

Kidneys & Water Balance



Kidneys filter about half a cup of filtrate from the blood each **minute**.

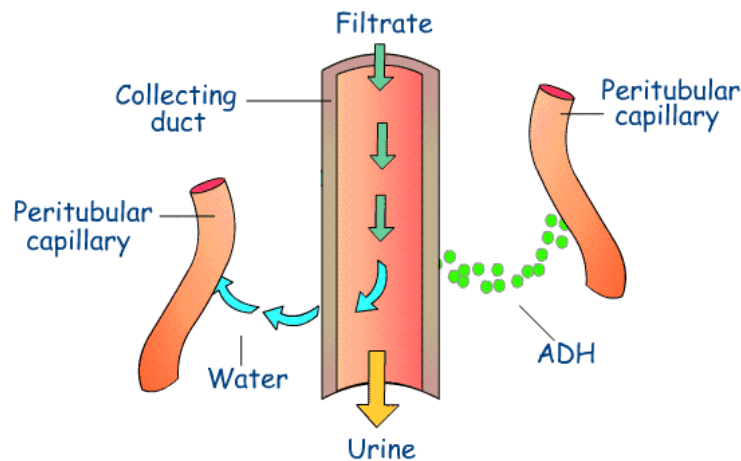
Without reabsorption of water, you would produce about **190L** of urine each day!

You usually urinate about **1 L** each day.

Water reabsorption occurs passively by osmosis

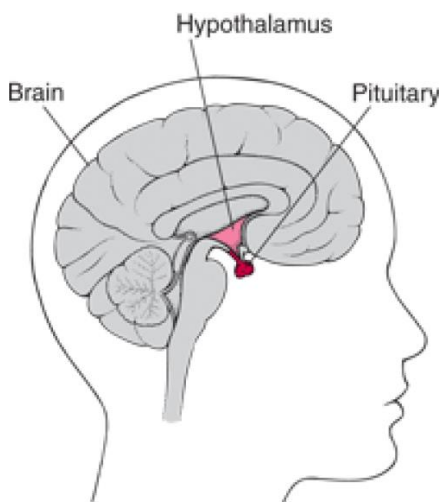
ADH

Water conservation by the kidney is controlled by a negative feedback mechanism, which involves a hormone called antidiuretic hormone (ADH). This is also sometimes called vasopressin.



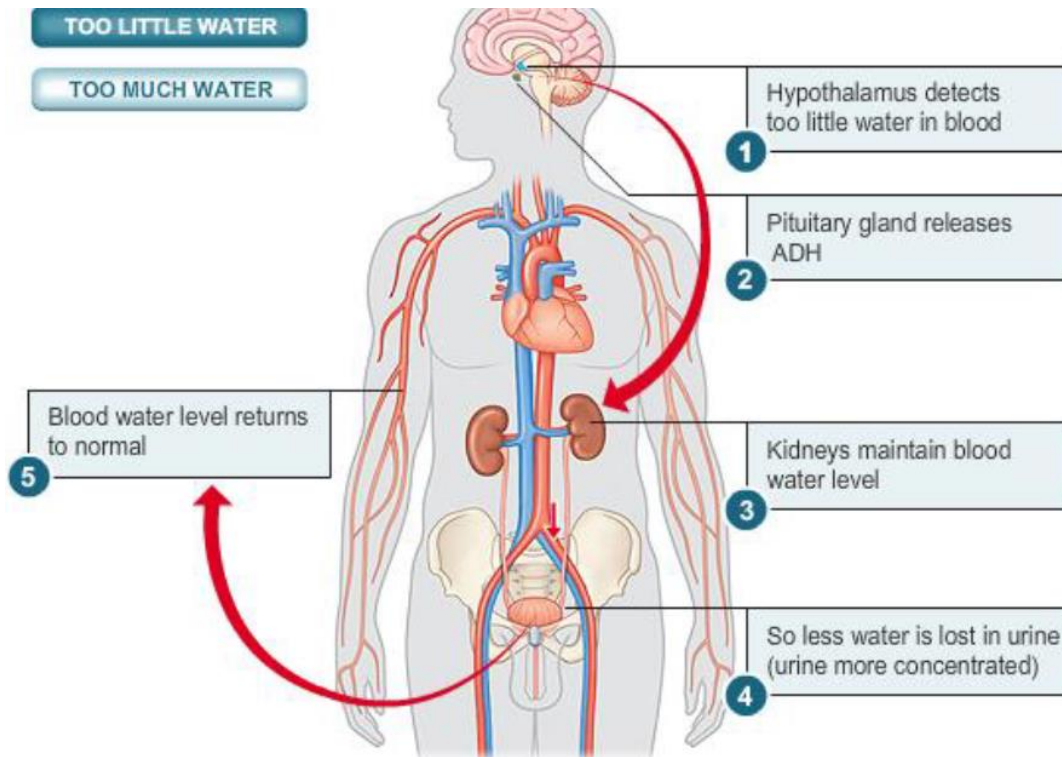
Low water levels in the blood signals the body to produce ADH.

This hormone increases the permeability of the distal tubule and collecting duct to water.



ADH is produced by the hypothalamus and is released by the pituitary gland in the brain

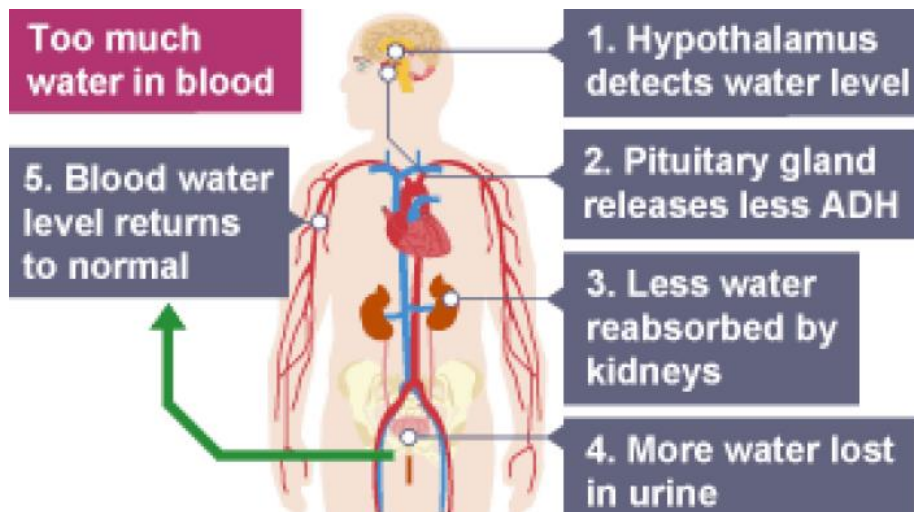
TOO LITTLE WATER:



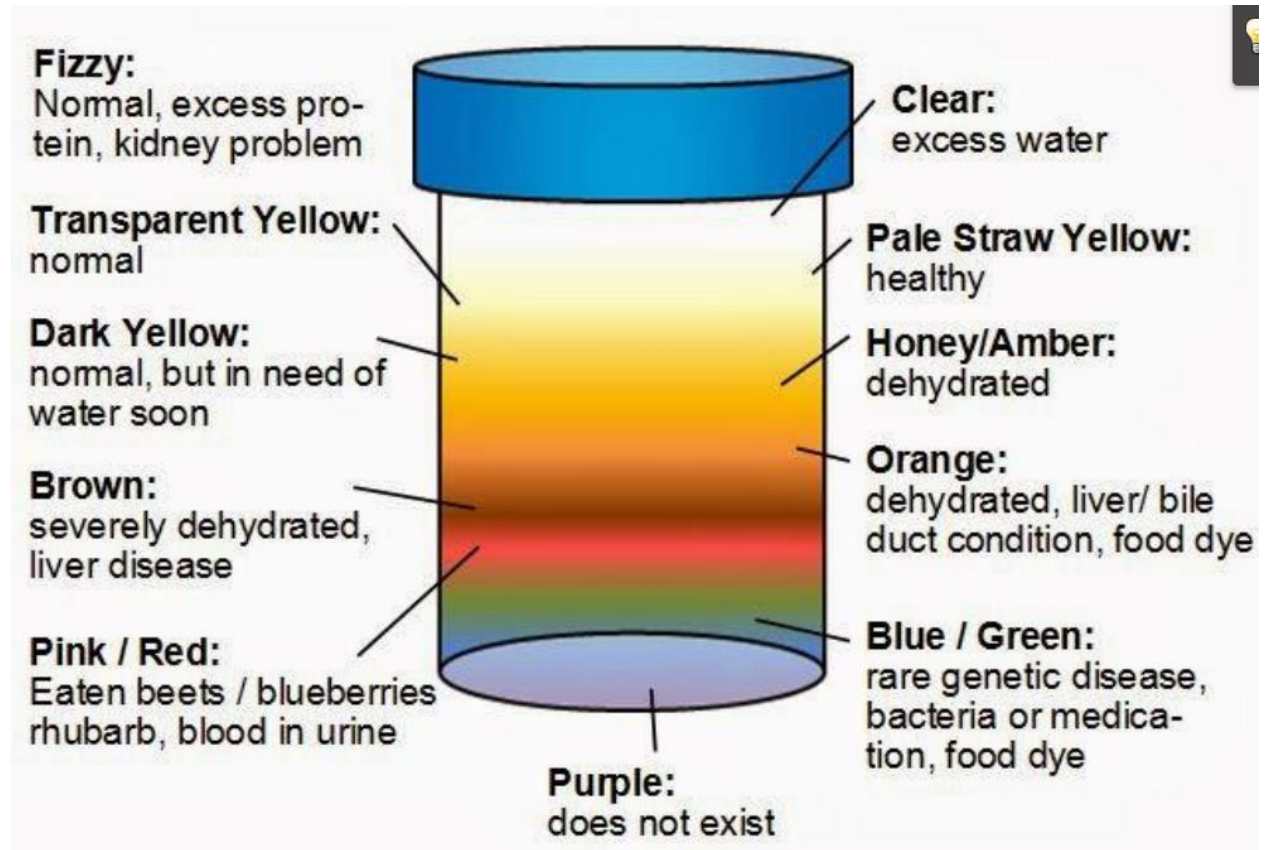
High water levels in the blood signal the body to stop producing ADH

- The cell membranes of the distal tubule and the collecting duct become impermeable to water
- As a result, they do not allow water to return to the blood...urine becomes very dilute.

TOO MUCH WATER:



WHAT DOES THE COLOR OF YOUR URINE MEAN?



FACTORS THAT INFLUENCE ADH

Alcohol inhibits the production of ADH

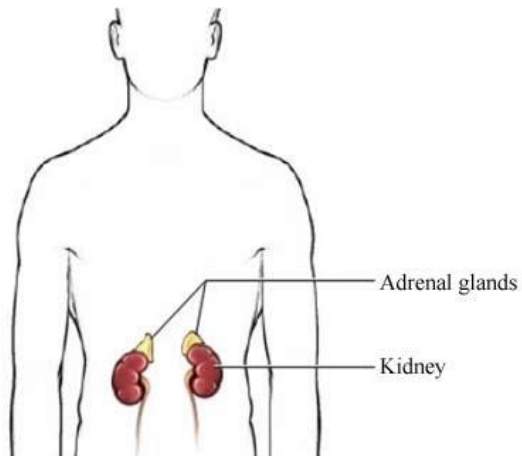


Caffeine increases the rate of salt and water loss from the kidneys.

Caffeine is classified as a diuretic, which means that it increases urine output.

Caffeine increases glomerular blood pressure, which increases blood filtration, resulting in an increase in urine

KIDNEYS & BLOOD PRESSURE

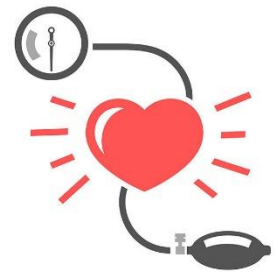


A hormone called aldosterone, which is produced in the adrenal gland (located on top of the kidneys) acts on the nephrons to increase the reabsorption of water and sodium.

The increased sodium and water reabsorption from the distal tubule reduces urine output and increases blood volume

The increased blood volume helps stretch the heart muscle.

This causes the heart to generate more pressure with each beat, thereby increasing the blood pressure.



BLOOD PRESSURE CAN LEAD TO...

