

- D. Mutation in the **SCNN1B and SCNN1G genes** lead to changes in the beta and gamma subunits of ENaC channels, upregulation of this channel.
- E. The renin-angiotensin system in Liddle's syndrome is down-regulated.
4. Which statement is incorrect regarding the *Apparent mineralocorticoid excess*?
- A. In an unaffected individual, **11 β -hydroxysteroid dehydrogenase type 2 inactivates circulating cortisol** to the less-active metabolite **cortisone**.
- B. There is elevation of cortisone in the kidneys (False, **high cortisol concentration** in the kidneys)
- C. The 11 β -HSD2 enzymes are up-regulated in Apparent mineralocorticoid excess (False, **HSD2 have decreased activities**)
- D. There is **high renal cortisol levels** that stimulate renal mineralocorticoid receptor that **increases expression ENaC channels, Na⁺/K⁺ pumps** that reabsorb Na.
- E. There is over-load of aldosterone (False, **low aldosterone levels**, pseudo aldosterone syndrome)
5. Which statement is incorrect regarding the *Glucocorticoid suppressible/remediable hyperaldosteronism*?
- A. The gene that codes 11 β -hydroxylase produces glucocorticoids sit next to the gene that codes for aldosterone synthase.
- B. The chimeric gene has front part from **11 β -hydroxylase and back from aldosterone synthase**. Signals of producing glucocorticoids convert into producing aldosterone.
- C. **Aldosterone synthase** gene is controlled by **ACTH-sensitive genetic promoter**.
- D. We cannot turn off the glucocorticoid system as treatments (False)
6. Which statement is incorrect?
- A. *Mutation in the mineralocorticoid receptor genes* can lead to hypertension.
- B. Hypertension in pregnancy can be **abnormal stimulation of MR by progesterone**.
- C. **Gordon's syndrome has normal level of aldosterone (false, low renin and aldosterone level)**
- D. Gordon's syndrome involves mutations in WNK1 and WNK4, leading to increased expression of ENaC, Na-K pumps.
7. Which statement is incorrect?
- A. In Gordon's syndrome, there is volume expansion due to **over-absorption of K⁺ and Na⁺**, hyperkalemia and hypertension.
- B. In Gordon's syndrome, there is abnormal glomerular filtration rate (**False, the glomerular filtration rate is normal**)
- C. In hypertension with brachydactyly, the condition resembles essential hypertension, whereas renin, aldosterone, and norepinephrine responses are normal and no salt sensitivity is present.
- D. In hypertension with brachydactyly, diminished baroreflex sensitivity with markedly impaired blood pressure buffering.
- E. In hypertension with brachydactyly短指症, patients have abnormal autonomic baroreceptor reflex function and have missense mutation in the PDE3A.

A5.

1. Which statement is correct?
 - A. On average, females have higher BP (false, men's higher)
 - B. Weight and height do not correlate with bP (false, they correlate)
 - C. Cardiac output and TPR determines the MAP, the average amount of blood in the cardiac cycle.**
 - D. In standing up, stroke volume increases (false, it drops)
 - E. TPR keep decreasing in response to stand up (false, TPR and heart rate increase)

A6 Renovascular hypertension

1. Which statement is incorrect?

- A. Diseases can impair renal perfusion to the kidneys, renal hypoperfusion hyper activates the renin-angiotensin-aldosterone axis and lead to hypertension eventually.
- B. Renovascular hypertension (or "renal hypertension") is a condition in which high blood pressure is caused by the kidneys' hormonal response to narrowing of the arteries supplying the kidneys.**
- C. Kidneys do not contribute much to TPR (false)
- D. Kidneys filter 200L plasma and 1L/min cardiac output, 20% of cardiac output.

2. ADPKD...

- A. It is an autosomal recessive polycystic kidney disease (false, it is autosomal dominant polycystic kidney disease)
- B. It is an extremely rare genetic disease (false, it is common genetic disease, 1/700)
- C. The cysts only form in the kidneys (false, cyst formation in a range of ductal organs, 100% in kidneys, 80% in gut, pancreas, spleen, 70% in liver, 10% in blood vessels, 15% in heart)
- D. ADPKD patients tend to have late hypertension and renal failure (False, early hypertension)

3. ADPKD renal cysts...Which one is incorrect?

- A. Appear in utero, from only 1% of nephrons, thin-walled dilation, lose continuity with nephron.
- B. The growth of the cysts: The cysts lose continuity with nephron, the urine fluid is secreted via the wall of the cysts, the cysts grow by obtaining fluid within.
- C. The nephron flow is obstructed.
- D. Abnormalities happen in cell proliferation and compliant basement membrane that too much signals sent to the cell to enhance the proliferation (**False, no signals are sent to inhibit the proliferation**).
- E. Polycystin-1 spans the cell membrane of kidney cells, so that one end of the protein remains inside the cell and the other end projects from the outer surface of the cell.

4. Which statement is correct?

- A. Most of the ADPKD mutations happen in PKD2 gene (false, 85% cases happen in PKD1 gene, more than 64 different mutations are found)
- B. PKD2 is on chromosome 16 (False, PKD1 is on chromosome 16)**
- C. PKD1 is on chromosome 4 (False, PKD2 is on chromosome 4)**

D. **PKD2 involves in the Ca²⁺ movements out of ER membrane.**

5. Which statement is incorrect?

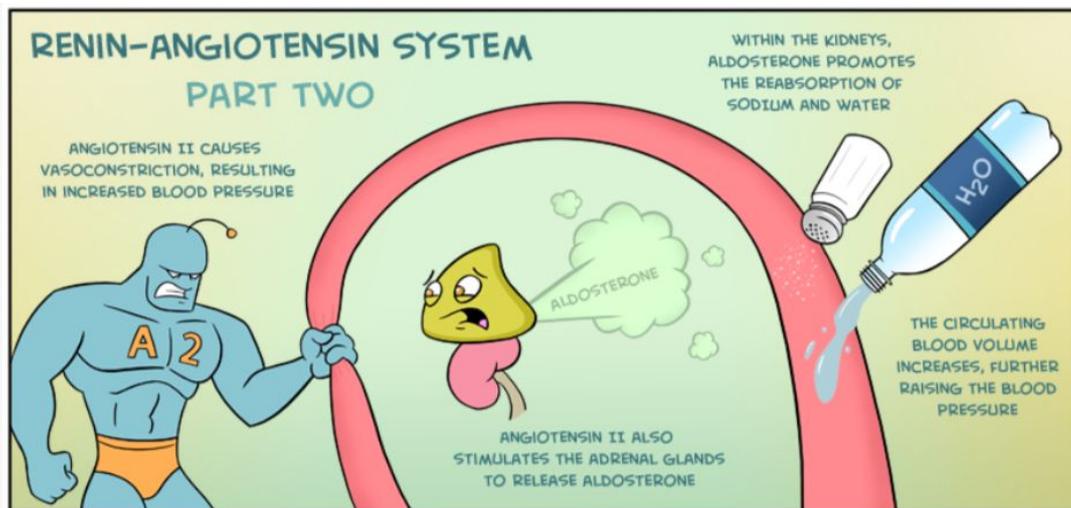
- A. PKD1 has abnormality in receiving a signal or abnormally transmit through the ER.
- B. The polycystin complex regulates the basement membrane integrity and ion channels for Ca²⁺.
- C. Baroreceptors in the granular cells in the preglomerular cells detect drop in blood pressure, granular cells release renin into bloodstream to raise the renal blood pressure.

D. **The young people with ADPKD has decreased systolic BP (false, increase systolic BP due to the obstruction by cysts)**

- E. There is drop in glomerular filtration and renal plasma flow in ADPKD.

6. Which statement is correct?

- A. In people with hypertension, there is normally high renin level (False, when the BP is high, normally the RAS system is suppressed with decreased renin)
- B. In ADPKD, there is abnormally low renin level (false, the renin level is high)
- C. In ADPKD, renin is trying to lower the abnormally high BP (false, renin is driving the high blood pressure)
- D. Renin are found in enlarged juxtaglomerular cells, vessels and cells lining the cyst walls.



7. Which statement is incorrect?

- A. Only RAS system involved in releasing renin (False, sympathetic nervous system also increases renin level. Baroreceptors detect the drop in BP in afferent arterioles, tell juxtaglomerular cells to release renin. Macula densa detect the amount of NaCl passing through the distal convoluted tubule. If NaCl decreases, distal convoluted tubule promote releasing renin)
- B. In ADPKD, cysts obstruct the preglomerular arteries, renal blood pressure drops, detected by Macula densa and baroreceptors which releases renin.