

When the Sympathetic NS is active, it wants to divert blood to muscles and the heart. It causes vasoconstriction of the kidney arterioles (afferent) to reduce GFR and save water. It stimulates Renin release.

إياك تحفظ تخنيك رافع وفيل لتقنع

Hyper tension

cardia output

systemic vascular resistance

$$\uparrow \text{BP} = \text{CO} \uparrow \times \uparrow \text{SVR} \quad (\text{total peripheral resistance})$$

BV $\uparrow$

(total blood flow)

TPR $\uparrow$

amount of blood

average 5L

$$\text{HR} \uparrow \times \text{SV} \uparrow$$

(beat/min) (vol. ejected/beat)

- blood vessels diameter decrease

vasoconstriction

sympathetic NS (increase HR)

vasoconstriction peripherally بعيد القلب

vasodilation centrally قريب القلب

parasympathetic (decrease HR)

- pre load $\uparrow$

= venous return $\uparrow$

- contractility $\uparrow$

- After load $\uparrow$

Resistance $\uparrow$

- viscosity $\uparrow$

- blood vessels length $\uparrow$

في حال تحفيزهم

(hypervolemia)

(hypertension)

(hypovolemia)

Blood Flow $\uparrow$

BF $\uparrow$ BP $\uparrow$ CO $\uparrow$

نقص

Blood Flow $\downarrow$

BP $\uparrow$ BF $\downarrow$ R $\uparrow$

BF to Kidneys

GFR

reabsorption

secretion

afferent vasoconstriction

Renin

angiotension

aldosterone

Anti diuretic hormone (ADH)

EP/NOR EP

Atrial natriuretic peptide (ANP)

diluted urine

osmolarity

inhibition

blood flow to Kidneys

GFR

reabsorption

secretion

afferent vasoconstriction (Angiotension II)

Renin

angiotension

aldosterone

Anti diuretic hormone (ADH)

EP/NOR EP

Atrial natriuretic peptide (ANP)

Aldosterone

Hypernatremia Na^+ in blood / hypertension

Hypo Kalemia K^+ in blood

important note 8-

- stroke volume (SV) increase
when preload is high $\uparrow$ and
Afterload is low $\downarrow$

but in "Hypertension" BP $\uparrow$

afterload is high $\uparrow$

concentrated urine
osmolality $\uparrow$

Blood flow going back
to systemic circulation $\uparrow$

During severe hypovolemia, the sympathetic system and Angiotensin II will constrict the afferent arterioles, lowering GFR to prevent water loss (though Ang II preferentially constricts the efferent to maintain GFR in mild cases, in severe shock, GFR drops)

By raneem al-syouf