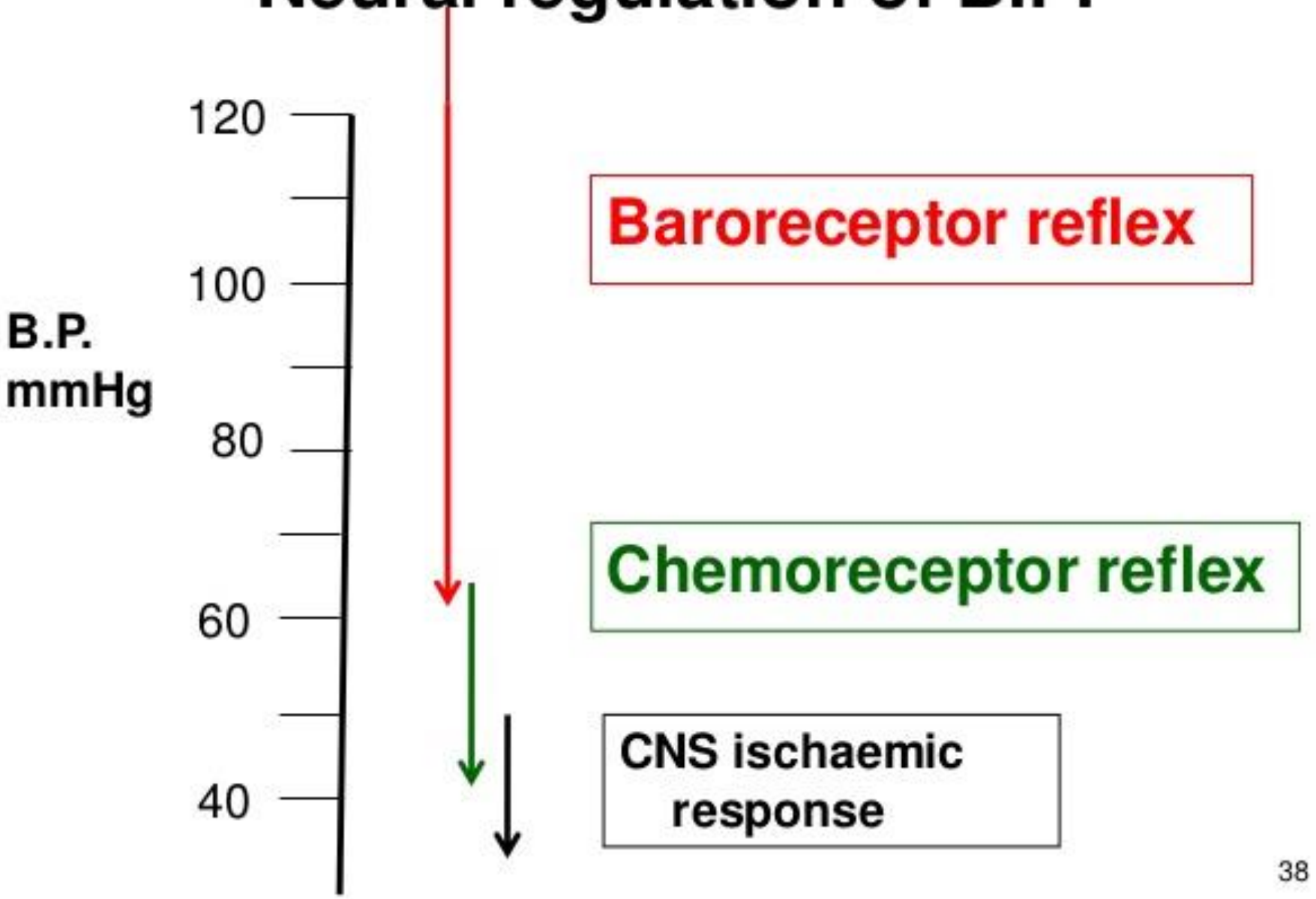
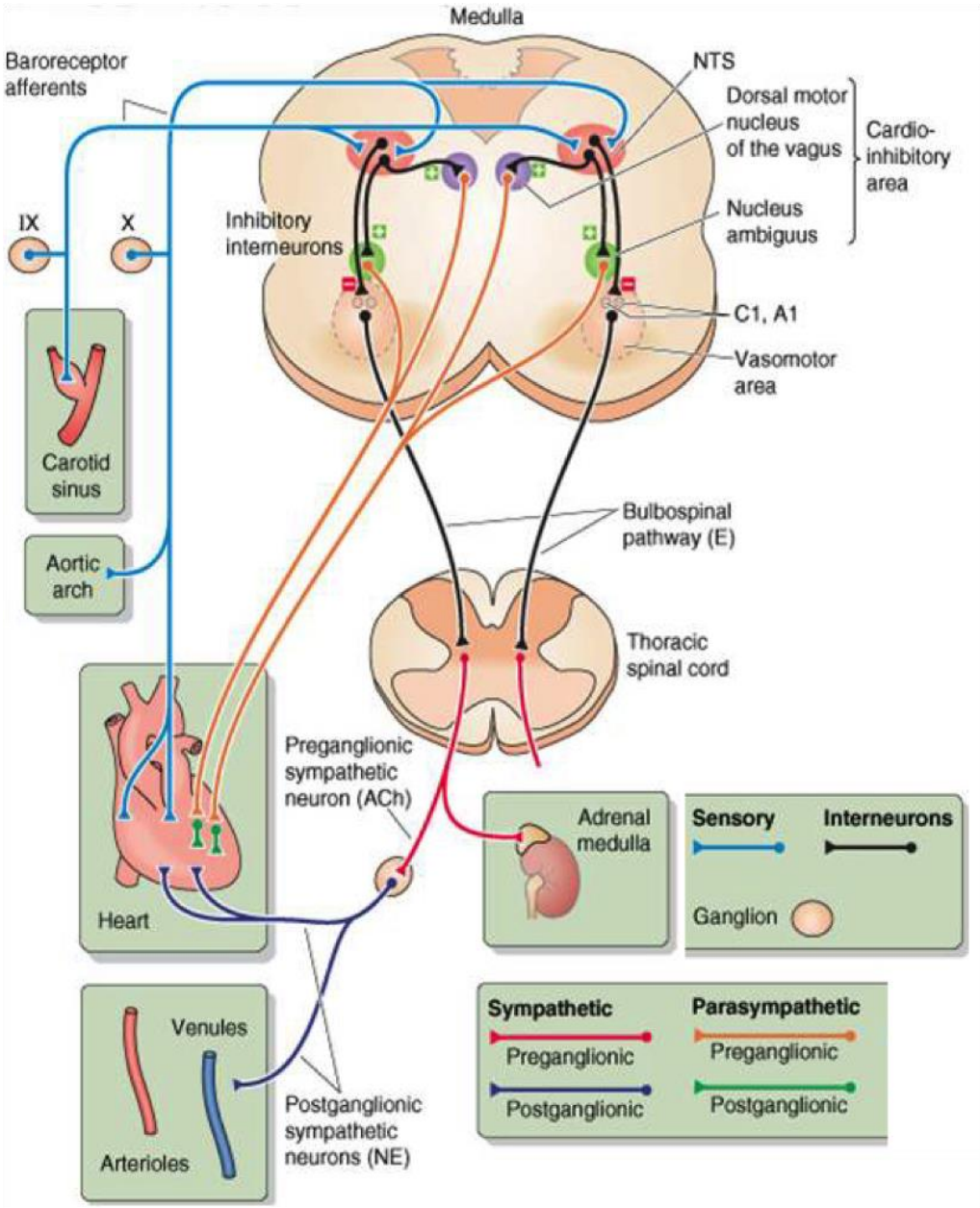
Regulation of BP

Dr. Katek

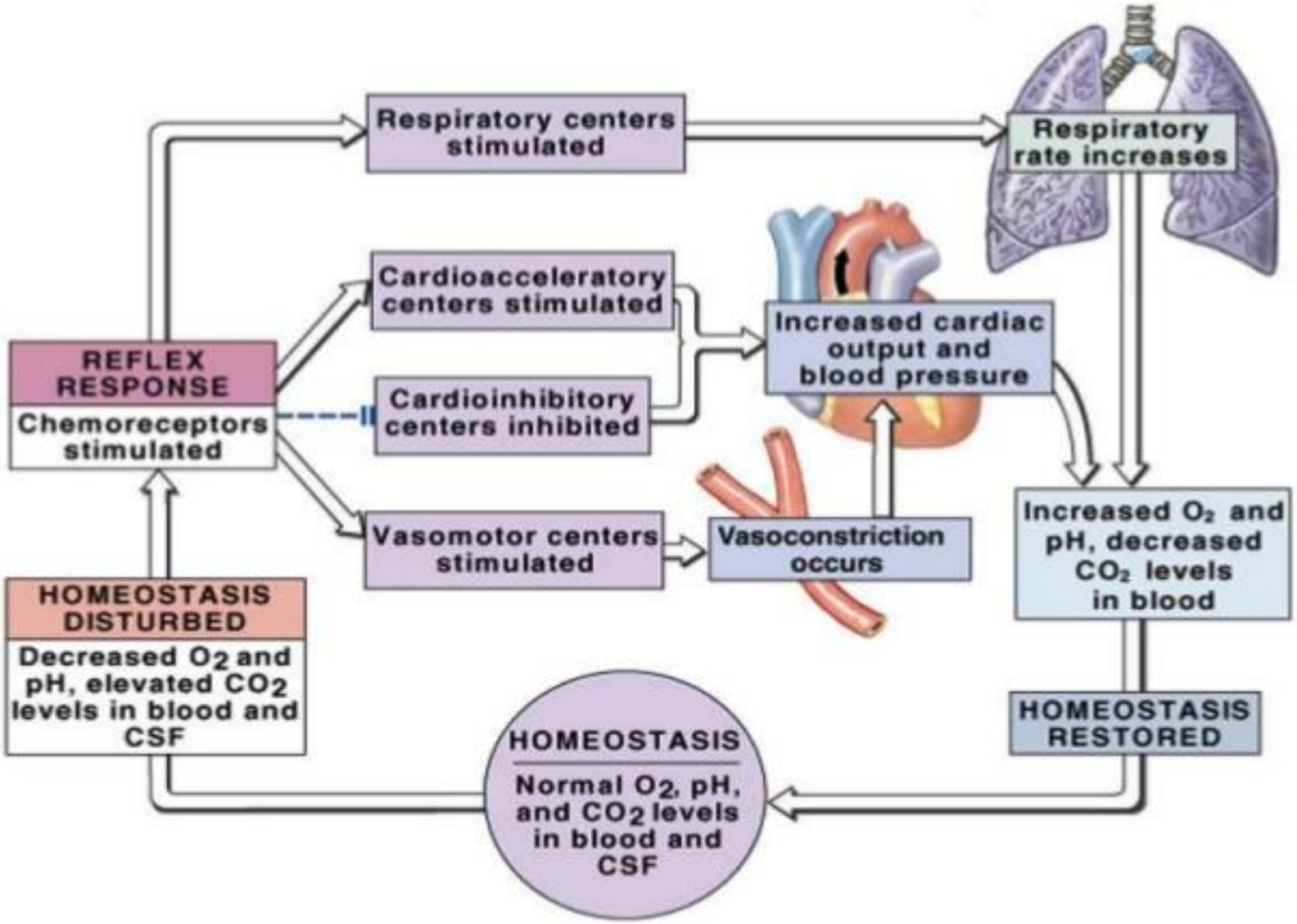
Neural regulation of B.P.



Baroreceptor reflex



Chemoreceptor



CNS Ischemic Response

Severe decrease blood flow to brain

↓

Cerebral hypoxia

↓

Vasomotor center stimulated – causes powerful vasoconstriction
(INCREASE SYMPATHETIC DISCHARGE – Norepinephrine)

↓

Increase blood pressure & blood flow

Capillary fluid shift mechanism

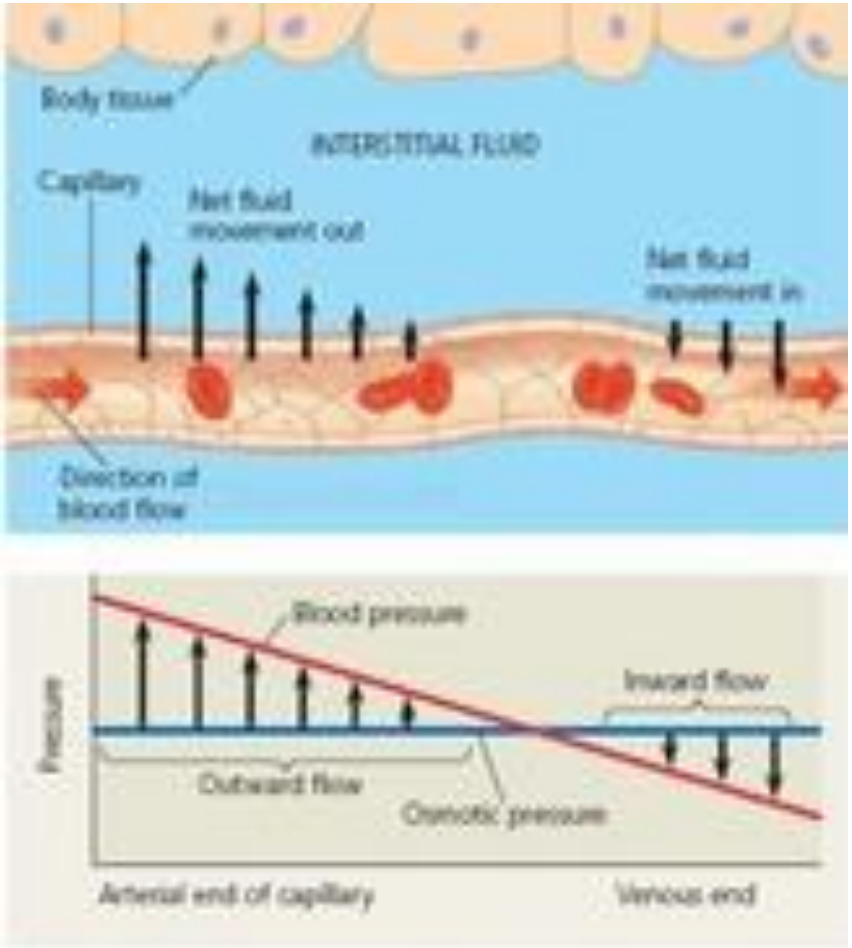
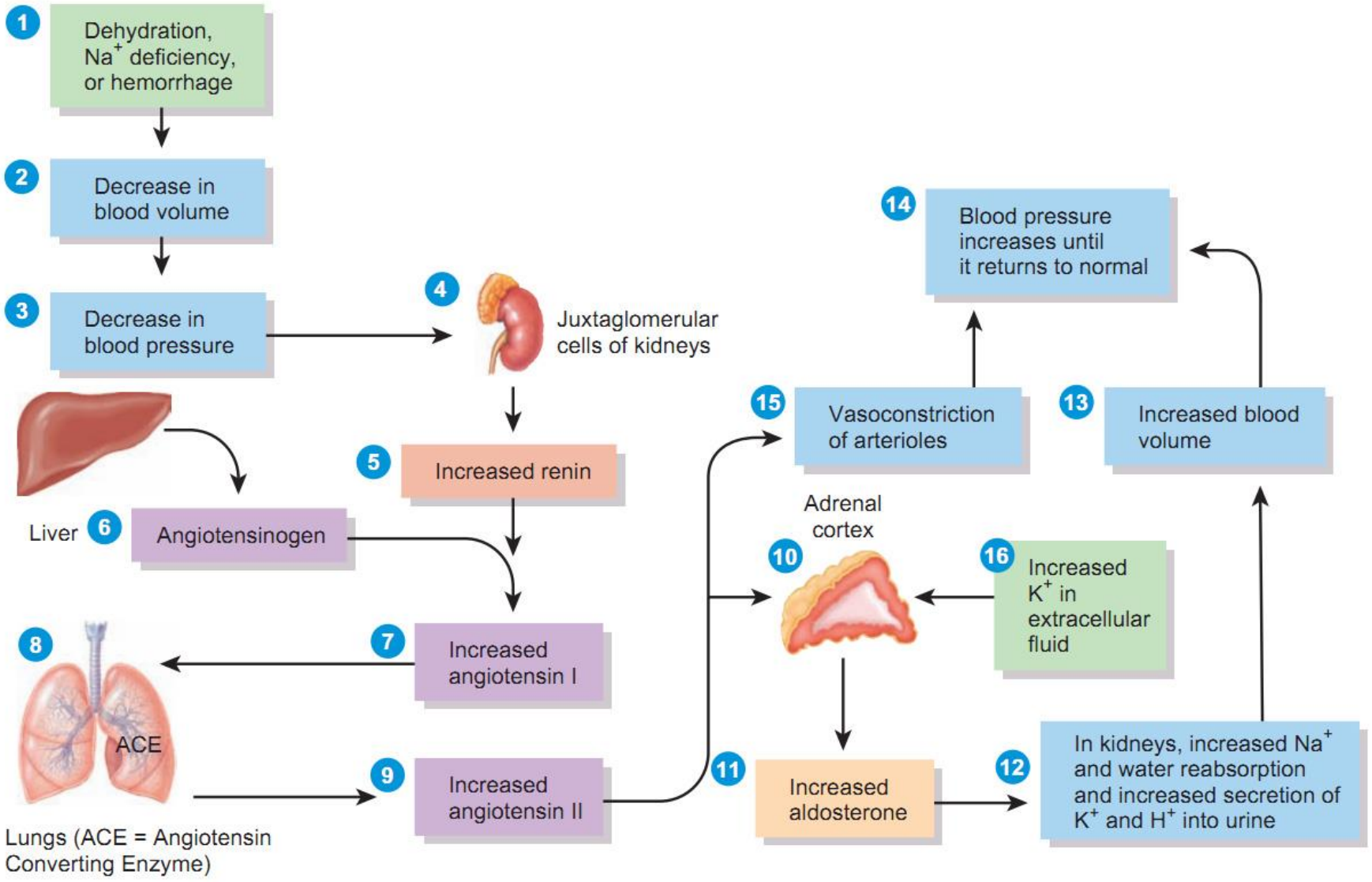


Figure 42.16 Fluid exchange between capillaries and the interstitial fluid. This diagram shows a hypothetical capillary in which osmotic pressure is constant along its length. At the arterial end, where blood pressure exceeds osmotic pressure, fluid flows out of the capillary into the interstitial fluid. At the venous end, the blood pressure is less than osmotic pressure, and fluid flows from the interstitial fluid into the capillary. In many capillaries, blood pressure may be higher or lower than osmotic pressure throughout the entire length of the capillary.

Renin – angiotensin system

Regulation of aldosterone secretion by the renin–angiotensin–aldosterone (RAA) pathway.

Aldosterone helps regulate blood volume, blood pressure, and levels of Na^+, K^+, and H^+ in the blood.



II) **Long-term regulation of the ABP:**

This is a slowly-acting pressure control mechanism called "renal-body fluid-pressure control mechanism".

It includes the hormonal mechanism which acts through the kidney →

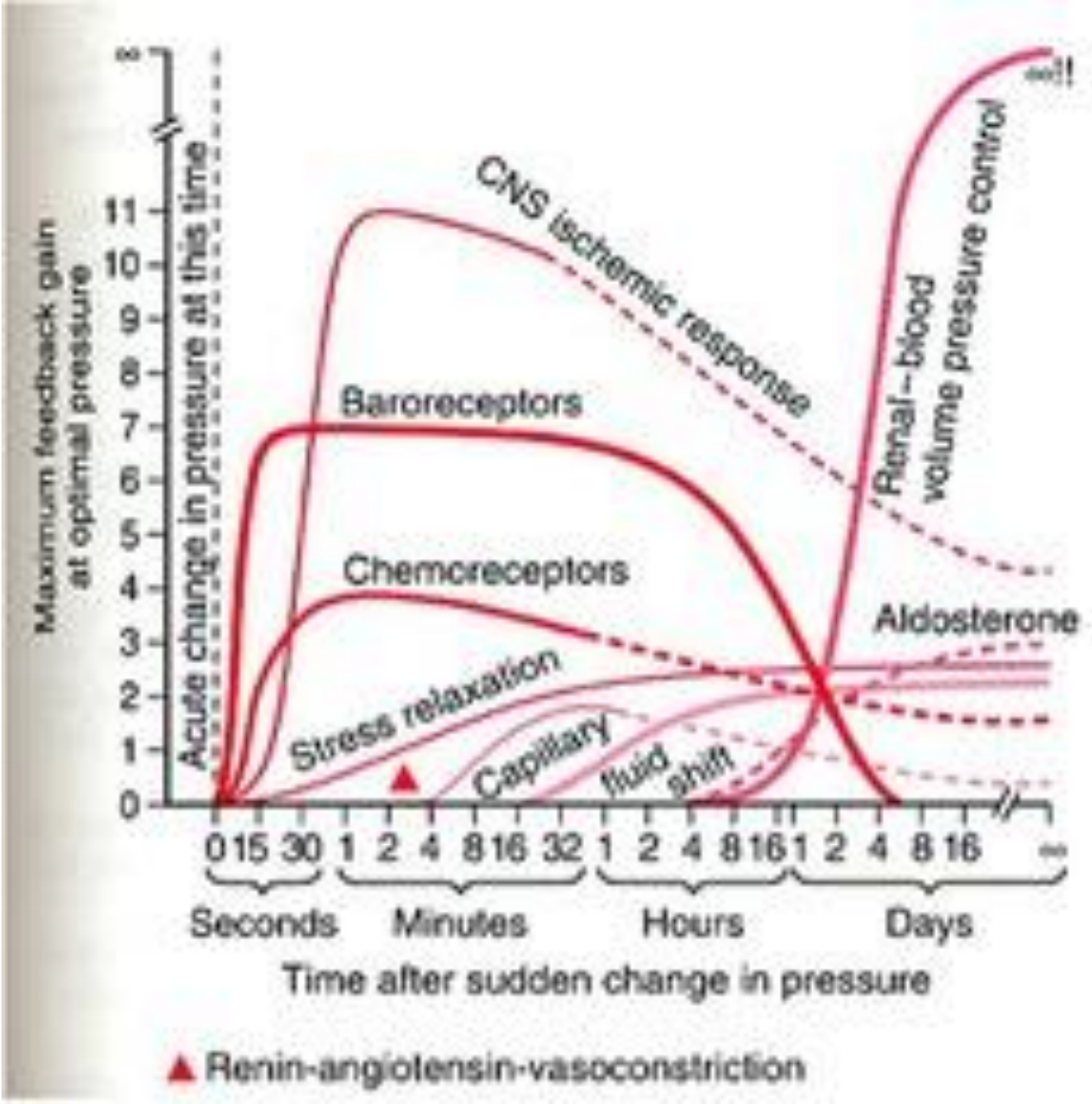
1) **Regulation of extra-cellular fluid (blood volume with its effects on ABP)**
2) **Excretion of water and electrolytes in urine.**

Two hormones are involved in this mechanism:

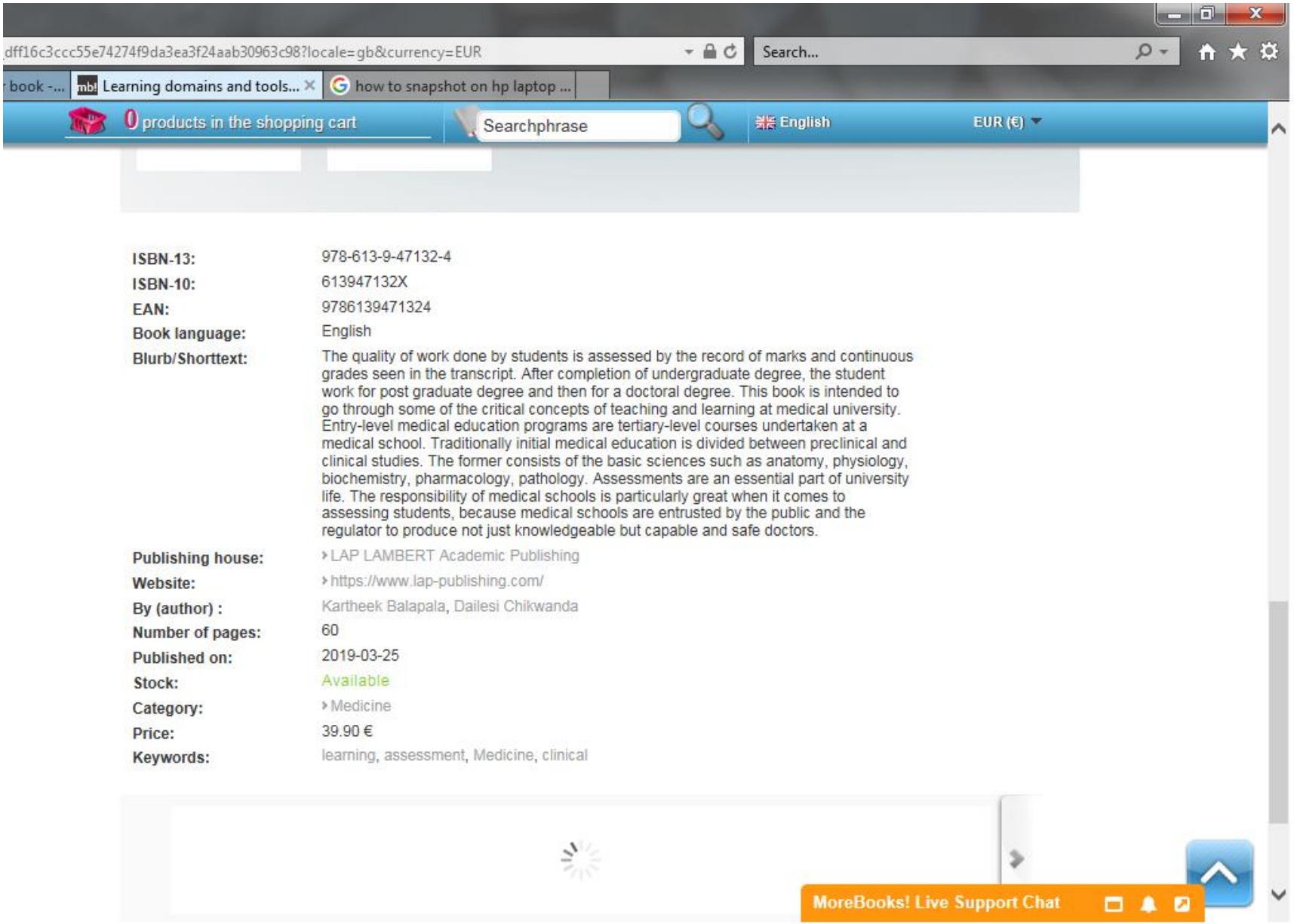
1) **Anti diuretic hormone (ADH) which is secreted from the posterior pituitary and it helps H_2O reabsorption from the renal tubules → ↑ blood volume.**
2) **Aldosterone hormone which is secreted from the suprarenal cortex and it helps Na+ and H_2O reabsorption from the renal tubules → ↑ blood volume**

Renal-Body Fluid System for Arterial Pressure Control

- When the body contains too much extracellular fluid, the blood volume and arterial pressure rise
- Pressure Diuresis and Pressure Natriuresis
- At high pressure, the kidneys excretes the excess volume into urine and relieves the pressure
- At low pressure, the kidney excretes far less fluid than is ingested


Maximum feedback gain at optimal pressure
Acute change in pressure at this time
∞
11
10
9
8
7
6
5
4
3
2
1
0
CNS ischemic response
Baroreceptors
Chemoreceptors
Stress relaxation
Capillary fluid shift
Renal–blood volume pressure control
Aldosterone
0 15 30 1 2 4 8 16 32 1 2 4 8 16 1 2 4 8 16 ∞
Seconds
Minutes
Hours
Days
Time after sudden change in pressure
▲ Renin-angiotensin-vasoconstriction

Book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Blurb/Shorttext: The quality of work done by students is assessed by the record of marks and continuous grades seen in the transcript. After completion of undergraduate degree, the student work for post graduate degree and then for a doctoral degree. This book is intended to go through some of the critical concepts of teaching and learning at medical university. Entry-level medical education programs are tertiary-level courses undertaken at a medical school. Traditionally initial medical education is divided between preclinical and clinical studies. The former consists of the basic sciences such as anatomy, physiology, biochemistry, pharmacology, pathology. Assessments are an essential part of university life. The responsibility of medical schools is particularly great when it comes to assessing students, because medical schools are entrusted by the public and the regulator to produce not just knowledgeable but capable and safe doctors.
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