



SMART PHARMACOLOGY

LESSON 6

Task 1

Choose the main kidney functions:

- A. Maintaining overall fluid balance
- B. Regulating and filtering minerals from blood
- C. Filtering waste materials from food, medications, and toxic substances
- D. Creating hormones that help produce red blood cells, promote bone health, and regulate blood pressure
- E. All listed above

Task 2

What is the structural and functional unit of the kidney?

Indicate the main elements of the nephron.

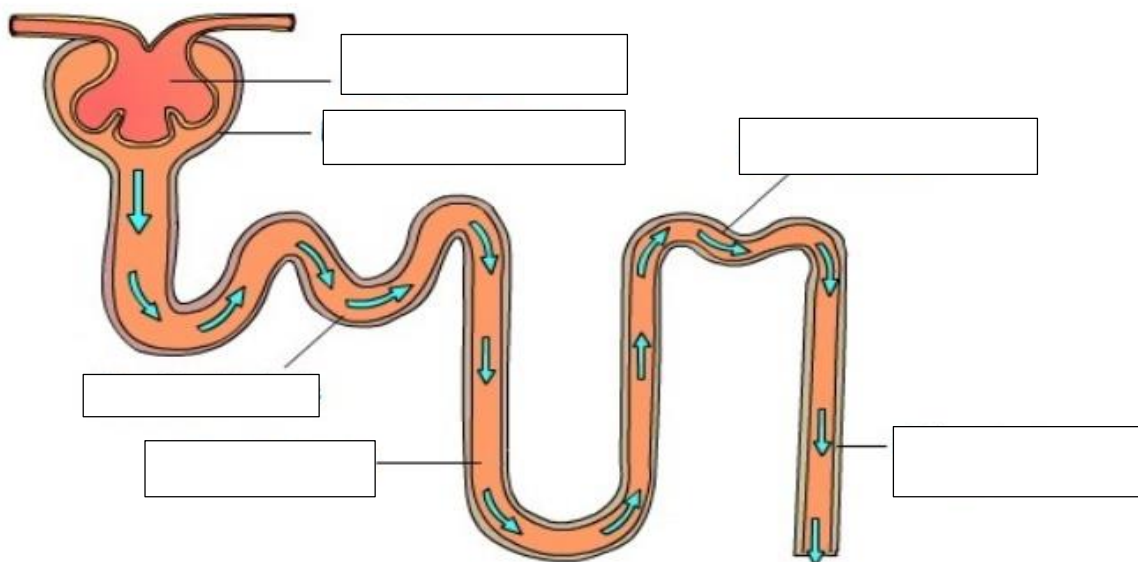


Fig.1 Structure of the nephron

Task 3

Name the four main processes which are involved in the creation of urine, characterize them.

№	Process	Characteristics
1.	Filtration	
2.	Reabsorption	
3.	Secretion	
4.	Excretion	

Task 4

Give the definition of diuretics. What is the main aim of their administration?

Give the classification of diuretics. To do this, refer the following drugs to the appropriate group by the mechanism of action and fill in the table.

Classification	Drugs
Drugs that mainly increase glomerular filtration	
<i>Xanthine's</i>	
<i>Cardiac glycosides</i>	
Drugs that mainly suppress tubular reabsorption	
<i>Inhibitors of the active sodium transport</i>	
<i>Carboanhydrase inhibitors</i>	
<i>Thiazide and thiazide-like diuretics</i>	
<i>Loop diuretics</i>	
<i>Inhibitors of the passive sodium transport</i>	
<i>Osmotic</i>	
<i>Acid-forming</i>	
<i>Potassium-sparing</i>	

Acetazolamide
Ammonium chloride
Bumetanide
Caffeine
Chlortalidone
Digoxin
Digitoxin
Ethacrynic acid
Furosemide

Hydrochlorothiazide
Indapamide
Lantotide
Mannitol
Spironolactone
Theobromine
Theophylline
Torasemide
Triamterene

Task 5

Indicate the correct site of action for each group of diuretics.

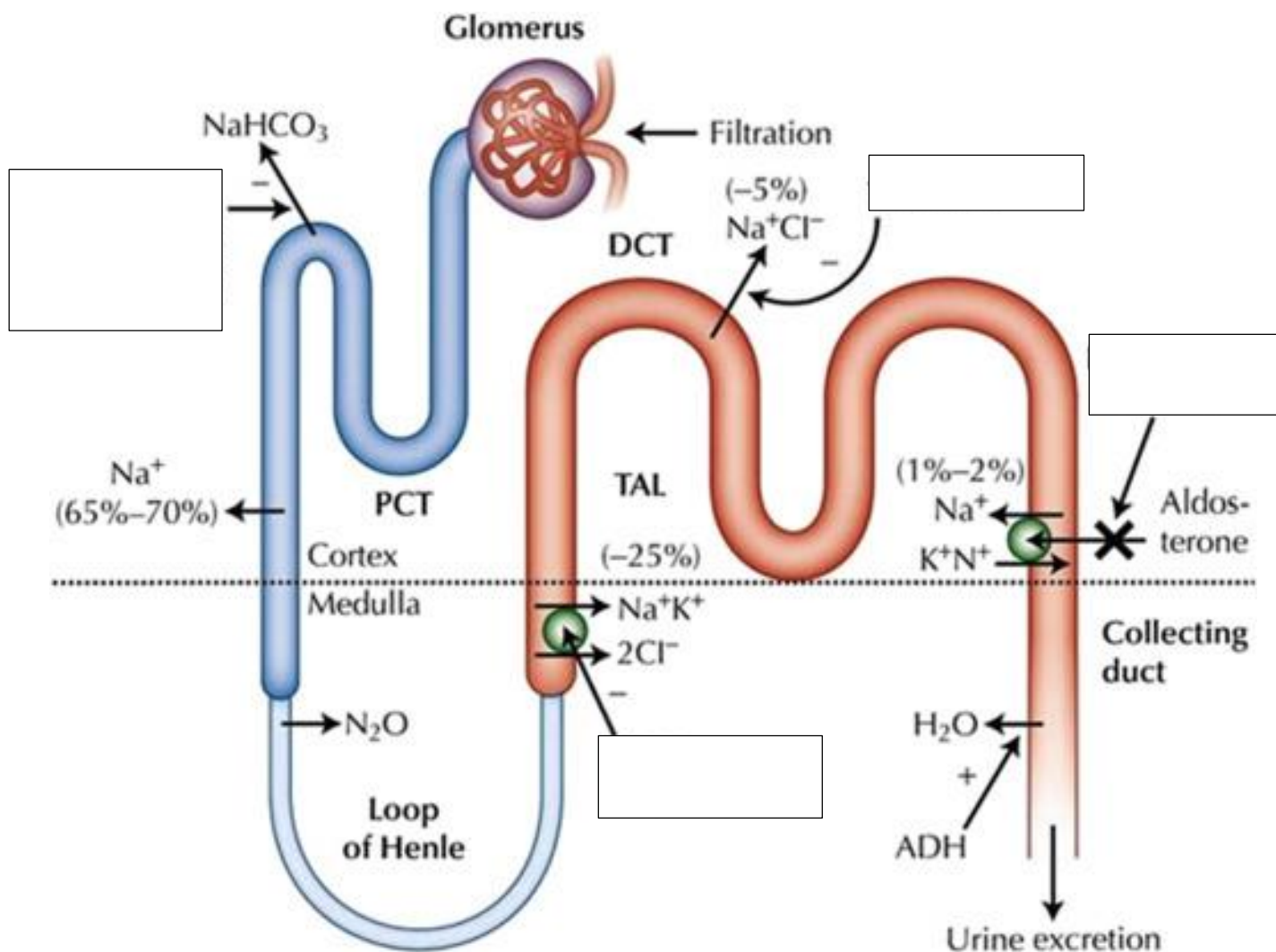


Fig.2 Site of action of diuretics

Task 6

Characterize groups of diuretics. To do this, fill in the table all the necessary information.

No	Group of diuretics	Site of action / Mechanism of action	Indications	Side effects / Contraindications
1.	Carboanhydrase inhibitors			
2.	Thiazide diuretics			
3.	Loop diuretics			
4.	Osmotic			
5.	Potassium-sparing			

Task 7

Fill the table about drug-drug interactions of diuretics and indicate the result of interaction.

Diuretics	Other drugs/groups	Result of interaction
Acetazolamide	sulfonamides and acid-producing diuretics	
Thiazide and loop diuretics	antihypertensive drugs	
Ethacrynic acid and furosemide	aminoglycoside antibiotics	
Potassium-sparing diuretics	ACE inhibitors	
Ethacrynic acid	antitumour drugs	
Diuretics	cardiac glycosides	
Diuretics	NSAIDs	
Diuretics	Euphylline and dopamine	

Task 8

Diuretics are among the first line drugs in the treatment of non-complicated arterial hypertension. Indicate the correct dosage and duration of action for each diuretic in the table.

Hypotensive effect of some diuretics: dosage and duration

Drug	Daily dose, mg	Duration of action, hours
Hydrochlorothiazide		
Indapamide		
Furosemide		
Spirolactone		
Triamteren		

Task 9

Give a definition of the concept of «gout». What are the main causes, symptoms and complications of gout? Name the main approaches to gout treatment.

Task 10

Give the classification of antigout drugs. To do this, refer the following drugs to the appropriate group by the mechanism of action and fill in the table.

Uricodepressive drugs	Uricosuric drugs	Mixed-acting drugs

Allomarone (combined)
 Allopurinol
 Benzobromarone
 Colchicine
 Sulphinpyrasone