

Role of RAS in Kidney:

- RAAS is a system that is activated in the body by decrease in arterial pressure.
- Upon activation, it produces some responses that tries to increase arterial pressure to normal.

RENIN

- It is an enzyme secreted by juxtaglomerular cells of the kidneys into blood stream.
- It is synthesized as pre-pro hormone known as human pre pro-renin which has little or no biologic activity.
- Pro-renin is converted to renin in kidneys. It can also be secreted by other organs such as ovaries
- The function of renin is to convert angiotensinogen to angiotensin I.

ANGIOTENSINOGEN

- It is synthesized in the liver and removed in endoplasmic reticulum.
- Circulating angiotensinogen can be found in plasma

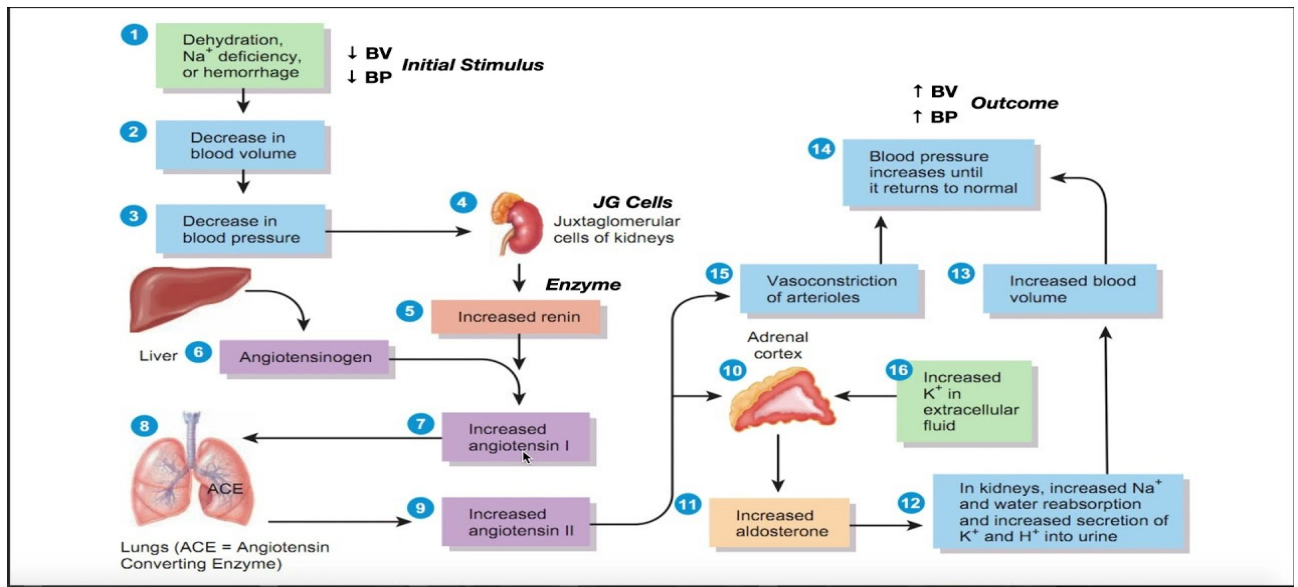
Angiotensin converting enzyme (ACE)

- It is an enzyme that converts Angiotensin I into Angiotensin II.
- Most of the enzyme is located in endothelial cells and much of conversion occurs as blood passes through the lungs.
- Conversion can also occur in other many parts of the body.

MECHANISM OF RAAS

- It is a system that regulates arterial pressure by regulating blood volume. The system is hormonally mediated.
- Reduction in arterial pressure leads to decrease in renal perfusion pressure.

- The decrease in arterial pressure cause pro-renin to be converted to renin
- In plasma renin catalyses conversion of angiotensinogen to angiotensin I as mentioned in earlier slide.
- Angiotensin-I is converted to angiotensin-II in lungs and kidneys- a reaction catalysed by ACE.



FUNCTIONS OF ANGIOTENSIN II

1. Acts on adrenal cortex (zona glomerulosa cells) to stimulate synthesis and secretion of aldosterone.
 - Aldosterone increases sodium ion reabsorption as it acts on principal cells of renal distal tubule and collecting ducts.
 - Water follows sodium reabsorption through osmosis hence increase blood volume.
2. Angiotensin II is a potent vasoconstrictor and acts directly on arterioles to cause vasoconstriction producing increase in total peripheral resistance hence increase in arterial pressure.
3. It also acts on hypothalamus to increase thirst and water intake.
4. Also stimulates secretion of anti-diuretic hormone which increases water reabsorption in collecting ducts.