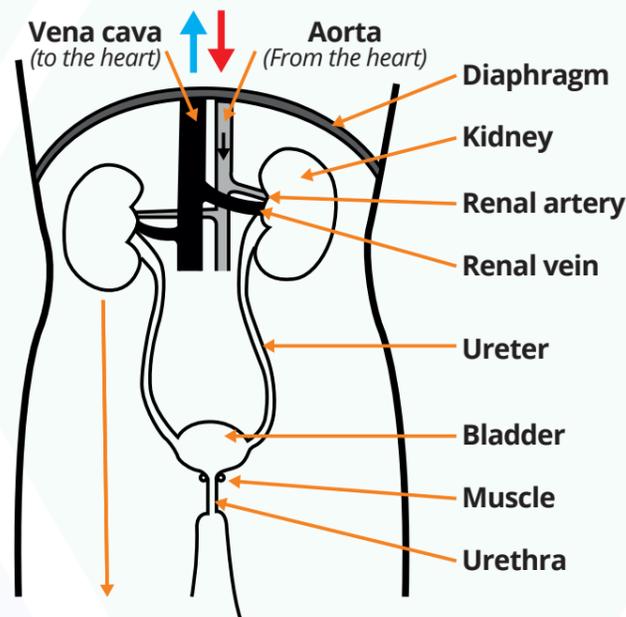


Role of Kidney in Homeostasis- Biology only

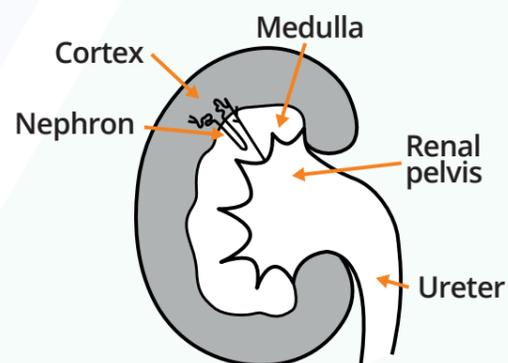
The Excretory System - Removes urea a waste product of metabolism and regulates the water content of the blood.



Cleaning the blood

- Blood from the aorta moves into the renal artery and into the kidney.
- The kidney filters the blood and removes some water, urea and excess salts.
- Cleaned blood returns to the heart in the vena cava.
- The filtrate called urine leaves the kidneys in the ureters and is stored in the bladder.
- Urine is passed out of the body through the urethra.

Inside the kidney

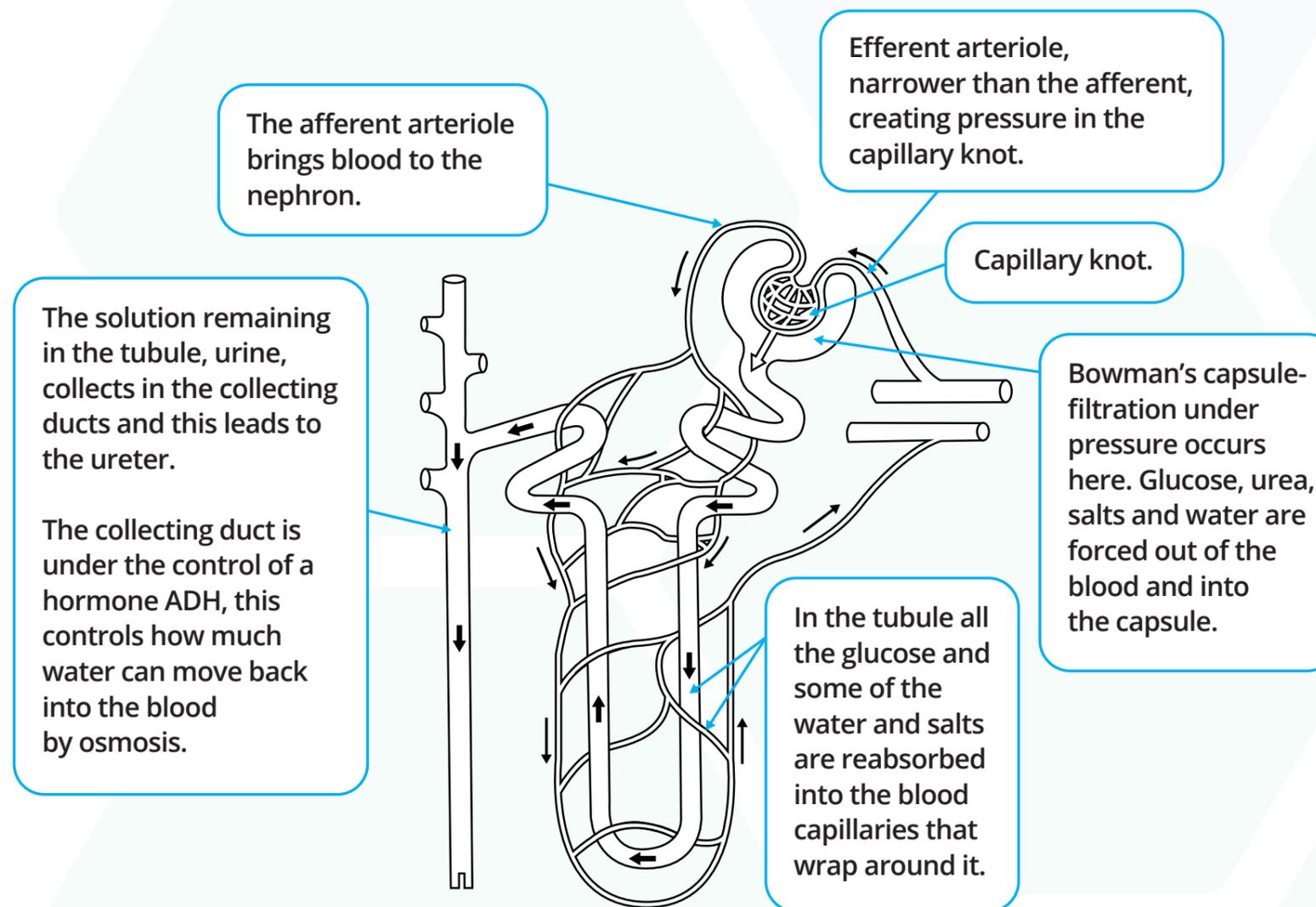


There are about a million nephrons in each kidney. They filter the blood.

Detecting disease

- Red blood cells in urine indicates kidney damage or disease.
- Glucose in the urine can indicate diabetes.

The Nephron- Higher tier only

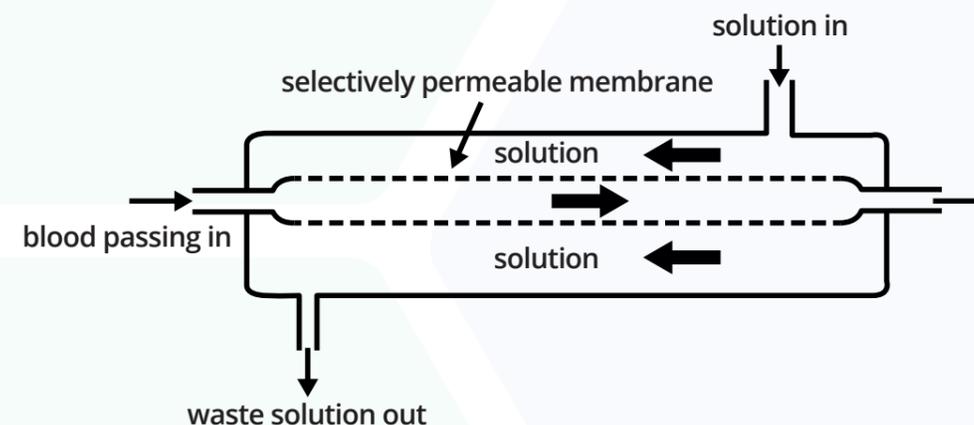


Kidney Failure

Treatments	Advantages	Disadvantages
Dialysis	Immediately available.	A long time spent in hospital attached to a dialysis machine every week and diet is restricted.
Transplant	Can last 12-15 years with minimal medical intervention.	Immunosuppressant drugs must be taken to avoid rejection . A donor must be found and must have a similar tissue type to the recipient, so a close family living donor is preferable.

How dialysis works- Higher tier only - blood is removed from the body and flows through tubing made from a selectively permeable membrane.

Dialysis fluid contains equal concentration of glucose and salts that should not be removed from the blood. It contains no urea and so urea will diffuse from a high concentration in the blood out into the dialysis fluid which is then disposed of.

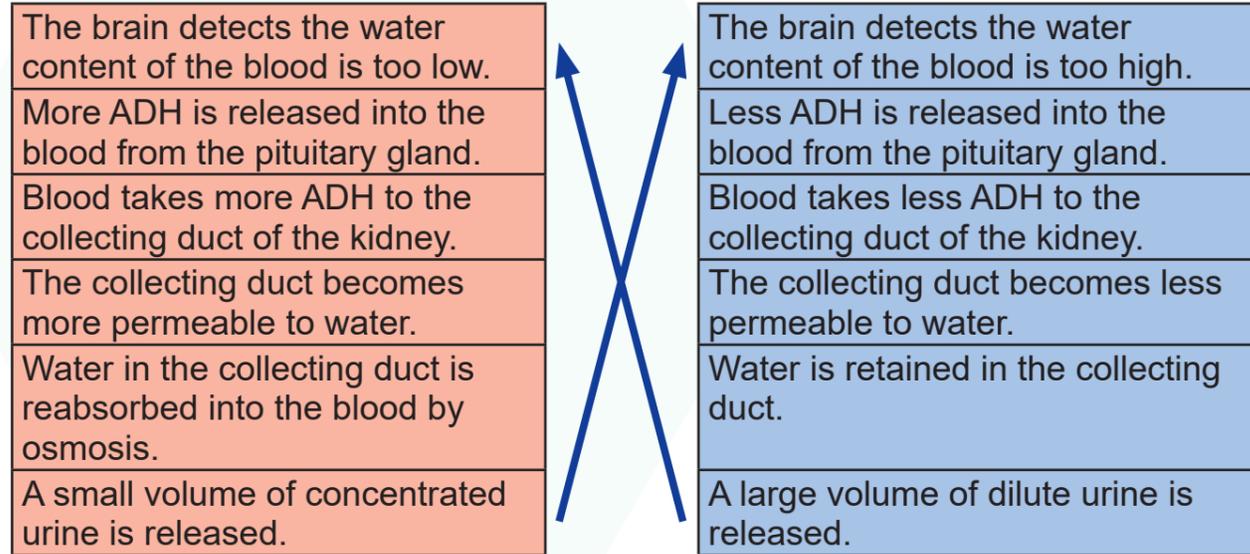


Dialysis fluid and blood will flow counter current to each other to maintain a concentration gradient for diffusion of urea across the whole membrane.

Role of Kidney in Homeostasis- Biology only

Control of water in the blood by Antidiuretic hormone (ADH)

The brain monitors the water content of the blood as shown below:



This process operates by negative feedback.