

Topic of the lesson: ETIOLOGY AND PATHOGENESIS OF ARTERIAL HYPER AND HYPOTENSION

Aim: To learn main regular and specific mechanisms of arterial hyper- and hypotension; to be able to lead the pathophysiological analyze of clinical situations, which are associated with arterial hyper- and hypotension.

Main questions over the topic of the lesson:

1. The definition of “arterial hyper- and hypotension”.
2. The classification of arterial hyper- and hypotension.
3. The comparison characteristics of conception of pathogenesis of the essential arterial hypertension.
4. Stages of the essential arterial hypertension.
5. Mechanisms of development of arterial hypertension complications.
6. Pathogenesis of renovascular and renoprival hypertension.
7. Pathogenesis of arterial hypertension and hyperfunction of hypothalamo-pituitary system of adrenal and thyroid glands.
8. Collapse: characteristic of the definition. Causes and pathogenesis of collapse.

Literature: 1. General and clinical pathophysiology/Gozhenko A.I. - Odessa National Medical University. - 2002. - p. 143-158
2. Pathophysiology/Gozhenko A.I., Gurkalova I.P. - Odessa National Medical University. - 2003. - p. 249-258

CONTROL QUESTIONS

№	Instructions to the execution of the task	Answers of the students with complements at the lessons
1.	Essential hypertension- is	
2.	Secondary hypertension- is	

3.	Name hemodynamic variants of arterial hypertension? a, b, c	
4.	Enumerate experimental models of arterial hypertension: a, b, c, d, e, f, g, h, i	
5.	Enumerate concepts of pathogenesis of the essential hypertension: a, b, c, d	
6.	Enumerate risk factors of the hypertonic disease development- a, b, c, d, e	
7.	Name secondary renal hypertensions a, b	
8.	.Name arterial hypertensions by endocrinopathy of adrenal glands a, b, c	
9.	Name arterial hypertensions by hypothalamo-pituitary system disease a, b	
10.	Enumerate neurogenetic secondary arterial hypertensions a,b	

TASK 1. Fill the table “Classification of arterial hypertension”

According to hemodynamic sign	
According to the type to the stage of increased arterial pressure	
According to clinical features	
According to origin	

TASK 2. Characterize stages of the benign arterial hypertension development

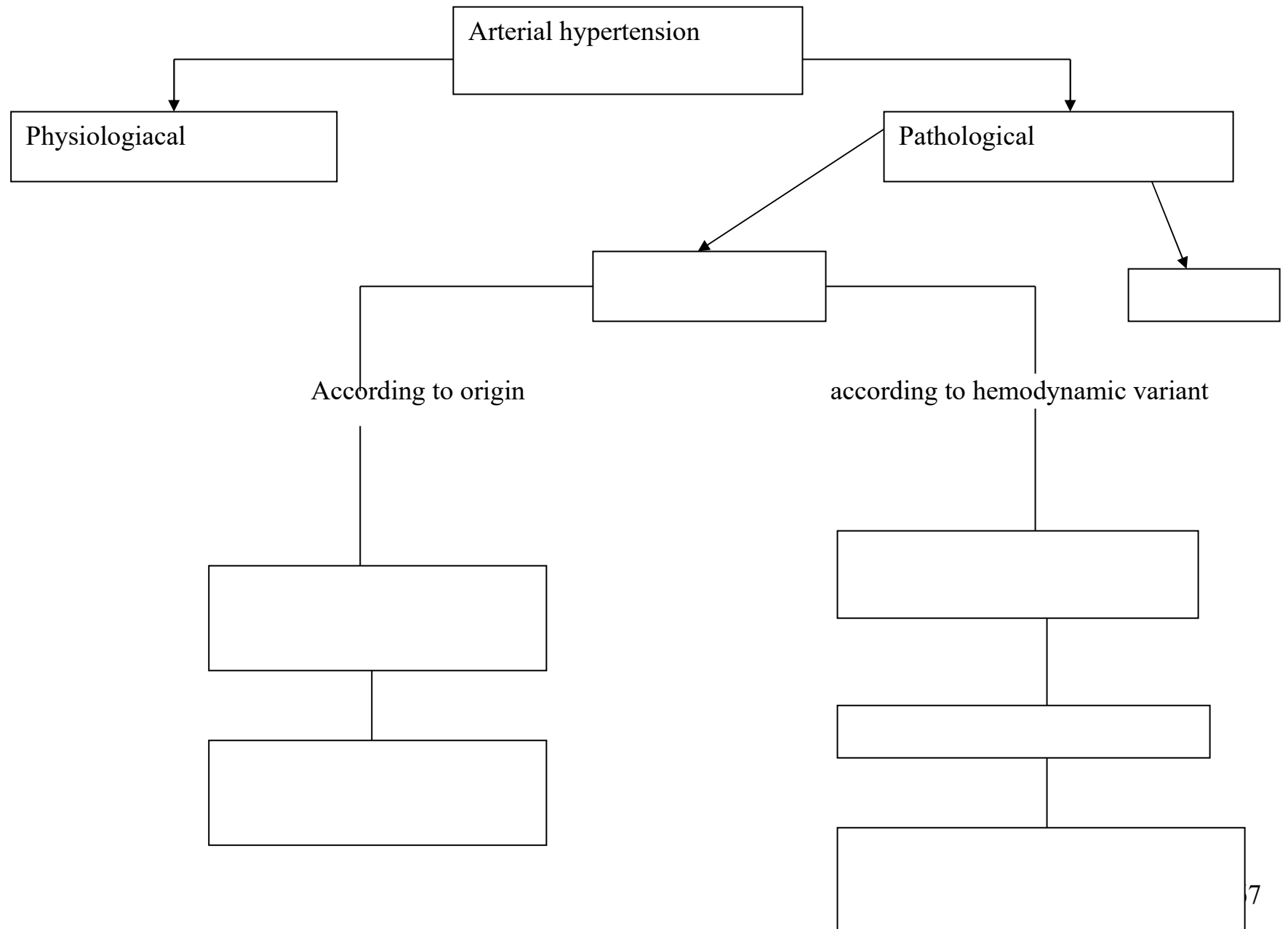
Stages of arterial hypertension	Systolic arterial pressure	Diastolic pressure	Possibility of spontaneous normalization of arterial pressure	Signs of target organ destruction	Presence of complications: cerebrovascular accident, infarction
I stage	160-179 millimeters of mercury	95-104 millimeters of mercury			
II stage	180-200 millimeters of mercury	105-114 millimeters of mercury			
III stage	200-230 millimeters of				

	mercury				
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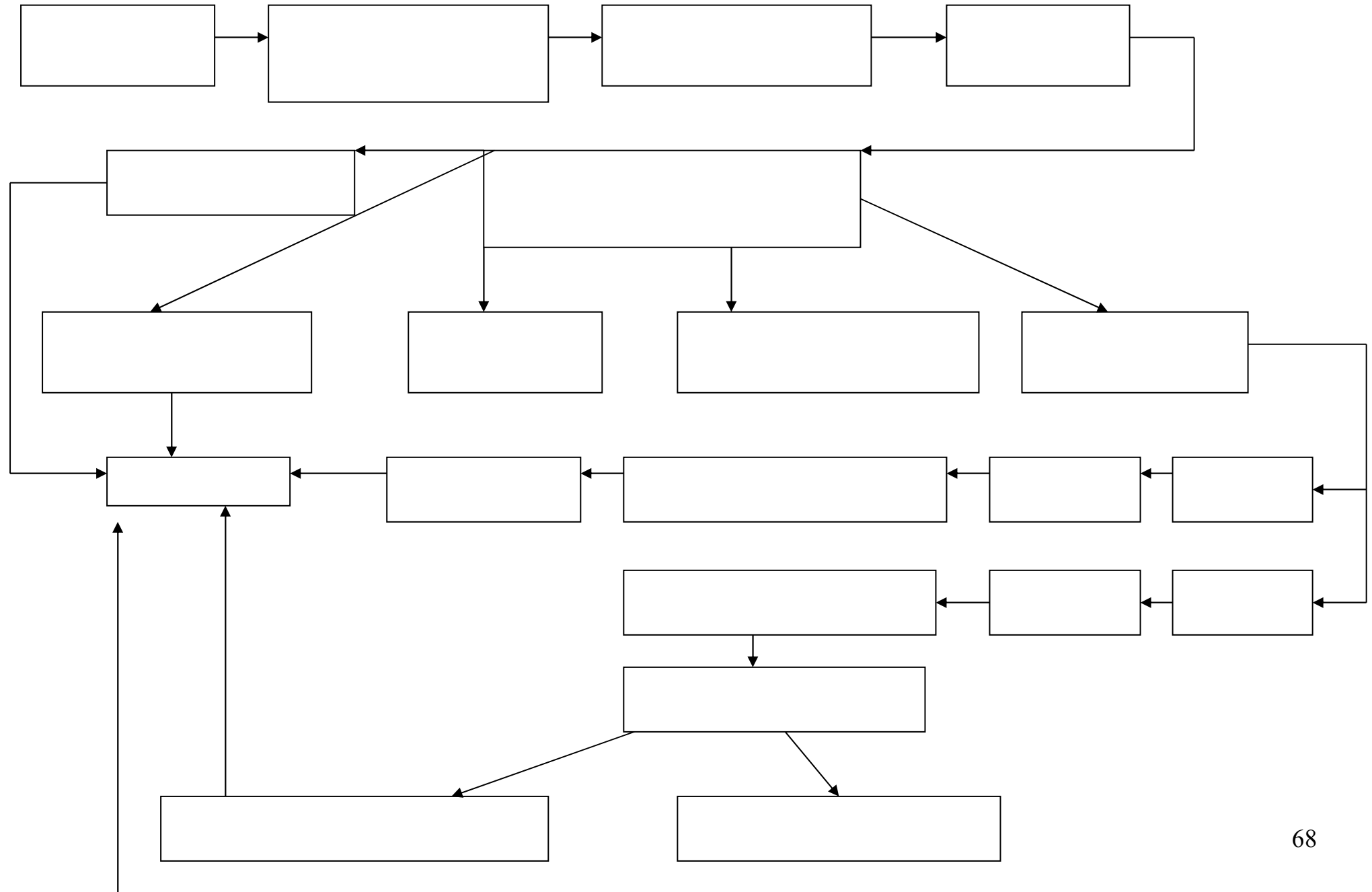
TASK 3. Compare the etiology of two forms of arterial hypertension, mark with + causes of renovascular and renoprival hypertension.

Causes	Renovascular AH	Renoprival AH
1. Compression of magisterial renal arteries (with tumor, scar)		
2. Hydronefrosis		
3. Removing of kidney part		
4. Hypovolemia		
5. Total nephrosclerosis		
6. Compression of renal arterial branches by glomerulonephritis		
7. Stenosis or occlusion of renal arteries with thrombus or embolus		
8. Removing of one or two kidneys		
9. Nephroncrosis		

TASK 4. Fill the scheme of the arterial hypertension classification.



TASK 5. Fill the scheme of the renovascular arterial hypertension pathogenesis.



TASK 6. Compare the type of endocrine pathology and the pathogenetic factors of the secondary arterial hypertension by this pathology

A. Renal and extrarenal effects of the aldosterone excess B. Cardiopathic effect of thyroxin and triiodothyronine excess C. Increase of heart activity and the vasoconstrictive effect of catecholamines D. Increase of blood volume vasoconstrictive effect of the antidiuretic hormone excess E. Termination effect of glucocorticoids against to the vasoconstrictive effect of catecholamines F. Hypofunction of zona fasciculate of adrenal glands G. Hyposecretion of vasopressin H. Hyperproduction of glucocorticoids and mineralocorticoids under the influence of adrenocorticotrophic hormone excess		1. Parhom syndrome 2. Nodose hyperthyreoid goiter 3. Itsenko-Cushing syndrome 4. Hyperplasia of the glomerular zone of renal glands 5. Pheochromocytoma 6. Itsenko-Cushing disease
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TASK 7-9. *To solve clinic-patophysiological tasks.*

Task 1. A 40 year old patient came to the clinic to have examination. He had arterial hypertension with unascertained etiology. Arterial pressure is 175/115 millimeters of mercury. He complains of muscle weakness, headache. On examination: polyuria, hypokaliemia, the 17- oxycorticosteroids corticosteroid in urine.

1. What is cause of arterial pressure increase?

2. Name possible mechanisms of hypertension development, give arguments.

3. What extra examinations would be lead for the confirmation of the diagnose? Name results of these examinations.

Task 2. It has been revealed that a 32 year old man has: arterial pressure 175/115 millimeters of mercury, heart rate- 75. Extra examination revealed that he has the angiospasm of eyeground, microhematuria, albuminuria. On examination: in childhood he had acute diffuse glomerulonephritis.

1. What form of pathology developed? Give the characteristics according to hemodynamic changes.

2. Name possible mechanisms and causes of its development.

Task 3. A patient after the hard physical activity has a sneak attack of fear, muscle tremble, splitting headache, giddiness, and tachycardia. Arterial pressure is 270/165 millimeters of mercury. Two hours later his condition has ameliorated, appeared polyuria. On US and roentgenoscopy of adrenal glands it was revealed a tumor.

1. What tumor of adrenal glands can provoke such set of symptoms?
2. Name possible mechanisms of this pathology development.
3. What extra examinations would be lead for the confirmation of the diagnose? Name results of these examinations.

TASK 10. *To solve the tests of self control*

1. It has been revealed that a patient with a constant arterial hypertension has on the angiography the atherosclerosis of renal arteries. What is the mechanism of arterial hypertension?

- A. increase of vasopressin synthesis
- B. increase of catecholamines level
- C. increase of cortisol secretion
- D. increase of the cardiac output
- E. increase of rennin production

2. A 43 year old man has arterial hypertension as a result of the cardiac output and general peripheral resistance increase. What

hemodynamic variant of its development?

- A. eukinetic
- B. hyperkinetic
- C. hypokinetic
- D. dyskinetic
- E. mixed

3. A 65 year old man has during 15 years arterial hypertension. Last time systolic pressure decreases and diastolic stays on the high level. What hemodynamic type of arterial hypertension has a patient?

- A. hyperkinetic
- B. normokinetic

- C. hypokinetic
- D. eukinetic
- E. dyskinetic

4. It was modeled the arterial hypertension with the cross-clamping of renal arteries of dog. After this operation increased activity of rennin-angiotensin- aldosteronic system. What component of this system has the most pressure effect?

- A. rennin
- B. angiotensin II
- C. angiotensin I
- D. angiotensin III
- E. aldosteron

5. Name the level of arterial pressure that indicative of arterial hypotension. People are 20- 60 years.

- A. 115/80
- B. 100/60
- C. 80/50
- D. 108/70
- E. 105/55

6. Chronic insufficiency of adrenal glands is accompanied with:

- A. arterial hypotension
- B. arterial hypertension
- C. stomach hypersecretion
- D. teratogenic action
- E. stroke

7. A patient after infarction of myocardium has decrease of arterial pressure to 77/40. What is the mechanism of its development by the heart insufficiency?

- A. decrease of minute heart output
- B. loss of water
- C. potassium holding
- D. generalized vasodilation
- E. vasoconstriction of peripheral vessels.

8. It has been revealed that a patient with hypertension has a high concentration of vasopressin in blood. On what organ function influenced this hormone most?

- A. liver
- B. kidneys
- C. heart
- D. lungs
- E. adrenal glands

9. Name the level of arterial pressure that indicative of arterial hypotension. People are 20- 60 years.

- A. 125/75
- B. 135/85
- C. 120/90
- D. 90/60
- E. 160/95

10. On experiment the arterial pressure can be modeled:

- A. two-sided transaction of depressor nerves
- B. constriction of both renal arteries
- C. remove of both kidneys with chronic hemodialysis
- D. constriction of one renal arteria with removing of contrrenal kidney

E. introduction of vasopressin

For notes
