3.4.4 Water Balance Notes

Antidiuretic Hormone (ADH):
- Released by the pituitary
- Controls the reabsorption of water through the kidney tubules
- When there is not enough water, it affects the tubules so more water is absorbed in the blood
- Released until the water level is normal
- Negative feedback loop
- When there is a lot of water in the blood, there is less ADH released until the water level goes back to normal

Effects of Alcohol:
- Decreases the amount of ADH being produced
- Causes urine to be more dilute
- More urine is produced
- Can lead to dehydration

Bill’s Symptoms:
Alcohol affects ADH by slowing it’s production. This was affecting Bill because the alcohol in his system was causing a lot of urine to be produced, which is why he kept having to go to the bathroom.

Aldosterone:
- Acts on the distal tubules and collecting ducts of the nephron
- Increases reabsorption of water and ions in the kidney
- Conserves sodium, releases potassium, increases blood pressure and retains water
- Released by adrenal gland

Kidney Questions:
- The kidney produces Erythropoietin (EPO), calcitriol, and renin. EPO helps with the production of red blood cells, Calcitriol is the active form of vitamin D, which helps the absorption of calcium in the bones, and renin acts on antigentinosen which breaks off a piece containing 10 amino acids, which leads to an increase in blood pressure. These hormones also help regulate the cardiovascular system because it helps increase the amount of red blood cells.
- The urinary system help the body deal with an influx in alcohol because it filters all of the dilute urine along with the chemicals from alcohol out of the body. Also, the nervous system helps the body deal with the influx of alcohol because the brain receives messages to tell the hypothalamus to secrete ADH to increase water reabsorption in the blood.
Conclusion Questions

1. ADH levels would be higher in a person who just completed a run without any water because ADH is secreted when the body is dehydrated, and the person would be very dehydrated after that long a run without water.

2. The ADH feedback loop is an example of negative feedback loop because it is a continuous process working in both directions to keep the body in homeostasis.

3. After Bill drank alcohol, his body had to release ADH more frequently than normal because alcohol causes the body to become dehydrated, and consequently the body had the work harder to maintain water balance.