

## Kidneys & Drugs

Diuretics are used to treat disorders such as hypertension (high blood pressure) and several types of edema (swelling) that are caused by conditions such as heart failure and cirrhosis of the liver. However, use of diuretics can lead to complications, including dehydration and electrolyte imbalances.



Inhibitors of sodium ion reabsorption include thiazide-type diuretics. They promote the loss of sodium ions, chloride ions, and water in urine. These diuretics are given to some people who have hypertension. Inhibitors of sodium ion reabsorption specifically inhibit transport in the ascending limb of the loop of Henle. These diuretics are frequently used to treat congestive heart failure, cirrhosis of the liver, and renal disease.

1. What does it mean to inhibit the transport of sodium ions in the loop of Henle? (ie how are they normally transported? Where to/from?)
2. Explain how this inhibition of sodium ions in the loop of Henle could help increase urine production.
3. How will increased urine production help treat hypertension (high blood pressure) and edema?
4. What symptoms might someone experience if they have dehydration due to these medications?

Alcohol acts as a diuretic, although it is not used clinically for that purpose. It inhibits ADH secretion from the posterior pituitary and results in increased urine volume.

5. How can an understanding of alcohol's effects on the nephron be used to explain many of the symptoms of a hangover due to over consumption of alcohol? (*headache, thirst, fatigue, rapid heartbeat, memory loss...*)



Xanthines, including caffeine, act as diuretics, partly because they increase renal blood flow and the rate of glomerular filtrate formation. They also influence the nephron by decreasing sodium and chloride reabsorption. Caffeine also inhibits the release of ADH.

6. How does increasing renal blood flow result in increased urine formation?
7. Why would caffeine in the blood cause a decrease in ADH release?
8. Why can it be said that caffeine affects the nephron twice in terms of limiting water reabsorption from the nephron?

