



جامعة الرّفعت

PHYSIOLOGY

MORPHINE ACADEMY

السلام عليكم ورحمة الله وبركاته

يتم الانتهاء من تكرييفه على شرف التأهل، فكمان مرة بعتذر عن
الأخطاء الاملائية، وهاد التكرييف ركزوا عليه كويس لأنّه الدكتورة حكت
النصيب الأكبر جاي منه وما بدّها توسيع معظم سلайдاته

واهم اشي تدعولي اخلص المادة قبل الامتحان ❤️👍

بالتوفيق

و white blood cells و blood vessels, vasoconstrictors, vasodilators if جنابي go off
Myogenic mechanism if no change in pressure, vasoconstrictors, vasodilators if اعلى الورى للplatelets
Kidneys if blood flow is not constant (constant) cause GFR if ارتفاع
Kidneys if اعلى من المعتاد if Afferent Arteries if vasoconstriction if increase
blood aff. vessels if from the myogenic mechanism, from the Autoregulation
vasoconstriction of the blood vessels if Endothelial cells if
Major Afferent Arteries if vasoconstrictors if
Kidneys if اعلى من المعتاد if blood vessels if
Tubuloglomerular Filtration of feedback if Autoregulation if
if Efferent if, Afferent if the capillary blood diameter if
if GFR if Tubules if less filtration alpha if the blood if
Macula Densa if cells if in the - if Tubules if اعلى من المعتاد if blood flow if
and sensitive receptors if the blood if Distal convoluted tubules if Macula Densa if
if the cells if, sensitization if the water if the blood if
Afferent Arteries if vasoconstriction if Vasoconstrictors, Vasoconstrictors if vasoconstrictors
Afferent Arteries if blood vessels if not from the kidney itself if Autoregulation if blood vessels
vasoconstriction if vasoconstrictors if Macula Densa if Endothelial cells if no
regulation if او طفيفا ← Kidneys if اعلى من المعتاد if blood flow if اقل من المعتاد if, Afferent Arteries if
constant GFR if اعلى من المعتاد if GFR if
sympathetic nervous system if Low Activation if اقل من المعتاد if, neural regulation if
Efferent, Afferent Arteries if dilation if the blood if Afferent if
dilation if the blood if Afferent if dilation if the blood if sympathetic if
no if the blood if Autoregulation if the blood if less than Efferent if
Tubuloglomerular Filtration of feedback if myogenic if if neural regulation if
Afferent if vasoconstriction if yes if sympathetic if Modulate Activation if
the Afferent if vasoconstriction if the same level if Efferent if vasoconstriction

Afferents (أعصاب مدخلية)負責 vasoconstriction (التشنج الدموي) due to sympathetic stimulation (تحفيز الأعصاب المعاين). Efferent (أعصاب خارجية)负责 vasoconstriction (التشنج الدموي) due to sympathetic stimulation (تحفيز الأعصاب المعاين) and Efferent (أعصاب خارجية)负责 vasoconstriction (التشنج الدموي) due to blood volume reduction (ลด حجم الدم) and decrease in renal blood flow (نفاذ الدم الكلوي). Efferents (أعصاب خارجية) also responsible for GFR (نفاذ الكلى) increase by increasing glomerular capillary pressure (زيادة ضغط الأوعية الدموية في الكلى) and decreasing tubular reabsorption (زيادة امتصاص البول في الأمعاء). Urine output (نفاذ البول) is increased by increasing blood flow (نفاذ الدم) to kidneys (الأمعاء) and decreasing blood flow (نفاذ الدم) to systemic circulation (النظام الدموي) due to sympathetic stimulation (تحفيز الأعصاب المعاين).

Hormonal Regulation of GFR

• ANP, Angiotensin II

• ↓ GFR

• ↓ Vasoconstriction

• ↓ Cardiac output

• ↓ Renal blood flow

• ↓ GFR

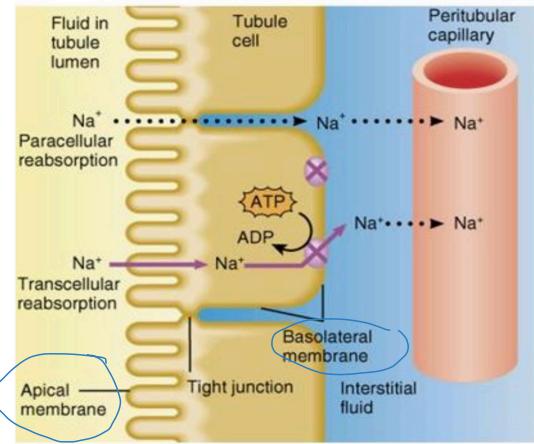
• ↓ Filtration pressure

• ↓ Glomerular Filtration Rate

* بالنتيجة لا Topic في ما كتب امامها الـ lecture سترسمها بالفرقة التي لا تزال راهماً (لهم يكفي) لكن في
التفايرن يا عزيزي المدرس و يكن المدرس) لاحظ في تفاصيل مسحه اذا صدر لك تحفظها، فرضاً معي على اية
بالذريعة بذلك ترس لها معاشر (ومن) المدارس كثيرة تفاصيل مفهوم الارقام العددية انسان صغير ورگز (له) :

peritubular capillaries \rightarrow Tubular secretion \rightarrow peritubular capillaries \rightarrow systemic circulation \rightarrow back to blood vessels

peritubular capillaries \rightarrow interstitial fluid \rightarrow tubules \rightarrow lumen \rightarrow kidney



Reabsorption is the process of moving substances from the lumen back into the body. It can occur via paracellular pathways or transcellular pathways.

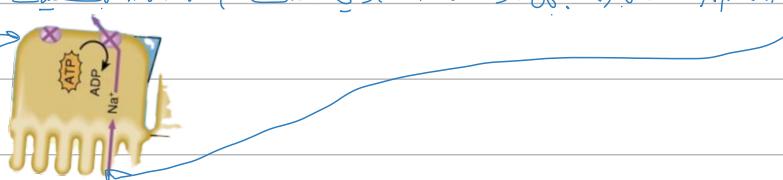
Transcellular reabsorption involves moving across the apical membrane, through the cytoplasm, and across the basolateral membrane.

(Facile) leaky gap junctions and paracellular pathways are low-concentration pathways.

(Low concentration to high concentration) \rightarrow Diffusion across the membrane.

Two membranes are involved in transcellular reabsorption.

Basolateral membrane and apical membrane.



Basolateral membrane \rightarrow Apical membrane \rightarrow Transcellular Reabsorption.

It involves peritubular capillaries and interstitial fluid.

It moves in one direction. Reabsorption.

Lumen \rightarrow Na⁺ \rightarrow Interstitial fluid. Transport proteins. Diffusion.

Basolateral diffusion across Apical membrane \rightarrow Tubules \rightarrow

\rightarrow Sodium-potassium pump \rightarrow Transport proteins \rightarrow Membrane.

Apical membrane \rightarrow interstitial fluid \rightarrow Basolateral membrane.

Proximal convoluted tubule. Proximal convoluted tubule \rightarrow Lumen \rightarrow In this part, there is active transport.

At the same time, there are symporters and antiporters. Active transporters use energy.

What is the role of the Na⁺-K⁺ ATPase pump? It moves Na⁺ out and K⁺ in.

What is the role of the symporter? It moves glucose and Na⁺ together.

What is the role of the antiporter? It moves H⁺ out and NH₄⁺ in.

What is the role of the glucose transporter? It moves glucose in easily.

What is the role of the Na⁺-K⁺ ATPase pump? It moves Na⁺ out and K⁺ in. It is the maximum transport rate.

Transport maximum (maximum transport) هي المقدار الأقصى الذي يمكن نقله من الماء، وهو محدود بـ
Transport proteins → Transporters
Second half → First half → Proximal convoluted tubule
درجه ت Sofar بالـ second Half في عند (يون = ناتج كهربائي، يتوخ) Distant tubule
في هناك اجزاء، كلها علم هو اهمها (أو، والـ first part) هو ما ينفع
Apical membrane (symporters) ذات جزيئي صوريق مع حموضة تكونه هو ماء (والـ proximal convoluted tubule concept) اطلب جزء باهتمام (والـ Basolateral membrane وجزء باهتمام)
Basolateral membrane) هو جزء Apical membrane (والـ first part)، Transcellular reabsorption (والـ second part)
ابو مقدمة، منها راح تعرف انها: برأس symporters، في هناك (والـ Anti-porters)
Diffusion (والـ Basolateral membrane)، Sodium-potassium pump (والـ Transport proteins (والـ leaky channels (والـ Apical membrane (والـ Basolateral membrane (والـ proximal convoluted tubule (والـ water Reabsorption (والـ 90% لفروع حالي):
والـ collecting duct (والـ 10% بغير ماء)، الماء المتبقي (والـ Descending Loop of Henle
والـ water (والـ Reabsorption (والـ late Distal convoluted tubules
لذلـ obligation (والـ obligately) (والـ obligation water reabsorption (والـ اشاره اعـ water Reabsorption (والـ 90% بغير ماء)، Descending Loop of Henle، proximal convoluted tubule (والـ . the solutes (والـ Descending Loop of Henle، proximal convoluted tubule (والـ
Facultative water reabsorption (والـ collecting duct (والـ late Distal convoluted tubule (والـ في بالـ الماء (والـ الـ ADH (والـ Antidiuretic Hormone) ADH (والـ
Not, the N reabsorption (والـ ADH (والـ ADH (والـ Antidiuretic Hormone) ADH (والـ
reabsorption (والـ ADH (والـ Activation (والـ ADH (والـ ADH (والـ Distal convoluted tubule (والـ
collecting duct (والـ late Distal convoluted tubule) (والـ ADH (والـ ADH (والـ
+ the hormone (والـ parathyroid hormone (PTH) (والـ PTH (والـ fluid compartments (والـ
thyroid hormones (والـ thyroid gland (والـ PTH (والـ Endocrine system (والـ parathyroid gland (والـ
parathyroid hormone (والـ parathyroid gland (والـ Endocrine system (والـ bases (والـ
S⁺ ions) (والـ Reabsorption (والـ Ca²⁺ ions) (والـ Reabsorption (والـ parathyroid hormone (والـ

normally

90% of the filtrate is reabsorbed in the proximal convoluted tubule by parathyroid hormone.

Descending loop of Henle, proximal convoluted tubule undergoes active Reabsorption.

Is there active reabsorption in the distal convoluted tubule? If yes, what is it?

Afferent arterioles vasoconstriction leads to a decrease in blood flow.

Kidneys decrease blood flow to the kidneys by decreasing blood flow to the glomerulus.

Glomerular filtration rate (GFR) is constant and GFR = $\frac{K_f \times K_d}{K_g}$.

Renin-angiotensin system (RAS) releases vasoconstrictors from Macula densa cells in the afferent arterioles.

Renin-angiotensin system (RAS) releases vasoconstrictors from Macula densa cells in the afferent arterioles.

Kidneys increase blood flow to the glomerulus.

Factors affecting GFR:

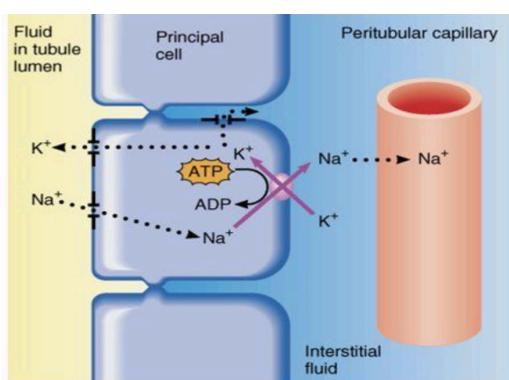
Decreased blood flow leads to a decrease in blood flow.

GFR maintains blood flow to the kidneys by increasing blood flow.

Decreased systemic circulation by BP, blood flow is reduced.

NE and ADH and Angiotensin-Aldosterone system increase blood flow.

ADH increases blood flow to the kidneys.



أين الميكانيزم الذي يحيط به نشاط هذه الخلية؟

H^+ و Na^+ balance.

systemic circulation maintains normal blood pressure.

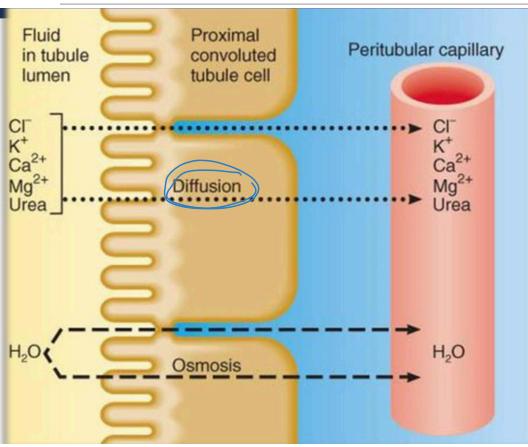
الناتج عن ارتفاع البوتاسيوم في الدم هو ارتفاع الكالسيوم في الدم.

Hyperkalemia leads to increased potassium reabsorption in the distal convoluted tubule.

Hypernatremia leads to decreased potassium reabsorption in the distal convoluted tubule.

(Hyperkalemia leads to increased potassium reabsorption in the distal convoluted tubule.)

Urine concentration of Na⁺ \rightarrow urine volume \downarrow
Blood \downarrow Hypo \rightarrow Hyper \downarrow blood concentration of Na⁺



collecting duct \& late Distal convoluted tubule \rightarrow تمثيل

② Interdigitated cells ① principal cells : \rightarrow نووي و محيط

\rightarrow الباقي ينتمي إلى المتصاويف التي تعرف بالخلايا المتماكنة (الخلايا المتماكنة)

symporters \rightarrow من \downarrow diffusion \rightarrow من \downarrow Apical membrane \rightarrow من \downarrow طرف

leaky channels \rightarrow من \downarrow من \downarrow من \downarrow Antiporters \rightarrow من \downarrow من \downarrow

leaky channels \rightarrow العصارات والبوتاسيوم يدخلوا من \downarrow من \downarrow من \downarrow البوتاسيوم هام جداً ، العصارات من \downarrow من \downarrow من \downarrow البوتاسيوم

Update Physiology test 10 part 2 (D) AD-Adrenal T, Adrenocortical			
TEST 10			
Hormones Regulation of Tuberous Reticulation and Tuberous Society			
	MECHANISM THAT ACTIVATES	MECHANISM AND SITE OF ACTION	EFFECTS
Adrenocortical	Live fire in the blood increased levels of adrenocortical products of ergotamine	stimulus acting on "A" receptors stimulus acting on "B" receptors	increased blood flow to head increased blood flow to heart increased heart rate and blood pressure increased respiration rate and blood pressure increased heart rate and blood pressure
Adrenoreceptors	Increased expression of D1 and D2 receptors in the brain	Enhanced release of epinephrine from sympathetic nerve terminals Enhanced release of norepinephrine from sympathetic nerve terminals Enhanced release of epinephrine from adrenal medulla Enhanced release of norepinephrine from adrenal medulla	Enhanced release of epinephrine from sympathetic nerve terminals Enhanced release of norepinephrine from sympathetic nerve terminals Enhanced release of epinephrine from adrenal medulla Enhanced release of norepinephrine from adrenal medulla
Parasympathetic nervous system (PNS)	Dominant level of ACh^+ products of PNS from sympathetic nervous system	Enhanced release of ACh^+ from post-synaptic terminals Enhanced release of ACh^+ from pre-synaptic terminals Enhanced release of ACh^+ from post-synaptic terminals Enhanced release of ACh^+ from pre-synaptic terminals	Enhanced release of ACh^+ from post-synaptic terminals Enhanced release of ACh^+ from pre-synaptic terminals Enhanced release of ACh^+ from post-synaptic terminals Enhanced release of ACh^+ from pre-synaptic terminals

اند تھیں۔

Afterload / preload / stroke volume / cardiac output : $\frac{GFR}{\text{venous Return}} \sim \frac{\text{venous Return}}{GFR}$

వి. శ్రీ వు. గుణేంద్ర, కుమార్ ఆయు - Topic 51 సెప్టెంబర్

PRODUCTION OF DILUTE AND CONCENTRATED URINE

. proximal convoluted tubules loop of Henle

• proximal convoluted tubules \downarrow , Na^+ reabsorption \downarrow Reabsorption $\approx 90\%$ of Na^+

Osmolarity \rightarrow $H_2O \rightarrow$ Not Reabsorption \rightarrow High osmolarity (ارتفاع تركيز الماء)

الجذور تحيط بالغشاء الظهاري (الغشاء المخاطي) مما يغير كثافة الماء في الماء المحيط مما يزيد من التurgor.

Ascending loop of Henle S1. \rightarrow j₁¹ to Ascending J₁, Mo₁ & N₁ Reabsorption J₁ \rightarrow j₁²

Distal convoluted tubules \downarrow Jéry \downarrow urea \downarrow into sysy, (où est jé) water \downarrow Impermeable \downarrow

ڈیس میٹالیک وائٹ ہائیڈر اینڈ ہائیڈرولوگی، Antidiarrhetic Hormone just into collecting ducts ہے

النظام للهواء هو اى ؟، collecting ducts (Distal) في (concentrated) diluted urine

Descending loop of Henle \rightarrow proximal \downarrow H_2O , N^+ \downarrow Reabsorption 90% \rightarrow (initial segment) collecting system

• Cl⁻ Not Reabsorption water N Reabsorption \downarrow Ascending IV water N Reabsorption \downarrow Log

Ascending الحجر ؟ osmolarity حى يعنى فتو

What is Na^+ Reabsorption along the proximal convoluted tubules? اسے اپنے

التركيز والصلادة، σ Salinity هي concetration ، π pressure و ψ osmolarity.

Cí Ná Níne Óile (séil éile pís air gheal) Ascending JL, Descending loop of Henle

- Na^+ و Cl^- Not Significant (غير ملحوظ) on osmolarity (التركيز)

تمام واحد عاریت می کنند و بعد از آنکه آنها تقویت می کنند (عدها).

Ascending limb (Descending Loop of Henle, Proximal convoluted Tubules) Reabsorption

collecting duct), Distal \rightarrow Na^+ , K^+ reabsorption, H^+ secretion, Cl^- secretion, Ca^{2+} reabsorption, Mg^{2+} excretion, NH_4^+ excretion.

↓ osmoreceptors ↓ activation \rightarrow ↓ ADH release \rightarrow ↓ ins. diff. Antidiuretic hormones ? focus on water reabs.

urine \gg glomerular filtrate \rightarrow osmolarity \gg Reabsorption \gg Antidiuretic hormone (ADH) from hypothalamus

This will be systemic circulation. Reabsorption: air goes to $\text{H}_2\text{O} \text{ (left), concentrated}$
concentrated urine

Ascending Sympathetic fibers do not reabsorb 90% of their BVA fibers: Dilated urine Sympathetic

فِي مَنْهُ عِنْدَهُ لِلَّهِ تَوْضِيلٌ وَالْمُؤْمِنُ بِهِ هُوَ مُهْجُومٌ وَالْمُكَافِرُ

\rightarrow (solute) concentration \downarrow , \rightarrow osmolarity \downarrow (note: $H_2O \downarrow$, $Na^+ \downarrow$ Reabsorption)

Diluted urine \rightarrow Insufficient Secretion of urine \rightarrow Reabsorption of urine is reduced

diluted v concentrated ~~and~~ or Add H₂O \rightarrow \downarrow more concentrated \rightarrow Diluted urine \rightarrow urine

هار بـ اللـي بيـ إـلـيـ لـفـوـهـ مـعـهـونـهـ.

54 ~~not~~ in)

→ حاسة في ساعتها سبب هجوم اليماني على مأرب حيث ادّي الى تدمير

مُبَلِّغٌ أَنَّ الْأَسْمَاءَ الْمُذَكَّرَةَ وَالْمُفْقَلِمَ الْجَوَابَ لَا هُنَّ

بالنسبة للكidneys تبين لنا اول+بيانKidneys Functions

$\Delta V = 24 \text{ ml}$ (1-2) \rightarrow no net ΔV volume S_1 (ستاتيك) volume ΔV ①

٢) علار Bleeding: اذ امْسِكَ بِالرَّجُلِ فَمِنْ مَنْهُ دَمٌ يَرْجُفُ الْكَرْفَةَ كَيْفَ؟

بین ۸ کل و ۱۸ سنای اسلوونیا او ایستاده بود

* water) has concentrated urine (سقاق) is a transparent liquid (Juicy) Turbidity

- Fruity  سُنْدَلْيَةٌ Aromatic  أَرْجُونْيَةٌ odor رائحة

vegetation) soil Acidity (high soil protein (البيئة) pH

• pH Scales

فهي تسمى بـ **البُلْبُل** (Albulminuria) - انتشار البروتين في البول.

الجلطات الكلوية Nephrotic syndrome and syndrome of coagulation disorders

جسیکا، دماغی و متر قدریں لکھ کر جسے دماغی و متر قدریں لکھ کر blood to urine ratio ہے جسے دماغی و متر قدریں لکھ کر blood to urine ratio ہے

- fluorescence \rightarrow this gives more stress \Rightarrow inc. H_2O availability, $\&$ S^{2-} (highly soluble) \Rightarrow increased solubility

(urine) blood Hematuria

(urine 5%) ketonuria ,

• (مايكروبز) Mycrobz ➤

(BUN)

② plasma creatinine ① Blood urea Nitrogen: two blood test Blood test Jv 181 µL [B]

carbamid metabolism \rightarrow urea \rightarrow no side products \rightarrow blood Nitrogen \rightarrow BUN \downarrow .

Kidneys synthesize list, GFR is Related directly to BUN & amino acids synthesize

وهي تحيط بالجهاز اللمفي وتحميه من التهابات المجرى الهوائي.

BUN \downarrow with low protein \downarrow Hg^+

creatinine level (in skeletal muscle) \rightarrow (1) By product \rightarrow (2) plasma creatinine

Poor Renal Function \downarrow 1-5 mg/mmol Jct \sqrt{S} Tkt

مقدار تخلص الماء من مادة معينة في الملاحة (plasma clearance) $\frac{\text{مقدار الماء}}{\text{مقدار الماء}} \times 100$

لهم كثرن على \leftarrow يعني من تكون لبعضها \rightarrow معاً كثرة كثرة \leftarrow ونقول \rightarrow بـ (clearance) Penicilline

$$\frac{U + V}{P} \xrightarrow{\text{Volume of urine output}} \text{Concentration of drug in plasma}$$