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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 1

According to the Cockcroft and Gault formula, why must the estimated Glomerular Filtration Rate (GFR) be multiplied by 0.85 for female patients?

A. Women generally possess a lower muscle mass compared to men.

B. The female kidney has a lower density of nephrons than the male kidney.

C. Women have a naturally lower filtration fraction than men.

D. Estrogen levels inhibit the primary active transport of creatinine.

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 1

According to the Cockcroft and Gault formula, why must the estimated Glomerular Filtration Rate (GFR) be multiplied by 0.85 for female patients?

A. Women generally possess a lower muscle mass compared to men.

✓ إجابتك صحيحة

Creatinine production is proportional to muscle mass, which is typically lower in women, requiring a correction factor for accuracy.

B. The female kidney has a lower density of nephrons than the male kidney.

C. Women have a naturally lower filtration fraction than men.

D. Estrogen levels inhibit the primary active transport of creatinine.

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 2

In the context of renal handling, which substance has a clearance value (C_x) that is exactly equal to the Glomerular Filtration Rate (GFR)?

A. Creatinine

B. Para-aminohippuric acid (PAH)

C. Urea

D. Inulin

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 2

In the context of renal handling, which substance has a clearance value (C_x) that is exactly equal to the Glomerular Filtration Rate (GFR)?

A. Creatinine

✗ إجابتك غير صحيحة

Creatinine is partially secreted, which typically results in a clearance value slightly higher than the actual GFR.

B. Para-aminohippuric acid (PAH)

C. Urea

D. Inulin

✓ الإجابة الصحيحة

Inulin is neither reabsorbed nor secreted by the tubules, so the volume of plasma cleared of it equals the volume filtered.

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 3

How does bilateral renal stenosis contribute to the development of systemic hypertension according to the ?source material

A. The stenosis causes a direct mechanical obstruction that increases total peripheral resistance.

B. The kidneys increase renin-angiotensin formation as if there were systemic hypotension.

B. The kidneys increase renin-angiotensin formation as if there were systemic hypotension.

C. Chronic atherosclerosis causes the basement membrane to thicken, increasing the filtration fraction.

D. The kidneys fail to excrete ANP, leading to excessive sodium retention.

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Physiology Quiz

استنادًا إلى 3 مصادر

How does bilateral renal stenosis contribute to the development of systemic hypertension according to the ?source material

A. The stenosis causes a direct mechanical obstruction that increases total peripheral resistance.

✗ إجابتك غير صحيحة

While resistance increases at the site of stenosis, the systemic effect is driven by hormonal regulation ($RAAS$) triggered by the kidney.

B. The kidneys increase renin-angiotensin formation as if there were systemic hypotension.

✓ الإجابة الصحيحة

Impaired blood flow causes the kidneys to perceive low pressure and activate the $RAAS$ to compensate, raising systemic blood pressure.

C. Chronic atherosclerosis causes the basement membrane to thicken, increasing the filtration fraction.

D. The kidneys fail to excrete ANP, leading to excessive sodium retention.

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 4

True or False: The secondary active transport of glucose in the proximal convoluted tubule (PCT) is directly fueled by the hydrolysis of ATP at the luminal membrane.

A. False

B. True

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 4

True or False: The secondary active transport of glucose in the proximal convoluted tubule (PCT) is directly fueled by the hydrolysis of ATP at the luminal membrane.

A. False

✓ إجابتك صحيحة

Secondary active transport uses the energy from the sodium gradient established by the $Na^+ - K^+$ ATPase pump located on the basolateral membrane, not the luminal membrane.

B. True

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 5

Which of the following describes the effect of Angiotensin II on the peritubular capillaries to enhance sodium and water reabsorption?

A. It dilates afferent arterioles, increasing the peritubular capillary osmotic pressure.

B. It constricts efferent arterioles, reducing peritubular capillary hydrostatic pressure.

C. It inhibits the $Na^+ - H^+$ counter-transport in the PCT cells.

D. It decreases the filtration fraction, which lowers the colloid osmotic pressure in the capillaries.

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 5

Which of the following describes the effect of Angiotensin II on the peritubular capillaries to enhance sodium and water ?reabsorption

A. It dilates afferent arterioles, increasing the peritubular capillary osmotic .pressure

✗ إجابتك غير صحيحة

Angiotensin II typically acts on the efferent arteriole to modulate peritubular pressures .and increases the filtration fraction

B. It constricts efferent arterioles, reducing peritubular capillary .hydrostatic pressure

✓ الإجابة الصحيحة

Efferent constriction lowers the pressure downstream in the peritubular capillaries, favoring the movement of fluid into the .vessels

C. It inhibits the $Na^+ - H^+$ counter-transport in the PCT cells.

D. It decreases the filtration fraction, which lowers the colloid osmotic .pressure in the capillaries

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 6

What is the primary mechanism by which Phlorhizin interferes with glucose handling in the kidney?

A. It increases the tubular transport maximum (T_m) for glucose.

B. It inhibits the $Na^+ - K^+$ ATPase pump, destroying the electrochemical gradient.

C. It competes with glucose for the $SGLT - 2$ carrier at the luminal border.

D. It blocks the $GLUT - 2$ facilitated diffusion at the basolateral membrane.

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 6

What is the primary mechanism by which Phlorhizin interferes with glucose handling in the kidney?

A. It increases the tubular transport maximum (T_m) for glucose.

إجابتك غير صحيحة ✗

Blocking the carrier would decrease the effective reabsorption, not increase the maximum capacity.

B. It inhibits the $Na^+ - K^+$ ATPase pump, destroying the electrochemical gradient.

C. It competes with glucose for the $SGLT - 2$ carrier at the luminal border.

الإجابة الصحيحة ✓

Phlorhizin is a competitive inhibitor of the sodium-glucose linked transporters, preventing glucose reabsorption into the cell.

D. It blocks the $GLUT - 2$ facilitated diffusion at the basolateral membrane.

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Physiology Quiz

استنادًا إلى 3 مصادر

In a state of marked Extracellular Fluid (ECF) expansion, how does Atrial Natriuretic Peptide (ANP) affect the renal mesangial cells?

A. It stimulates them to secrete renin, activating the $RAAS$.

B. It causes them to relax, which increases the surface area available for filtration.

B. It causes them to relax, which increases the surface area available for filtration.

C. It causes them to contract, thereby increasing the glomerular hydrostatic pressure.

D. It increases their sensitivity to Aldosterone, enhancing potassium secretion.

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 7

In a state of marked Extracellular Fluid (ECF) expansion, how does Atrial Natriuretic Peptide (ANP) affect the ?renal mesangial cells

A. It stimulates them to secrete renin, activating the $RAAS$.

إجابتك غير صحيحة ✗

inhibits renin secretion to reduce ANP .levels of Angiotensin II and Aldosterone

B. It causes them to relax, which increases the surface area available .for filtration

الإجابة الصحيحة ✓

Relaxation of mesangial cells increases the effective glomerular surface area, thereby .increasing GFR and sodium excretion

C. It causes them to contract, thereby increasing the glomerular hydrostatic .pressure

D. It increases their sensitivity to Aldosterone, enhancing potassium .secretion

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 8

The 'Countercurrent Exchanger' function of the vasa recta is essential for which of ?the following

A. Reducing the blood flow to the renal cortex during systemic hypotension.

B. Actively pumping sodium into the medullary interstitium to create a gradient.

B. Actively pumping sodium into the medullary interstitium to create a gradient.

C. Ensuring the tubular fluid remains isosmotic throughout the collecting duct.

D. Preventing the dissipation of the medullary hyperosmolarity gradient.

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 8

The 'Countercurrent Exchanger' function of the vasa recta is essential for which of ?the following

A. Reducing the blood flow to the renal cortex during systemic hypotension. ✗ إجابتك غير صحيحة

The vasa recta are specialized vessels for the medulla and are not involved in cortical blood flow redistribution.

B. Actively pumping sodium into the medullary interstitium to create a gradient.

C. Ensuring the tubular fluid remains isosmotic throughout the collecting duct.

D. Preventing the dissipation of the medullary hyperosmolarity gradient. ✓ الإجابة الصحيحة

The U-shape of the vasa recta allows solutes to cycle back into the interstitium, ensuring the gradient isn't washed away by blood flow.

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 9

During the renal buffering of H^+ using ammonia (NH_3), what is the chemical fate of the NH_4^+ ion formed in the tubular fluid?

A. It is converted to urea by the renal tubular cells to minimize toxicity.

B. It is reabsorbed into the interstitium via the $Na^+ - H^+$ counter-transport.

B. It is reabsorbed into the interstitium via the $Na^+ - H^+$ counter-transport.

C. It reacts with HCO_3^- within the cell to form water and CO_2.

D. It is excreted in the urine, often in combination with Cl^-.

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 9

During the renal buffering of H^+ using ammonia (NH_3), what is the chemical fate of the NH_4^+ ion formed in the ?tubular fluid

A. It is converted to urea by the renal tubular cells to minimize toxicity.

✗ إجابتك غير صحيحة

Urea cycle primarily occurs in the liver; the kidney uses the NH_3 system specifically for H^+ titration and excretion.

B. It is reabsorbed into the interstitium via the $Na^+ - H^+$ counter-transport.

C. It reacts with HCO_3^- within the cell to form water and CO_2.

D. It is excreted in the urine, often in combination with Cl^-.

✓ الإجابة الصحيحة

Ammonia traps secreted H^+ as ammonium, which is then excreted as ammonium chloride, facilitating acid removal.

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 10

In the case study of 'Muriel,' who presents with metabolic acidosis, which of the following clinical findings is a characteristic compensatory response?

A. Confusion and an increase in blood pH.

B. Hyperventilation to decrease pCO_2.

C. Hypoventilation to increase pCO_2.

D. Increased plasma HCO_3^- levels.

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 10

In the case study of 'Muriel,' who presents with metabolic acidosis, which of the following clinical findings is a ?characteristic compensatory response

A. Confusion and an increase in blood pH.

✗ إجابتك غير صحيحة

Metabolic acidosis involves a decrease in pH; confusion is more associated with the alkalosis case study (Eustace).

B. Hyperventilation to decrease pCO_2.

✓ الإجابة الصحيحة

Hyperventilation is the respiratory system's way of compensating for metabolic acidosis by blowing off CO_2 to raise the pH.

C. Hypoventilation to increase pCO_2.

D. Increased plasma HCO_3^- levels.

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 11

What happens to the osmolarity of the tubular fluid as it reaches the tip of the ?Loop of Henle

A. It rises to approximately 1200 $mOsm/L$ due to the osmosis of water out of the descending limb.

B. It reaches equilibrium with the cortical interstitium at 300 $mOsm/L$.

C. It remains isosmotic at 300 $mOsm/L$ because the descending limb is impermeable to both water and solutes.

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 11

What happens to the osmolarity of the tubular fluid as it reaches the tip of the ?Loop of Henle

A. It rises to approximately 1200 $mOsm/L$ due to the osmosis of water out of the descending limb.

✓ إجابتك صحيحة

As fluid moves down the descending limb, water leaves the tubule into the hyperosmotic medulla, concentrating the solute.

B. It reaches equilibrium with the cortical interstitium at 300 $mOsm/L$.

C. It remains isosmotic at 300 $mOsm/L$ because the descending limb is impermeable to both water and solutes.

D. It falls to 100 $mOsm/L$ because Na^+ is actively pumped out of the descending limb.

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 12

The 'Filtration Fraction' is mathematically defined as the ratio of:

A. Urine Flow Rate to the Plasma Concentration of Inulin.

B. Renal Blood Flow to the GFR.

C. The amount of substance excreted to the amount of substance filtered.

D. GFR to the Renal Plasma Flow (RPF).

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 12

The 'Filtration Fraction' is mathematically defined as the ratio of:

A. Urine Flow Rate to the Plasma Concentration of Inulin.

✗ إجابتك غير صحيحة

This describes components used in the clearance formula, not the filtration fraction.

B. Renal Blood Flow to the GFR.

C. The amount of substance excreted to the amount of substance filtered.

D. GFR to the Renal Plasma Flow (RPF).

✓ الإجابة الصحيحة

Filtration fraction represents the portion of the plasma flowing through the kidney that is actually filtered across the glomerular capillaries.

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 13

Which hormone acts on the principal cells of the distal tubule and collecting duct to increase Na^+ reabsorption in exchange for H^+ or K^+?

A. (Vasopressin) ADH

B. Aldosterone

C. Estrogen

D. (ANP) Atrial Natriuretic Peptide

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 13

Which hormone acts on the principal cells of the distal tubule and collecting duct to increase Na^+ reabsorption in exchange for H^+ or K^+?

A. ADH (Vasopressin)

✗ إجابتك غير صحيحة

ADH primarily increases water permeability in the collecting ducts via $V2$ receptors and aquaporins.

B. Aldosterone

✓ الإجابة الصحيحة

Aldosterone is a mineralocorticoid that stimulates the synthesis of proteins that increase sodium reabsorption and potassium secretion.

C. Estrogen

D. ANP (Atrial Natriuretic Peptide)

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 14

True or False: The renal threshold for a substance is the plasma concentration at which that substance first begins to appear in the urine.

A. True

B. False

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 14

True or False: The renal threshold for a substance is the plasma concentration at which that substance first begins to appear in the urine.

A. True

✓ إجابتك صحيحة

The threshold is the specific plasma level where the filtered load exceeds the reabsorptive capacity of some nephrons.

B. False

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 15

What is the primary role of the Phosphate buffer system in the renal tubules?

A. Facilitating the reabsorption of glucose via the $SGLT-1$ carrier.

B. Increasing the lipid solubility of H^+ so it can diffuse back into the blood.

C. Buffering H^+ in the tubular fluid to allow for further acid secretion.

D. Providing the energy needed for the $Na^+ - H^+$ counter-transport.

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 15

What is the primary role of the Phosphate buffer system in the renal tubules?

A. Facilitating the reabsorption of glucose via the $SGLT-1$ carrier.

إجابتك غير صحيحة ✗

Glucose reabsorption is linked to sodium gradients, not the phosphate buffering of hydrogen ions.

B. Increasing the lipid solubility of H^+ so it can diffuse back into the blood.

C. Buffering H^+ in the tubular fluid to allow for further acid secretion.

الإجابة الصحيحة ✓

By binding to H^+, phosphate prevents the tubular pH from dropping too low, which would otherwise inhibit further H^+ secretion.

D. Providing the energy needed for the $Na^+ - H^+$ counter-transport.

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 16

Which of the following describes the 'True Renal Plasma Flow' calculation?

A. The clearance of Inulin divided by the plasma concentration of Creatinine.

B. The urine volume per minute multiplied by the concentration of PAH in the plasma.

C. Effective RPF multiplied by the Filtration Fraction.

D. Effective RPF divided by the Extraction Ratio.

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 16

Which of the following describes the 'True Renal Plasma Flow' calculation?

A. The clearance of Inulin divided by the plasma concentration of Creatinine.

✗ إجابتك غير صحيحة

This is an incorrect combination of terms that does not relate to renal plasma flow calculations.

B. The urine volume per minute multiplied by the concentration of PAH in the plasma.

C. Effective RPF multiplied by the Filtration Fraction.

D. Effective RPF divided by the Extraction Ratio.

✓ الإجابة الصحيحة

Because the kidney doesn't remove 100% of substances like PAH in one pass, the effective flow must be adjusted by the extraction ratio for the true value.

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 17

In the $S1$ segment of the proximal tubule, which carrier is responsible for the co-transport of Na^+ and Glucose at a $1:1$?stoichiometry

A. ATPase $Na^+ - K^+$

B. $GLUT-2$

C. $SGLT-2$

D. $SGLT-1$

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 17

In the $S1$ segment of the proximal tubule, which carrier is responsible for the co-transport of Na^+ and Glucose at a $1:1$?stoichiometry

A. ATPase $Na^+ - K^+$

إجابتك غير صحيحة ✗

This is an active transport pump, not a co-transporter for glucose.

B. $GLUT-2$

C. $SGLT-2$

الإجابة الصحيحة ✓

As shown in the figures, $SGLT-2$ is the primary carrier in the early proximal tubule transporting one sodium ion for every glucose molecule.

D. $SGLT-1$

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 18

What physiological change is observed in 'Eustace,' the case study for metabolic alkalosis?

A. Hypoventilation and increased pCO_2.

B. Increased secretion of H^+ and ammonia in the urine.

C. A decrease in both pH and HCO_3^-.

D. Severe headache and hyperventilation.

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 18

What physiological change is observed in 'Eustace,' the case study for metabolic alkalosis?

A. Hypoventilation and increased pCO_2.

✓ إجابتك صحيحة

To compensate for high HCO_3^- and high pH, the body slows breathing to retain CO_2 (an acid).

B. Increased secretion of H^+ and ammonia in the urine.

C. A decrease in both pH and HCO_3^-.

D. Severe headache and hyperventilation.

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 19

Which component of the bicarbonate buffer system is primarily controlled by the kidneys?

A. Hemoglobin

B. (Carbonic acid) H_2CO_3

C. (Bicarbonate concentration) $BHCO_3^-$

D. $Na^+ - K^+$ exchange pump

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 19

Which component of the bicarbonate buffer system is primarily controlled by the kidneys?

A. Hemoglobin

✗ إجابتك غير صحيحة

Hemoglobin is part of the protein buffer system, not the bicarbonate system.

B. (Carbonic acid) H_2CO_3

C. Bicarbonate) $BHCO_3^-$ (concentration

✓ الإجابة الصحيحة

The kidneys regulate the bicarbonate concentration through reabsorption and synthesis, while the respiratory system regulates CO_2 (H_2CO_3).

D. exchange pump $Na^+ - K^+$

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 20

An increase in renal interstitial fluid hydrostatic pressure has what effect on sodium handling?

A. It increases the primary active transport of sodium at the basolateral border.

B. It enhances the backleak of sodium into the tubular lumen.

B. It enhances the backleak of sodium into the tubular lumen.

C. It stimulates the release of Aldosterone to increase Na^+ reabsorption.

D. It reduces urine output to conserve arterial blood pressure.

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 20

An increase in renal interstitial fluid hydrostatic pressure has what effect on sodium handling?

A. It increases the primary active transport of sodium at the basolateral border.

✗ إجابتك غير صحيحة

Interstitial pressure acts as a physical force that opposes reabsorption rather than stimulating active transport proteins.

B. It enhances the backleak of sodium into the tubular lumen.

✓ الإجابة الصحيحة

High interstitial pressure pushes fluid and solutes back through the tight junctions into the tubule, reducing net reabsorption.

C. It stimulates the release of Aldosterone to increase Na^+ reabsorption.

D. It reduces urine output to conserve arterial blood pressure.

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 21

True or False: According to the source, the clearance of Urea is typically greater than 125 ml/min.

A. True

B. False

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 21

True or False: According to the source, the clearance of Urea is typically greater than 125 ml/min.

A. True

✗ إجابتك غير صحيحة

Only substances that are secreted (like PAH or creatinine) have clearance values higher than the GFR.

B. False

✓ الإجابة الصحيحة

Urea is partially reabsorbed, meaning its clearance is less than the GFR (which is 125 ml/min).

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Physiology Quiz

استنادًا إلى 3 مصادر

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What is the secondary messenger used by Atrial Natriuretic Peptide (ANP) to facilitate its fast renal effects?

A. $cAMP$

B. $cGMP$

C. New protein synthesis

D. Adenylate cyclase

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 22

What is the secondary messenger used by Atrial Natriuretic Peptide (ANP) to facilitate its fast renal effects?

A. $cAMP$

✗ إجابتك غير صحيحة

$cAMP$ is the secondary messenger for ADH (Vasopressin) acting on $V2$ receptors.

B. $cGMP$

✓ الإجابة الصحيحة

ANP activates guanylate cyclase, which produces $cGMP$ to mediate its effects on GFR and sodium transport.

C. New protein synthesis

D. Adenylate cyclase

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 23

If a substance has a plasma concentration (P_x) of $1\ mg/ml$ and its urinary excretion rate ($U_x \cdot V$) is 1 ?(C_x) mg/min, what is its clearance

A. $650\ ml/min$

B. $125\ ml/min$

C. $1\ ml/min$

D. $0\ ml/min$

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 23

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A. $650\ ml/min$

× إجابتك غير صحيحة

This value corresponds to the clearance of PAH, not the calculation derived from the provided numbers.

B. $125\ ml/min$

C. $1\ ml/min$

✓ الإجابة الصحيحة

Clearance is calculated as $(U_x \cdot V)/P_x$; here, $1\ mg/min$ divided by $1\ mg/ml$ equals $1\ ml/min$.

D. $0\ ml/min$

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 24

What is the role of the enzyme Carbonic Anhydrase ($C.A.$) in the process of ?bicarbonate reabsorption

It binds directly to H^+ to prevent .A .4.5 urine pH from falling below

.B It acts as a lipid-soluble carrier for .ammonia into the tubular fluid

.C It facilitates the active transport of .Na^+ across the luminal membrane

.D It catalyzes the conversion of H_2CO_3 into CO_2 and H_2O in the tubular .lumen

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 24

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It binds directly to H^+ to prevent .A .4.5 urine pH from falling below

✗ إجابتك غير صحيحة

This describes the role of buffers like phosphate or ammonia; Carbonic Anhydrase is an enzyme facilitating .reactions

.B It acts as a lipid-soluble carrier for .ammonia into the tubular fluid

.C It facilitates the active transport of .Na^+ across the luminal membrane

.D It catalyzes the conversion of H_2CO_3 into CO_2 and H_2O in the tubular .lumen

✓ الإجابة الصحيحة

This allows bicarbonate (as CO_2) to diffuse across the cell membrane, since the .HCO_3^- ion itself cannot cross easily

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 25

Which of the following is true regarding ?(T_m) the transport maximum

A. The T_m for glucose is reached when the plasma concentration is 100 mg/dL.

B. It occurs because the carrier systems for actively transported solutes become saturated.

C. It is only relevant for substances that are passively reabsorbed, like urea.

D. It is a measure of the volume of plasma cleared per unit time.

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 25

Which of the following is true regarding ?(T_m) the transport maximum

The T_m for glucose is reached when .A 100 the plasma concentration is mg/dL.

× إجابتك غير صحيحة

is a normal plasma level; the mg/dL 100 T_m for glucose is reached at much higher concentrations where glucose appears in .urine

It occurs because the carrier systems .B for actively transported solutes .become saturated

✓ الإجابة الصحيحة

Active transport relies on specific proteins; once all available proteins are occupied, the .transport rate cannot increase further

It is only relevant for substances that .C .are passively reabsorbed, like urea

It is a measure of the volume of .D .plasma cleared per unit time

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 26

According to the hormonal control table, what is the effect of ADH on the late distal tubule and collecting duct?

A. It stimulates the $Na^+ - K^+$ ATPase pump to increase salt reabsorption.

B. It decreases the surface area for filtration by contracting mesangial cells.

C. It triggers new protein synthesis to increase K^+ secretion.

D. It increases water permeability by

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 26

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B. It decreases the surface area for filtration by contracting mesangial cells.

C. It triggers new protein synthesis to increase K^+ secretion.

✗ إجابتك غير صحيحة

This describes the 'slow' mechanism of Aldosterone; ADH works via a 'fast' secondary messenger system.

D. It increases water permeability by activating $V2$ receptors.

✓ الإجابة الصحيحة

ADH binds to basolateral $V2$ receptors, stimulating $cAMP$ and increasing the water permeability of the principal cells.

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 27

Which buffer system acts immediately to trap H^+ until respiratory and renal mechanisms can respond?

A. Hyperventilation through the lungs

B. Bicarbonate buffer system

C. The NH_3 system in the collecting ducts

D. Primary active transport of sodium

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 27

Which buffer system acts immediately to trap H^+ until respiratory and renal mechanisms can respond?

A. Hyperventilation through the lungs

✗ إجابتك غير صحيحة

Respiratory mechanisms take minutes to act, making them the second line of defense after chemical buffers.

B. Bicarbonate buffer system

✓ الإجابة الصحيحة

Chemical buffers like the bicarbonate system act as the first line of defense, providing an instant response to pH changes.

C. The NH_3 system in the collecting ducts

D. Primary active transport of sodium

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 28

What is the effect of Oubain on the tubular handling of glucose?

A. It makes the tubular cells more permeable to water, diluting the glucose concentration.

B. It acts as a competitive inhibitor for glucose at the $GLUT-2$ carrier.

B. It acts as a competitive inhibitor for glucose at the $GLUT-2$ carrier.

C. It increases the number of $SGLT-2$ carriers to maximize glucose reabsorption.

D. It blocks the $Na^{+}-K^{+}$ ATPase pump, inhibiting the gradient needed for glucose transport.

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 28

What is the effect of Oubain on the tubular handling of glucose?

A. It makes the tubular cells more permeable to water, diluting the glucose concentration.

✗ إجابتك غير صحيحة

Oubain's primary target is the ion pump on the basolateral membrane, not water permeability.

B. It acts as a competitive inhibitor for glucose at the $GLUT-2$ carrier.

C. It increases the number of $SGLT-2$ carriers to maximize glucose reabsorption.

D. It blocks the Na^+-K^+ ATPase pump, inhibiting the gradient needed for glucose transport.

✓ الإجابة الصحيحة

By stopping the pump, sodium concentrations inside the cell rise, which eliminates the driving force for secondary active glucose transport.

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 29

True or False: The kidneys are only excretory organs and do not play a role in regulating the composition of body fluids.

A. False

B. True

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 29

True or False: The kidneys are only excretory organs and do not play a role in regulating the composition of body fluids.

False .A

✓ إجابتك صحيحة

The text explicitly states the kidneys are both excretory and regulatory organs, maintaining the volume and composition of body fluids.

True .B

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 30

Which substance is used to measure $(ERPF)$ "Effective Renal Plasma Flow"?

A. Inulin

B. Hemoglobin

C. PAH

D. Glucose

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Physiology Quiz

استنادًا إلى 3 مصادر

30 / 30

Which substance is used to measure "Effective Renal Plasma Flow ($ERPF$)?

A. Inulin

✗ إجابتك غير صحيحة

Inulin is used to measure GFR, not renal plasma flow.

B. Hemoglobin

C. PAH

✓ الإجابة الصحيحة

PAH is used because it is almost entirely removed from the plasma in a single pass through the kidneys via filtration and secretion.

D. Glucose

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