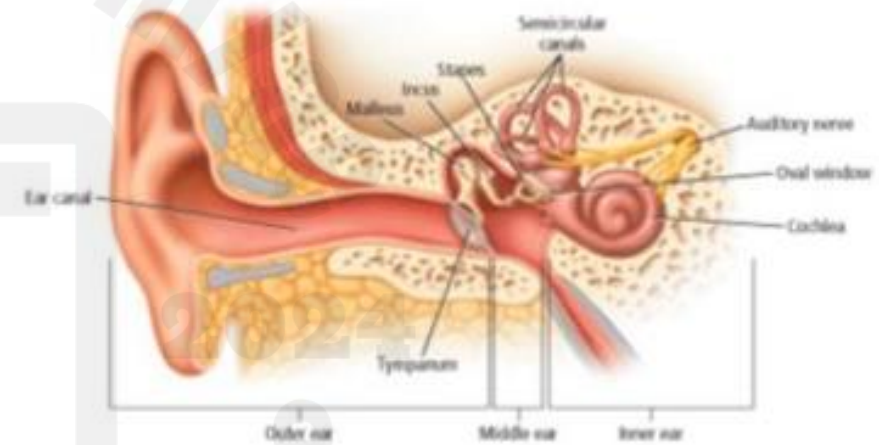
☒ cold receptors مستقبلات البرد ✓

☒ pressure receptors مستقبلات الضغط ✓

☐ chemical receptors مستقبلات كيميائية

☒ light touch مستقبلات اللمس ✓

6. Look at this illustration of the human ear's internal structure. Which part of the ear receives vibrations from the eardrum?



- A. ☐ oval window
B. ☒ stapes
C. ☐ cochlea
D. ☐ semicircular canals

Q.8: With which sense are free nerve endings associated ما الحاسة التي ترتبط بها النهايات العصبية الحرة؟

Learning Outcomes Covered

◦ 3-1-1-4

a. التذوق
taste

b. اللمس
touch

c. السمع
hearing

d. الإبصار
sight

A **drug** is a substance, natural or artificial, that alters the function of the body.

- A drug can cause an increase in the amount of a neurotransmitter that is released into a synapse.
- A drug can block a receptor site on a dendrite, preventing a neurotransmitter from binding
- A drug can prevent a neurotransmitter from leaving a synapse.
- A drug can imitate a neurotransmitter.

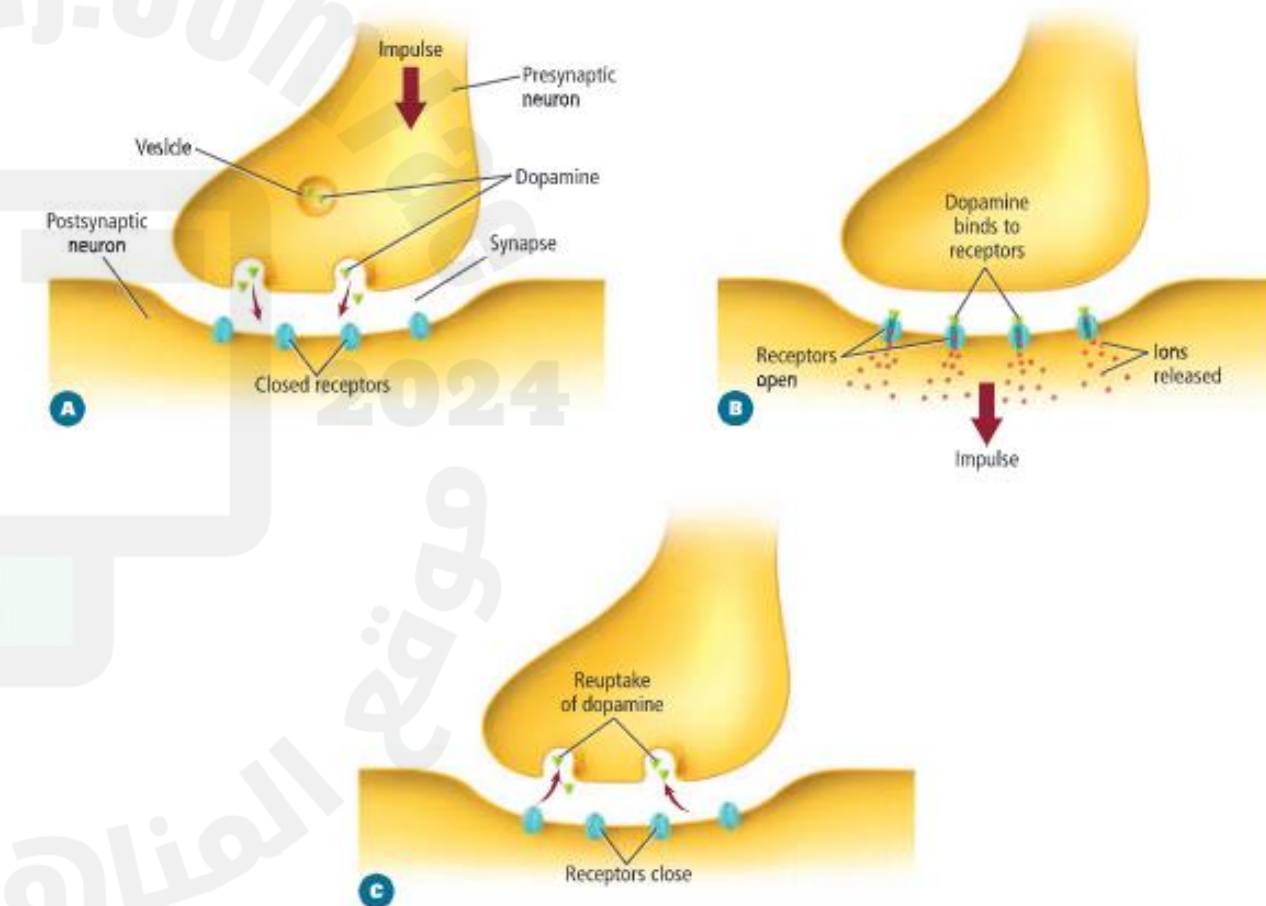
Table 2		Some Common Drugs	
Caffeine		Prescription Drugs	Over-the-Counter Drugs
			
coffee, tea, soda, chocolate		antibiotics, pain medications	aspirin, cold medications

Many drugs that affect the nervous system influence the level of a neurotransmitter called **dopamine**.

Dopamine is a neurotransmitter found in the brain that is involved with the control of body movements and other functions.

Dopamine also is strongly involved with feelings of pleasure or reward.

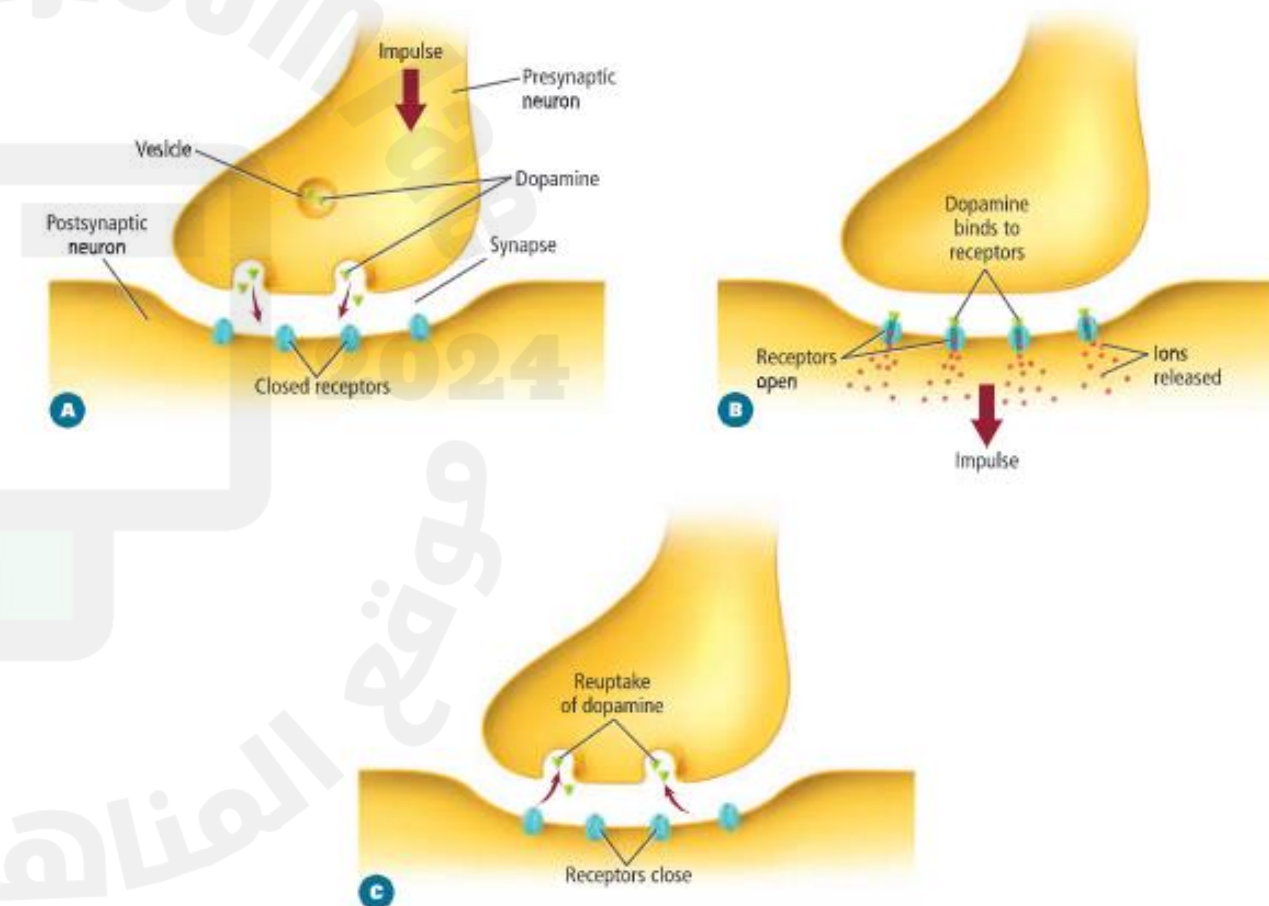
Dopamine normally is **removed** from a synapse by being reabsorbed by the neuron that released it



1- Dopamine crosses the gap from one neuron and binds to receiver sites, or receptors, on the membrane of another neuron.

2- Dopamine transmit the impulse from one neuron to the next neuron.

3- Dopamine normally is removed from a synapse by being reabsorbed by the neuron that released it.



15	BIO.3.1.01.046 Recognize the influence of alcohol and drugs on the efficiency of the reproductive system, nervous system and physical equilibrium	الشكل 16	202
	BIO.3.1.01.046 يتعرف تأثير الكحول والمخدرات على الكفاءة للجهاز التناسلي والالتزان الجسمي والجهاز العصبي	Figure 16	
16	BIO.3.1.01.046 Recognize the influence of alcohol and drugs on the efficiency of the reproductive system, nervous system and physical equilibrium		203
	BIO.3.1.01.046 يتعرف تأثير الكحول والمخدرات على الكفاءة للجهاز التناسلي والالتزان الجسمي والجهاز العصبي		

Drugs that increase alertness and physical activity are **stimulants**.

Nicotine in cigarette and cigar smoke increases the amount of dopamine released into a synapse.
constricts : blood vessels, raising blood pressure and causing the heart to work harder than normal.



Caffeine works by binding to adenosine receptors on neurons in the brain.

Found in : coffee, tea, some soft drinks, and even some foods such as chocolate.

Adenosine slows down neural activity, causing drowsiness.
When caffeine binds to these receptors, it has the opposite effect.
It makes users **feel awake and alert**.



يقيد = constricts

Drugs that tend to slow down the central nervous system are **depressants**.

- Depressants can lower blood pressure, interrupt breathing, and slow the heart rate.
- Depressants can relieve anxiety, but they also can cause the noticeable sedation of effect.

Alcohol is a depressant. It affects the central nervous system and is one of the most widely abused drugs in the world today.

Short-term alcohol use impairs judgment, coordination, and reaction time.

Long-term effects of alcohol abuse include a reduction in brain mass, liver damage, stomach and intestinal ulcers, and high blood pressure.

Consumption of alcohol during pregnancy is the cause of fatal alcohol syndrome, which can result in damage to a baby's brain and nervous system.



Inhalants are chemical fumes that have an influence on the nervous system

+ Exposure to inhalants might be accidental as a result of poor ventilation

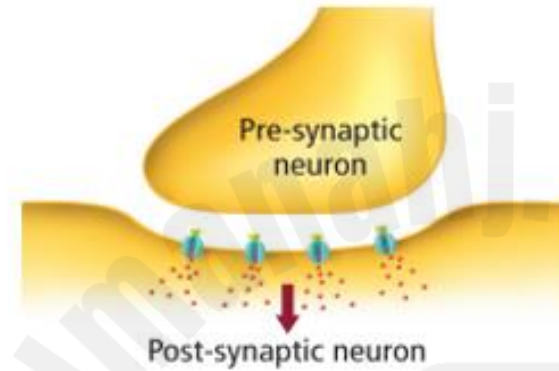
They work by acting as a depressant on the central nervous system.

Inhalants might produce a short-term effect of intoxication, as well as nausea and vomiting.

Long-term exposure to inhalants can cause memory loss, hearing loss, vision problems, peripheral nerve damage, and brain damage.



Use the diagram below to answer question 31.



31. If a person is suffering from depression, which drug is one recommended treatment of the presynaptic neuron?
- A. one that increases the reuptake of dopamine
 - B. one that increases the production of dopamine
 - C. one that decreases the receptors for dopamine
 - D. one that decreases the reuptake of dopamine

A type of inhibitor that causes damage to the liver, intestines and high blood pressure and harms the fetus when taken by the mother

Learning Outcomes Covered

o 3-1-1-6

a. الكافيين
Caffeine

b. النيكوتين
Nicotine

c. الكحول
Alcohol

وجه المقارنة	Tolerance التحمل	Addiction الإدمان
وجه الاختلاف	احتاج الشخص إلى العقار نفسه للوصول إلى التأثير المطلوب	الاعتماد النفسي والسيولوجي على العقار (التحمل يؤدي للإدمان)
.tolerance, addiction(Tolerance is adapting to a certain level of a drug in the body . Addiction is becoming psychologically and/or physically dependent on a drug		

5. Chemical fumes that influence the nervous system are called ____.

A. inhalants

المستنشقات

B. stimulants

C. neurotransmitters

D. dendrites

Feedback: Inhalants are chemical fumes that can affect the central nervous system. They generally act as a depressant, and can cause death or brain damage

. How is the chemical dopamine involved in drug addiction?

A. drugs cause reabsorption of dopamine in neuron

B. drugs deplete dopamine levels in brain

C. addicts who quit experience dopamine increases

D. drugs increase dopamine levels in brain

Feedback: Drugs prevent the natural reabsorption of dopamine in the neuron. This causes a build-up of dopamine, producing a pleasurable effect. When addicts attempt to quit drugs, dopamine levels are depleted.

. The psychological and/or physiological dependence on a drug is called ____.

A. stimulation

B. Tolerance

C. addiction

D. treatment

Drugs that tend to slow down the central nervous system are called ____.

A. Depressants

B. Stimulants

C. Inhalants

D. caffeine

4. Alcohol is an example of what type of drug?

A. Stimulant

B. Depressant

مثبطات

20. Which of these would not be a factor in drug addiction?

A. decreased dopamine level after quitting

B. tolerance to a depressant

C. normal dopamine level maintained during drug use

D. increased dopamine level due to a drug

Q.2: ؟ والتوتر من ضربات القلب والتوتر في الماريجوانا تزيد من ضربات القلب والتوتر ؟
The active substance in marijuana

increases heart rate and stress

Learning Outcomes Covered

o 3-1-1-5

a. المنبهات
stimulants

b. المتبطات
inhibitors

c. المستنشقات
inhalers

d. THC


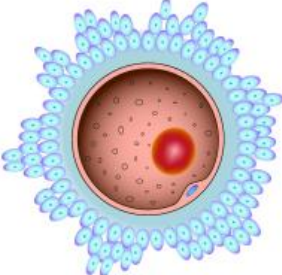
20. Which of these would not be a factor in drug addiction?

- A. decreased dopamine level after quitting B. tolerance to a depressant
C. normal dopamine level maintained during drug use D. increased dopamine level due to a drug

Feedback: Drug addiction often involves a change in dopamine levels in the brain. Drugs can cause dopamine levels to increase by preventing its reabsorption in the neuron. This results in a decrease in dopamine levels when the drug is discontinued, which encourages addiction

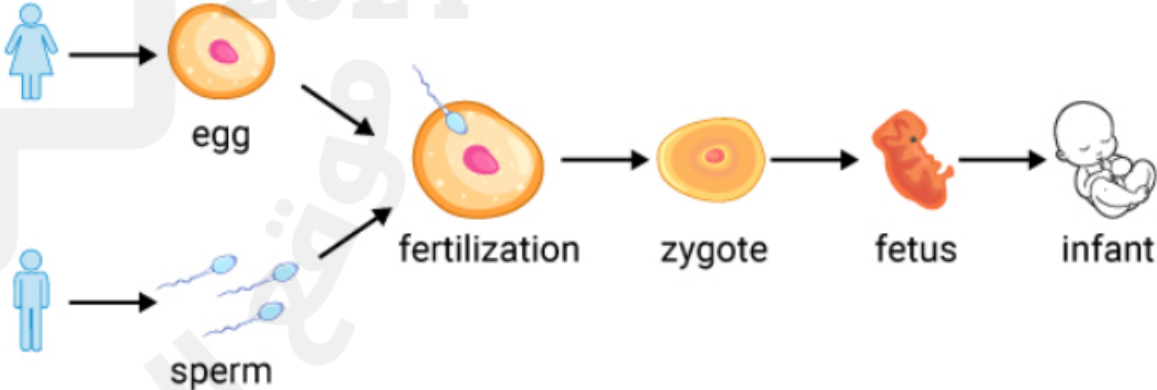
What are the reproductive cells?

 Explore

A sperm is the male reproductive cell.	An egg is the female reproductive cell.
	

The processes of the reproductive systems involve:

- the union of an egg and a sperm cell
- the development of the fetus
- the birth of an infant

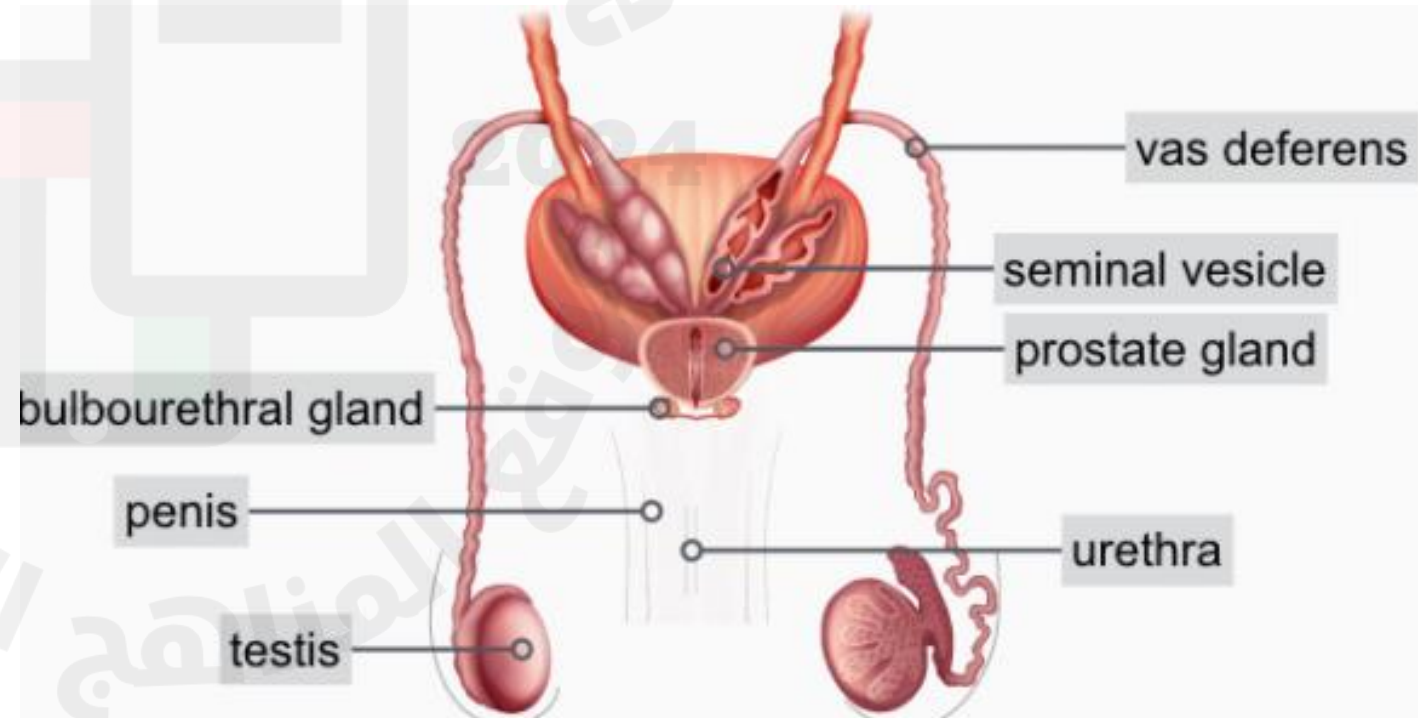


The Male Reproductive System :

The male has reproductive organs that are both inside and outside his body.

The male reproductive system contains:

- the testes (singular testis)
- the ducts: epididymis and vas deferens
- the accessory glands: seminal vesicles, prostate gland, and bulbourethral glands
- the penis



Testes

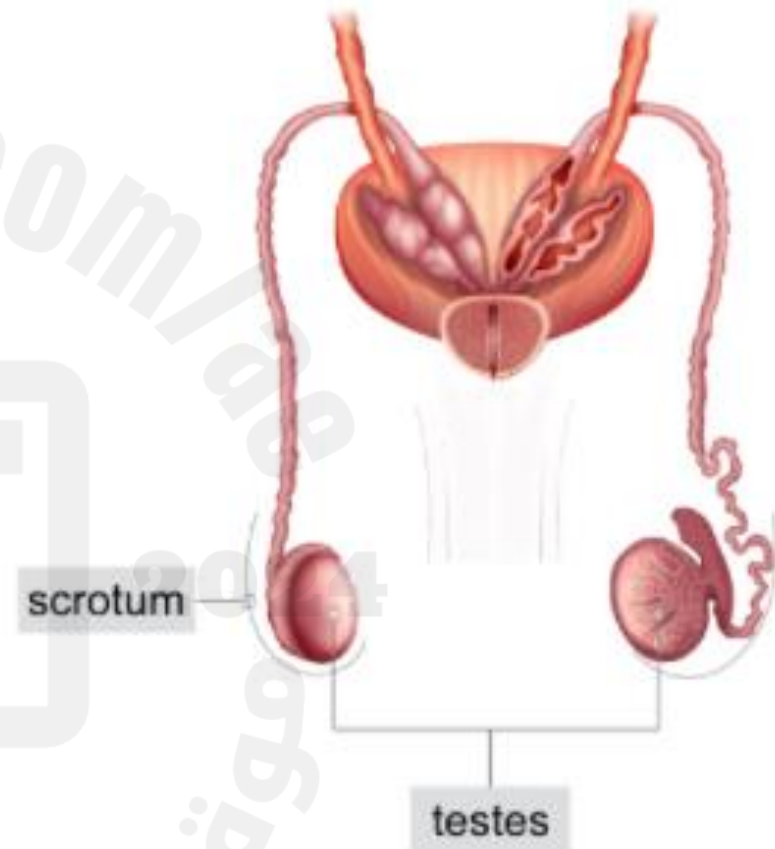
- Testes (singular testis): also called testicles
- are the male reproductive glands
- are located outside the body in a pouch-like structure called the scrotum

Functions: production of sperm cells, 100-200 million sperm are produced each day

- production of male hormones (testosterone)

Why are the testes located outside the male's body??

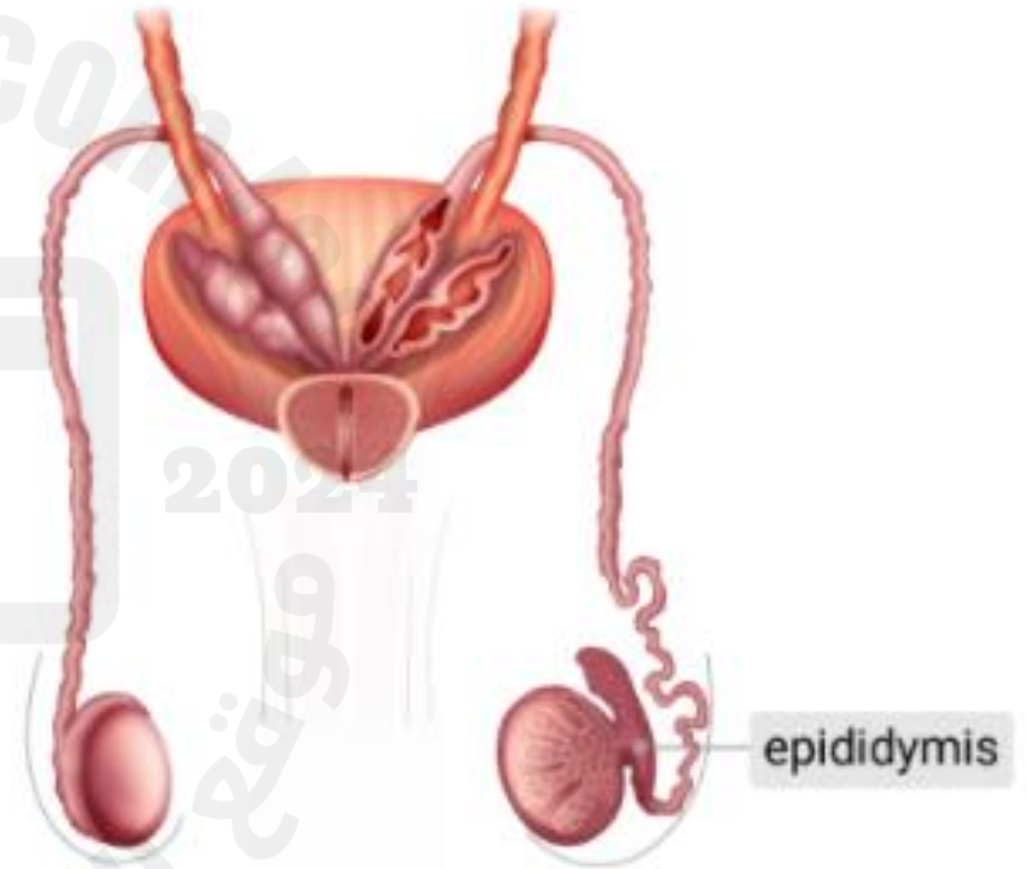
The temperature of testes should be kept cooler than the normal body temperature, 37°C, which is crucial for the production of sperm cells.



Epididymis

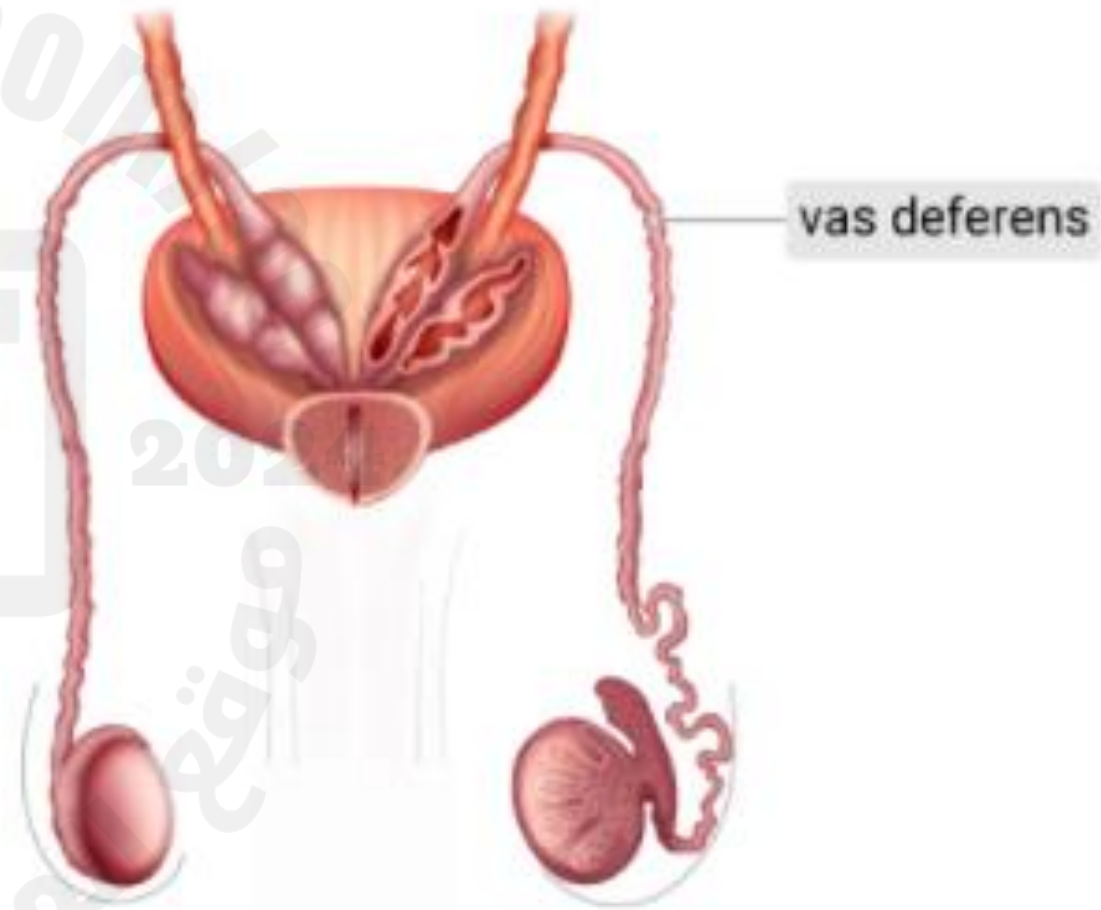
Epididymis: are coiled structures located on top of each testis

Functions: site of sperm maturation and storage



Vas deferens

Vas deferens: are a pair of ducts leading from the testes to the seminal vesicles

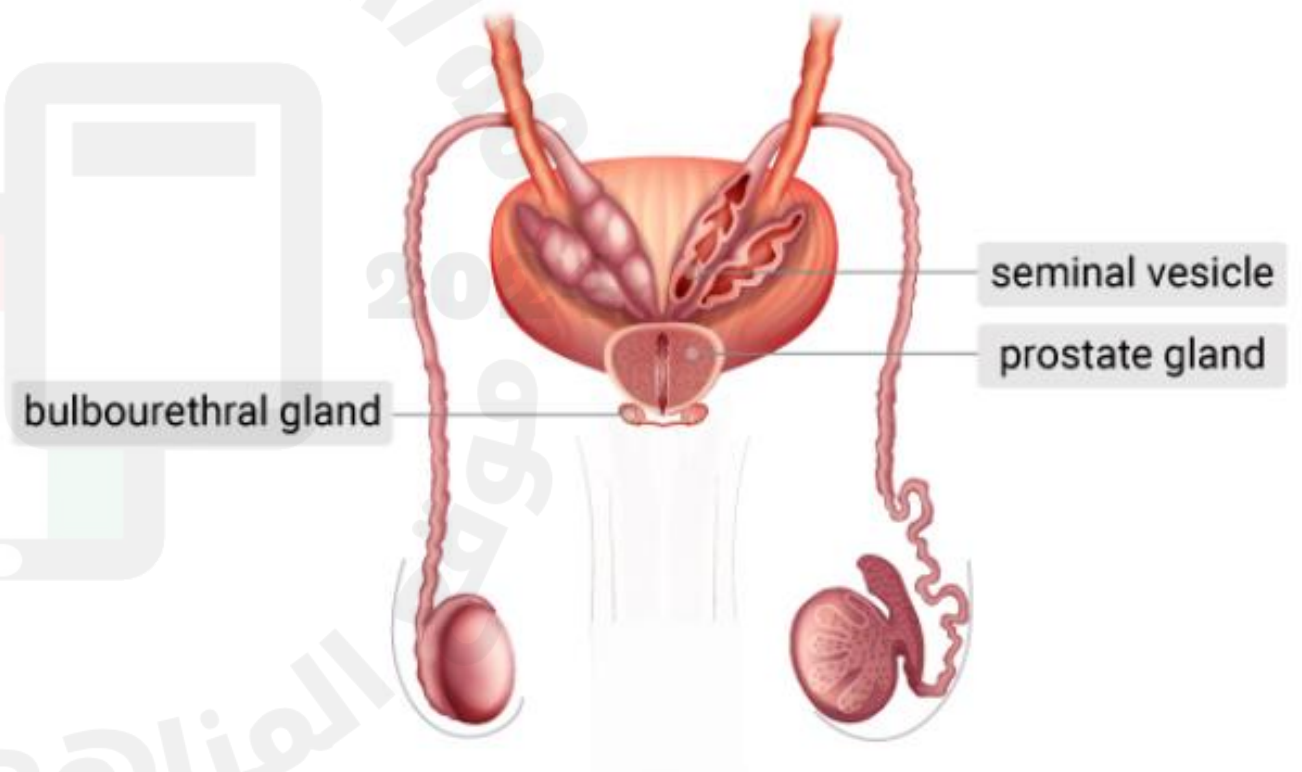


glands

The **male accessory glands** include the:

- seminal vesicles
- prostate gland
- bulbourethral glands

Function: secrete fluids essential for the movement, nourishment, and protection of the sperm.



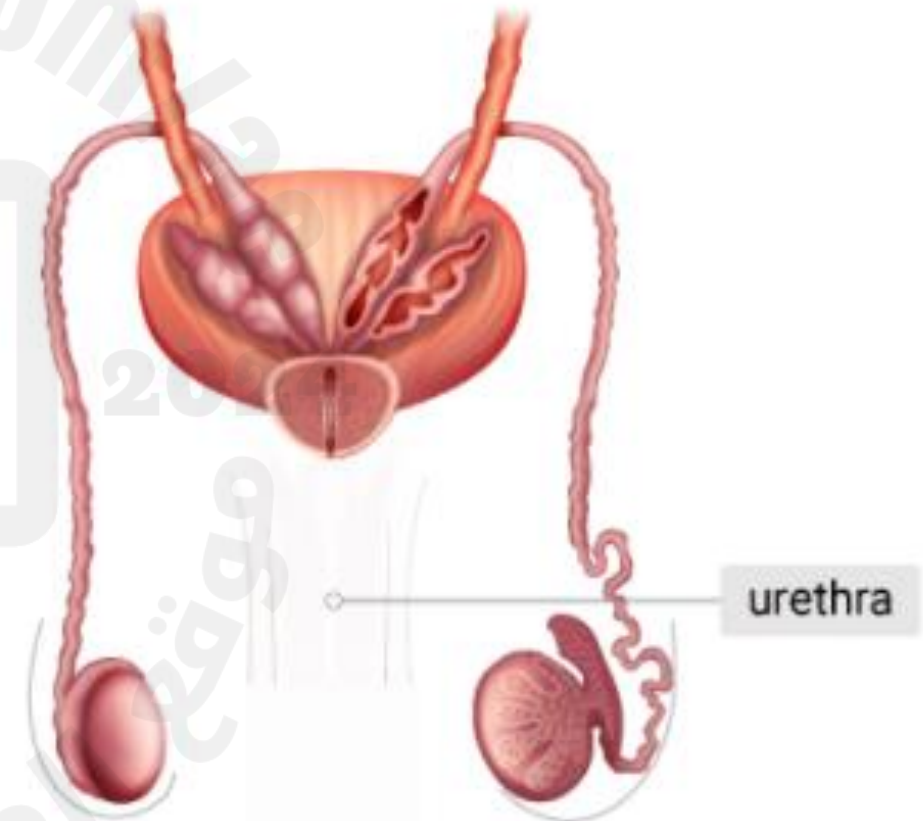
Urethra

Urethra: is a tube inside the penis

Functions: carries both semen and urine outside the male's body through the penis

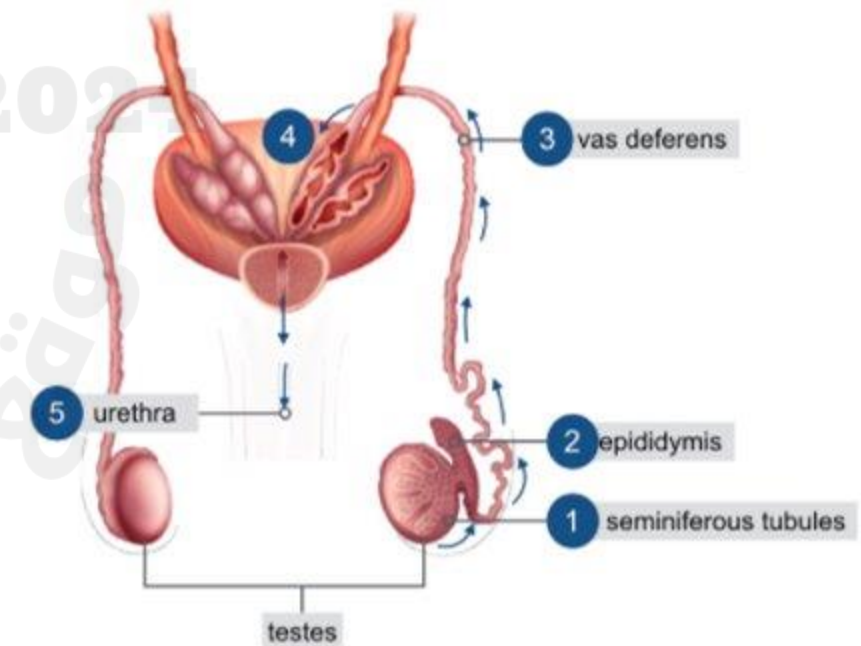
Semen:

During their passage through the male reproductive system, sperm cells mix with fluids produced by the accessory glands. The mixture of sperm cells and these fluids is called **semen**. Semen is a slightly alkaline mixture



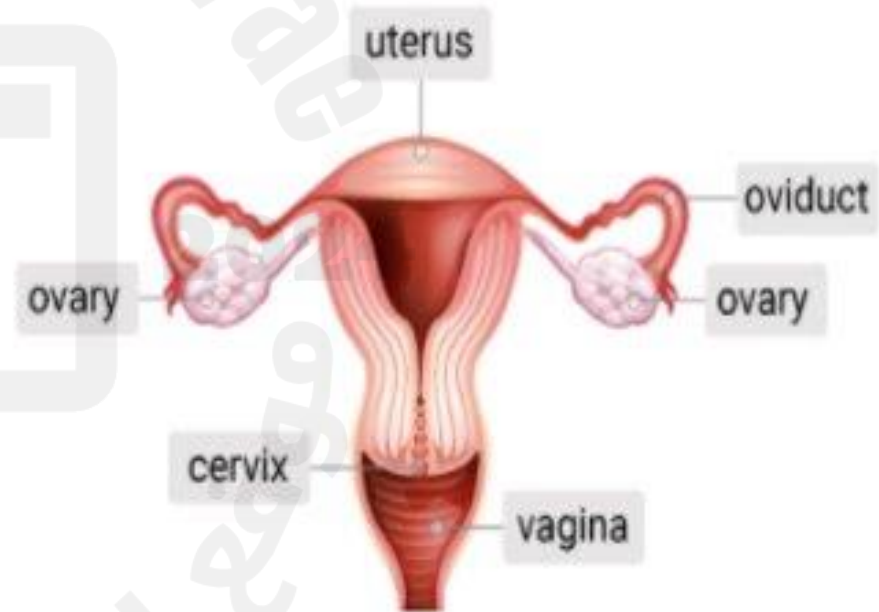
The Pathway of Sperm

1. Sperm develop in the seminiferous tubules in the testes.
2. Sperm travel to the epididymis.
3. The sperm then move to the vas deferens.
4. The seminal vesicles, prostate gland, and bulbourethral glands secrete a fluid that mixes with sperm and forms semen.
5. Semen is carried out of the body through the urethra



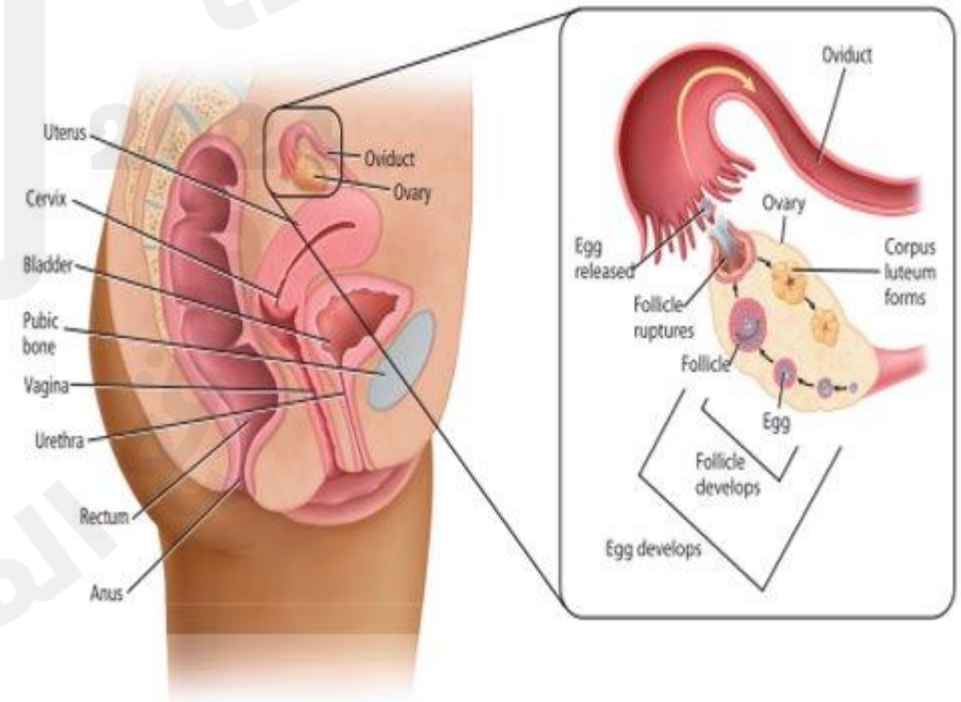
The female reproductive organs includes:

- oviducts
- ovaries
- uterus
- cervix
- vagina



The functions of the female reproductive system includes:

- producing egg cells.
- receiving sperm cells.
- providing an environment for fertilization and the development of a baby.



Ovaries:

- are the female reproductive glands.
- are oval structures, about the size and shape of an almond.

Functions:

- production and release of immature egg cells, called oocytes, into the female reproductive tract.
- production of female hormones.

Oviducts:

- tubes that connect to the uterus.

Functions:

- collect and move the egg that is released from the ovary.

Uterus:

- also called the womb.
- has the size of an average human fist

Function:

- supports the development and growth of a baby



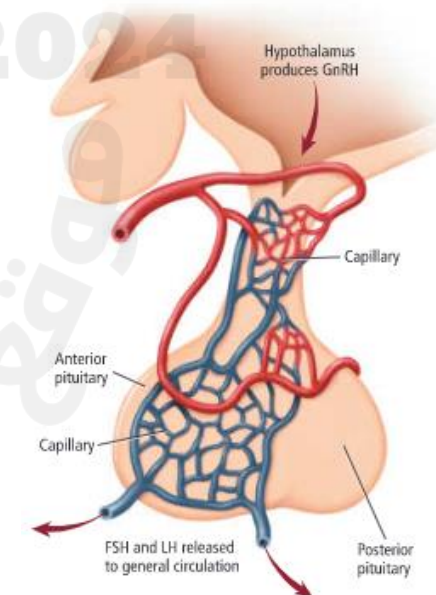
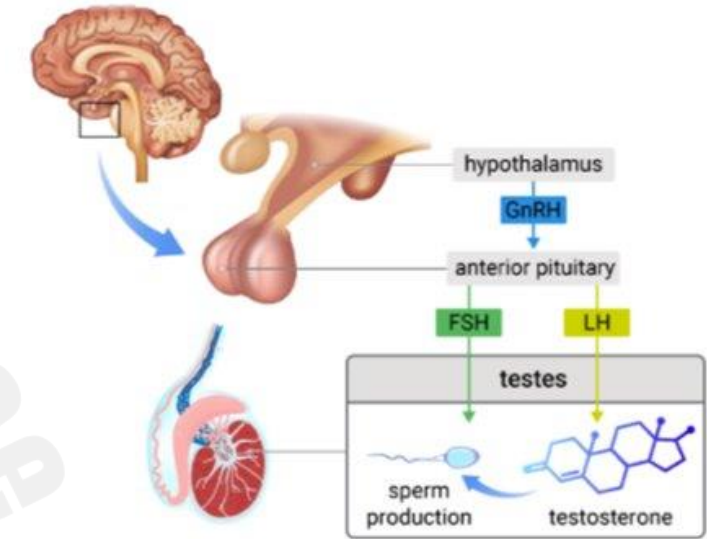
During puberty in **males**:

1. The hypothalamus secretes gonadotropin-releasing hormone (GnRH), which triggers the pituitary gland to secrete hormones that target the testes.
2. The anterior pituitary secretes luteinizing hormone (LH) and follicle-stimulating hormone (FSH).
3. LH stimulates the production and secretion of testosterone.
4. FSH promotes the production of sperm.
5. Testosterone is necessary for the production of sperm and the development of secondary sex characteristics at puberty

The levels of the male hormones are regulated by a negative feedback mechanism.

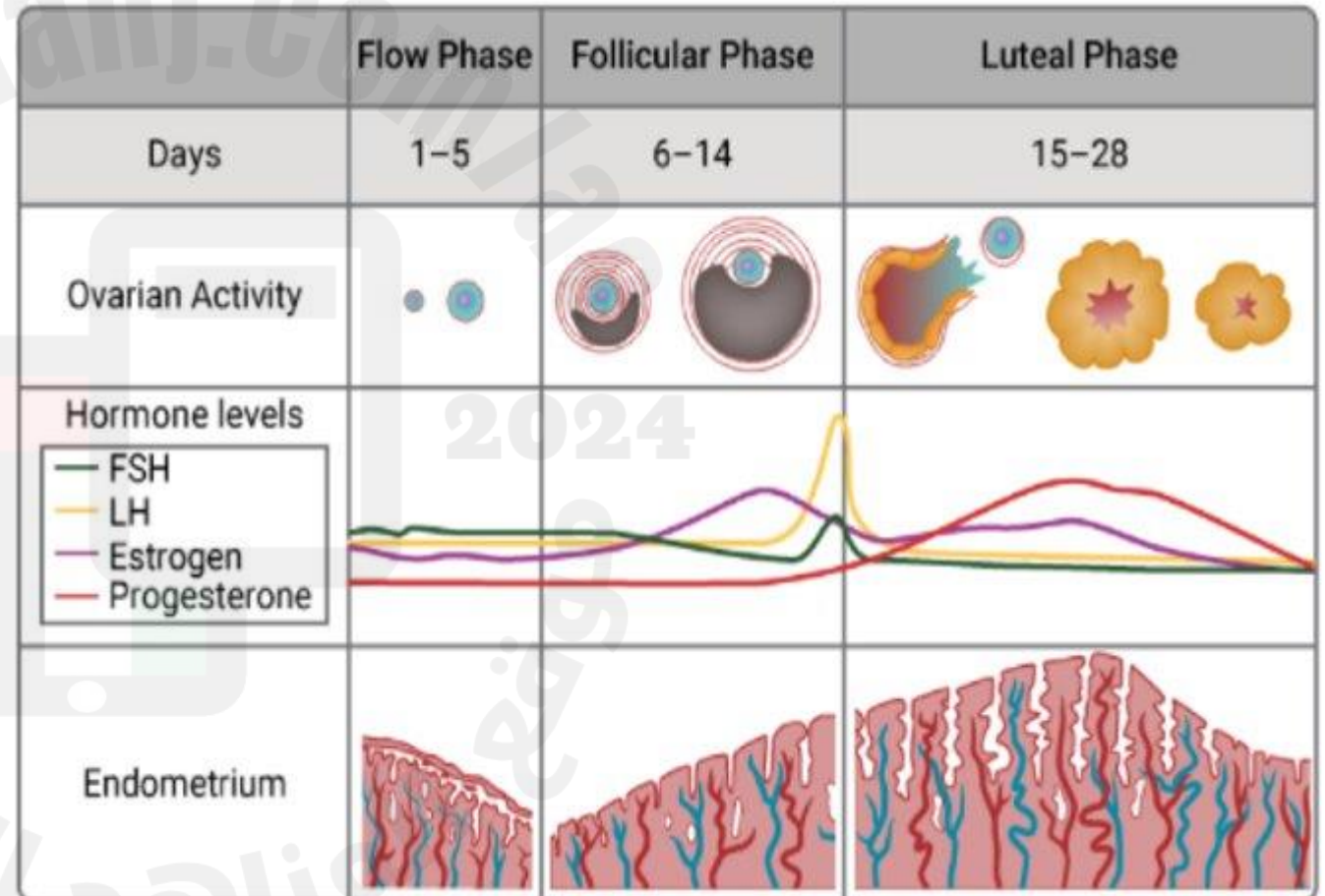
Explain.

Testosterone has a negative feedback effect on the hypothalamus and the pituitary gland to reduce the secretions of GnRH, LH, and FSH



The menstrual cycle is divided into **three phases**:

- the flow phase
- the follicular phase
- the luteal phase



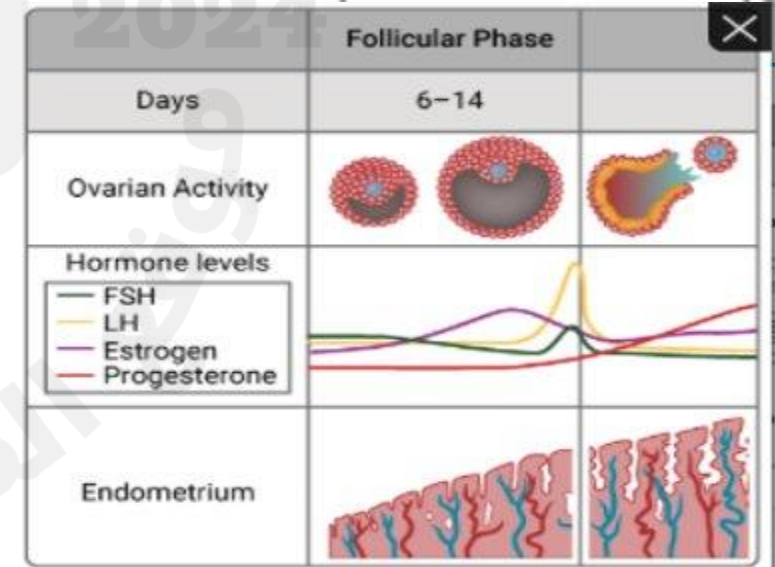
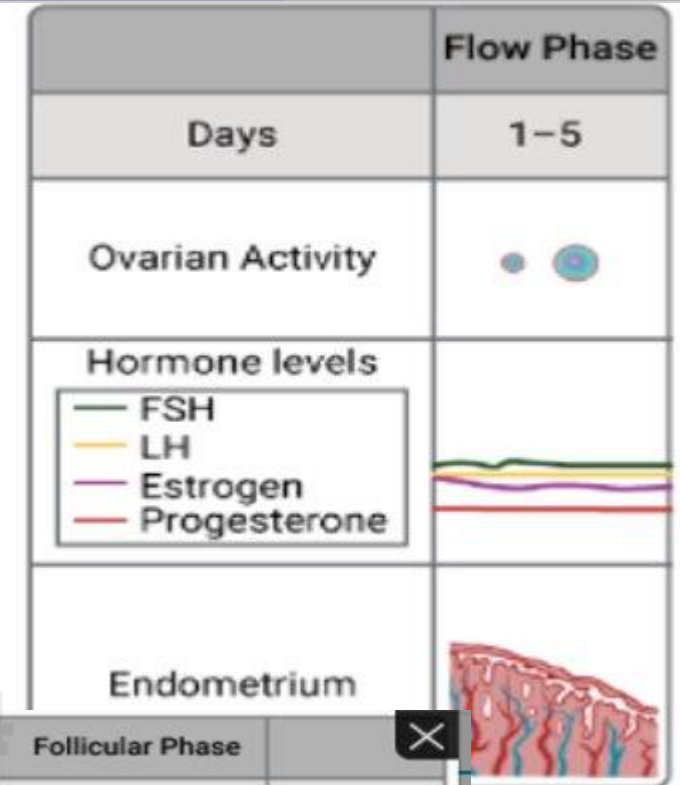
The **flow phase** begins on the **first day** of menstrual flow and lasts until the **5th day of the cycle**.

What causes menstrual flow?

- At the beginning of the menstrual cycle, low estrogen and progesterone levels cause the shedding of blood vessels and cells from the endometrium.
- Bleeding occurs because the soft tissue and blood vessels are ruptured

During the **follicular phase**:

- FSH is secreted from the anterior pituitary and stimulates the growth of the follicles.
- One follicle grows and produces estrogen which inhibits FSH secretion by negative feedback and prevents the rest of follicles from growing.
- Estrogen acts on the uterus to stimulate the thickening of the endometrium.

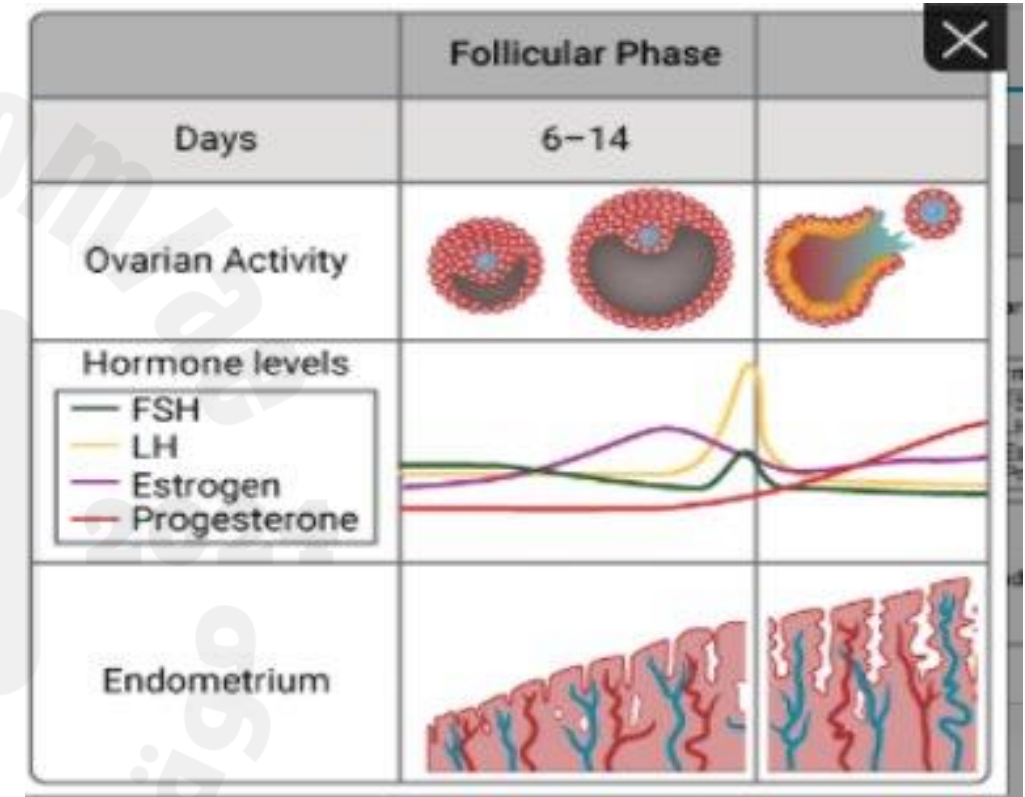


Ovulation

- On about day 12, estrogen stimulates the anterior pituitary to release a surge of LH.
- This causes the follicle to rupture and release the secondary oocyte. This is called ovulation

During the luteal phase:

- The ruptured follicle develops into a structure called corpus luteum.
- The corpus luteum secretes high levels of progesterone and some estrogen. This keeps the levels of FSH and LH low by negative feedback.
- The low levels of FSH and LH prevent any follicles from developing.
- If fertilization doesn't occur, the corpus luteum degenerates, and estrogen and progesterone levels drop.
- The drop in the levels of estrogen and progesterone causes the detachment of the endometrium and a new cycle begins



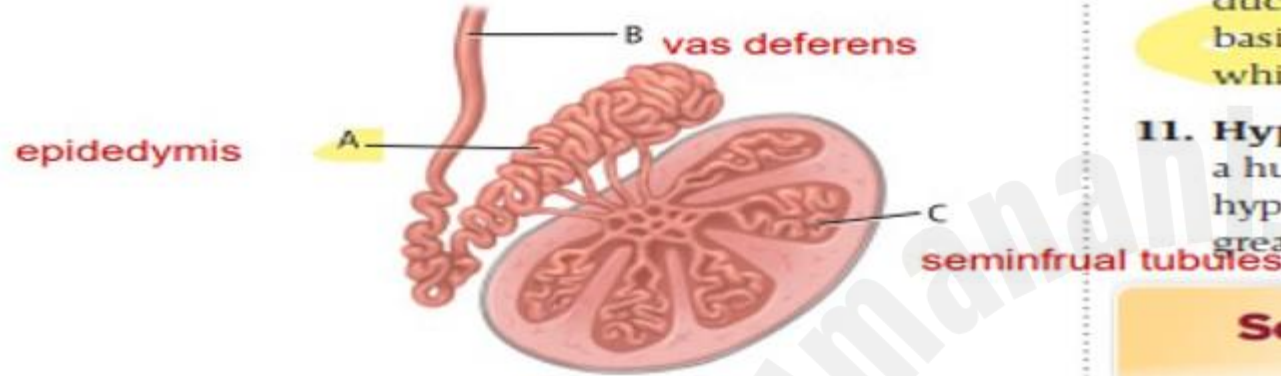
If the egg is fertilized, a different chain of events occurs, and a new menstrual cycle does not begin.

The progesterone levels remain high and increase the blood supply to the endometrium.

The corpus luteum does not degenerate and hormone levels do not drop.

The endometrium accumulates lipids and begins secreting a fluid rich in nutrients for the developing embryo.

Use the diagram below to answer questions 5 and 6.



5. What occurs in the structure labeled C in the illustration?
- A. sperm cell storage and maturation
 - B. sperm cell production
 - C. secretion of sugar
 - D. production of FSH
6. What is the function of the structure labeled A in the illustration?
- A. sperm cell storage and maturation
 - B. sperm cell production
 - C. secretion of sugar
 - D. production of FSH

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