

1. In a patient with severe renal artery stenosis (narrowing), all of the following would be expected to be increased above normal except

- A. plasma renin concentration
- B. plasma angiotensin II concentration
- C. blood pressure (hydrostatic pressure) in the glomerular capillaries
- D. resistance to blood flow in the efferent arteriole
- E. systemic arterial blood pressure

2. Administration of an Angiotensin Converting Enzyme inhibitor (ACE inhibitor) to the above patient might lead to acute renal failure by

- A. inhibiting renal tubule potassium reabsorption
- B. increasing renal resistance to blood flow
- C. causing plasma proteins to be excreted in the urine
- D. causing systemic arterial hypertension
- E. reducing glomerular filtration rate

3. Which of the following is the stimulus for increased secretion of atrial natriuretic peptide (ANP)?

- A. increase blood plasma osmolality above normal
- B. decrease blood plasma osmolality below normal
- C. increase systemic arterial pressure
- D. increase venous blood volume and atrial pressure
- E. increase cardiac contractility (force of contraction)

4. An increase secretion of renin would be expected to have what effect on sodium excretion and potassium excretion in urine?

- A. increase in Na⁺ excretion and increase K⁺ excretion
- B. increase in Na⁺ excretion and decrease K⁺ excretion
- C. decrease in Na⁺ excretion and increase K⁺ excretion
- D. decrease in Na⁺ excretion and decrease K⁺ excretion
- E. decrease in Na⁺ excretion but no effect on K⁺ excretion

ANSWERS

1. C. Blood flowing through the stenosis will encounter a high resistance, which will cause the pressure to drop on the downstream side of the stenotic area. This will lead to secretion of renin, which causes blood angiotensin II to increase, which will raise systemic arterial blood pressure and constrict the renal efferent arteriole. However, blood pressure in the glomerular capillaries will fall because of the drop in pressure as blood enters the glomerular vessels.

2. E. The ACE inhibitor will reduce angiotensin II concentration, so arterial blood pressure will drop, which reduce glomerular capillary hydrostatic pressure and filtration.

3. D.

4. C. Increase renin will eventually result in a rise in aldosterone, which increases Na-K pumping (antiport) in the renal distal tubule and collecting duct. Thus, Na reabsorption will increase (reduce excretion) and K secretion will increase (increase excretion).