Fluid, Electrolyte, and Acid-Base Balance: Water Homeostasis

1. Below are listed the four examples of disturbances in water homeostasis. Indicate if there is an increase (↑), decrease (↓), or no change (↔) in volume and osmolarity. Give an example of each.

Disturbance	**Volume**	**Osmolarity**	**Example**
Hypervolemia			
Hypovolemia			
Overhydration			
Dehydration			

2. What are the four primary mechanisms to regulate fluid homeostasis?

   a.

   b.

   c.

   d.

3. Answer the following questions on antidiuretic hormone (ADH):

   a. What is the major stimulus? _____

   b. What is the direct effect of the hormone? _____

   c. What effect will this have on plasma volume and osmolarity? _____

   d. What effect will this have on urine volume and osmolarity? _____

4. List three ways dehydration leads to increased thirst:

   a.

   b.

   c.

5. Answer the following questions on the Renin-Angiotensin-Aldosterone System.

   a. What enzyme is released from the kidney in response to decreased

   blood pressure? _____

b. What enzyme converts angiotensin I to angiotensin II? _____

c. What are two effects of angiotensin II?

d. How does aldosterone cause more sodium to be reabsorbed in the kidney?

e. As a result, what happens to blood volume and blood pressure? _____

6. a. A decrease in blood volume and blood pressure will lead to a/an

_____ in the sympathetic nervous system (SNS).

b. This will result in a decrease (↓), and increase (↑), or no change (↔) in the following:

1. _____ Afferent arteriolar constriction
2. _____ Blood flow to the glomerulus
3. _____ Urine loss
4. _____ Renin release

7. a. Diabetes insipidus is due to _____.

b. What will happen to the following:

1. _____ Urine output
2. _____ Plasma sodium
3. _____ Plasma osmolarity
4. _____ Thirst