

PHARMACOLOGY BRS + KAPLAN
DONE BY: SCIENTIFIC TEAM – HOPE

1. A 35-year-old woman presents to her primary care office for her annual physical examination. She has no complaints. On examination, her blood pressure is slightly elevated at 145/85 mm Hg. She is physically fit and follows a healthy diet. Her doctor prescribed hydrochlorothiazide. What is the mechanism of action of this medication?

- A. Decreases net excretion of chloride, sodium, and potassium
- B. Increases excretion of calcium
- C. Inhibits reabsorption of sodium in the early distal convoluted tubule
- D. Inhibits reabsorption of sodium in the thick ascending limb of the loop of Henle
- E. Interferes with potassium secretion

C

2. A 7-year-old boy is brought to his pediatrician's office by his mother. He complains of sharp pain in his flanks, as well as dysuria and frequency. The doctor orders a 24-hour urine calcium test, and the results are abnormal. After additional work-up, the child is diagnosed with idiopathic hypercalciuria and is started on a new medication. Which of the following medications was most likely prescribed?

- A. Acetazolamide
- B. Furosemide
- C. Hydrochlorothiazide
- D. Mannitol
- E. Spironolactone

C

3. A 45-year-old man with a history of hypertension treated with diuretic therapy presents to his doctor with complaints of a painful, swollen left big toe. Further testing reveals increased uric acid levels. Which of the following medications most likely caused this patient presentation?

- A. Acetazolamide
- B. Amiloride
- C. Hydrochlorothiazide
- D. Mannitol
- E. Spironolactone

C

5. A 66-year-old woman suffers from a myocardial infarction while in the hospital and immediately goes into respiratory distress due to pulmonary edema. Along with the management of the myocardial infarction, the doctor starts her on furosemide therapy. What is the mechanism of action of this agent in treating pulmonary edema?

- A. Alteration of the diffusion of water relative to sodium, thereby reducing sodium reabsorption
- B. Inhibition of action of aldosterone by binding to its receptor in principal cells of the collecting duct
- C. Inhibition of active reabsorption of sodium chloride at the distal convoluted tubule
- D. Inhibition of active reabsorption of sodium chloride at the thick ascending limb of the loop of Henle
- E. Reduction of bicarbonate reabsorption and concomitant sodium uptake

D

6. An 87-year-old woman is admitted to the hospital and started on gentamicin for the treatment of an intra-abdominal infection. After 3 days of therapy, she complains of dizziness and tinnitus. The doctor is concerned about a drug interaction between the gentamicin and one of her medications used for swelling. Which of the following agents was the patient most likely taking?

- A. Ethacrynic acid
- B. Hydrochlorothiazide
- C. Mannitol
- D. Urea
- E. Spironolactone

A

7. A 54-year-old man develops congestive heart failure (CHF) after suffering his second myocardial infarction. His physician starts him on several new medications, including furosemide. At the follow-up examination, the patient is found to have hypokalemia. The addition of which medication may help resolve the hypokalemia and treat the CHF?

- A. Acetazolamide
- B. Allopurinol
- C. Ethacrynic acid
- D. Hydrochlorothiazide
- E. Spironolactone

E

8. A 60-year-old man presents to his family physician for his annual physical. On exam, the patient is hypertensive. Laboratory results show low levels of potassium, high levels of aldosterone, and low levels of renin. The patient is diagnosed with Conn syndrome, or hyperaldosteronism. A computed tomographic (CT) scan of the abdomen reveals bilateral adrenal hyperplasia, which renders the patient inoperable; therefore, he is started on spironolactone. What is the mechanism of action of this agent?

- A. Block the mineralocorticoid receptor in the collecting tubule
- B. Increase cAMP for increased water permeability at the renal tubule
- C. Increase osmolarity of the glomerular filtrate to block tubular reabsorption of water
- D. Inhibit activity of the $\text{Na}^+ / \text{K}^+ / 2\text{Cl}^-$ symporter in the thick ascending limb of the loop of Henle
- E. Inhibit carbonic anhydrase to blunt NaHCO_3 reabsorption in the proximal convoluted tubule

A

9. A 45-year-old woman with a long history of alcohol abuse presents to her physician for the treatment of cirrhosis-associated ascites. She is started on a new diuretic to improve the edema caused by cirrhosis. One month later, the patient returns for a check-up and her blood work shows the following results: Na^+ 136 mEq/L (normal: 136-145 mEq/L) Bicarbonate 23 mEq/L (normal: 22-28 mEq/L) K^+ 5.2 mEq/L (normal: 3.5-5.0 mEq/L) Ca^{2+} 9.9 mg/dL (normal: 8.5-10.5 mg/dL) Uric acid 5.2 mg/dL (normal: 3.0-8.2 mg/dL) Which of the following medications was most likely prescribed to the patient?

- A. Acetazolamide
- B. Amiloride
- C. Furosemide
- D. Hydrochlorothiazide
- E. Torsemide

B

10. A 57-year-old man develops progressive vision loss with a sensation of pressure behind his eyes. The ophthalmologist diagnoses the patient with glaucoma. To prevent further progression of the disease and to alleviate current symptoms, the physician starts the patient on acetazolamide therapy. What is the mechanism of action of this medication?

- A. Increases excretion of hydrogen
- B. Increases rate of formation of bicarbonate in the aqueous humor
- C. Increases uptake of sodium in the proximal tubule
- D. Inhibits carbonic anhydrase in all parts of the body
- E. Reduces reabsorption of bicarbonate

D

11. A 50-year man with mild hypertension presents to his physician with complaints of discomfort in his chest. He has slightly enlarged fat deposits in his breasts with prominent nipples. Which of the following medications most likely caused this patient presentation?

- A. Acetazolamide
- B. Amiloride
- C. Hydrochlorothiazide
- D. Metolazone
- E. Spironolactone

E

12. A 56-year-old man was admitted to the hospital for worsening of his congestive heart failure; diuretic therapy is needed for the treatment of edema. The patient has a history of anaphylaxis to trimethoprim/ sulfamethoxazole. What would be the most appropriate diuretic agent to prescribe?

- A. Acetazolamide
- B. Bumetanide
- C. Chlorthalidone
- D. Ethacrynic acid
- E. Torsemide

D

13. Which side effect is associated with spironolactone?

- A. Alkalosis
- B. Hirsutism
- C. Hyperkalemia
- D. Hypercalcemia
- E. Hyperglycemia

C

14. Sildenafil has been prescribed for years to treat erectile dysfunction. Recently, this drug is also being used for what condition?

- A. vasospastic angine
- B. supraventricular tachycardia
- C. cyanide poisoning
- D. Raynaud disease
- E. pulmonary hypertension

E

15. A new diuretic is being studied in human volunteers. Compared with placebo, the new drug increases urine volume, increases urinary Ca^{2+} , increases plasma pH, and decreases serum K^+ . If this new drug has a similar mechanism of action to an established diuretic, it probably

- A. blocks the NaCl cotransporter in the DCT
- B. blocks aldosterone receptors in the CT
- C. inhibits carbonic anhydrase in the PCT
- D. inhibits the $\text{Na}^+/\text{K}^+/\text{2Cl}^-$ cotra

D

16. Which one of the following drugs is most likely to block K^+ channels in the heart responsible for cardiac repolarization, and also blocks calcium channels in the AV node?

- A. Amiodarone
- B. Quinidine
- C. Lidocaine
- D. Sotalol
- E. Verapamil

A