

KNOWLEDGE

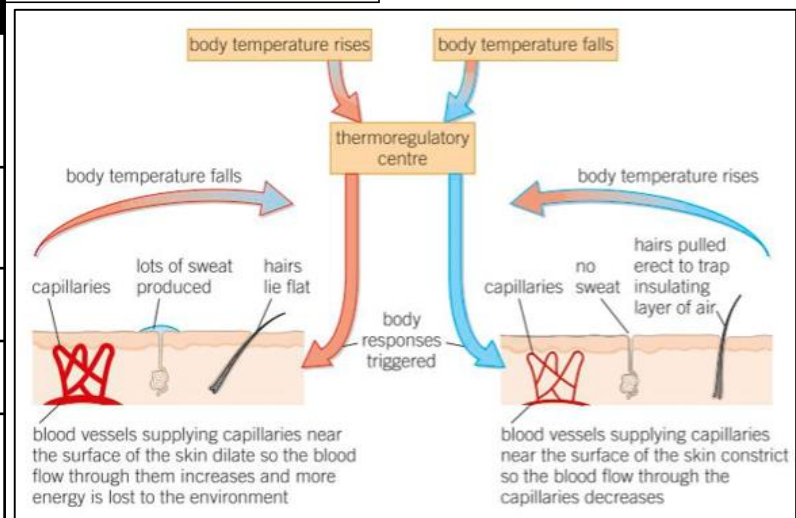


Biology Topic B12 Homeostasis in action (separate)

ORGANISER

Section 1: Temperature control

Vasodilation	Arterioles (blood vessels) supplying skin capillaries dilate so more blood can flow close to the surface of the skin. Helps transfer heat energy from the skin to the environment to cool you down
Vasoconstriction	Arterioles supplying the skin capillaries constrict so less blood flows under the surface of the skin. Reducing heat loss when you are too cold
Sweating	Sweat glands release sweat when you are too hot. When sweat evaporates it transfers energy to the environment
Shivering	Shivering is when muscles contract rapidly, this need respiration which transfers energy to the body to warm you up
Thermoregulatory centre	Found in the hypothalamus in the brain, detects blood temperature changes and receives information about skin temperature too



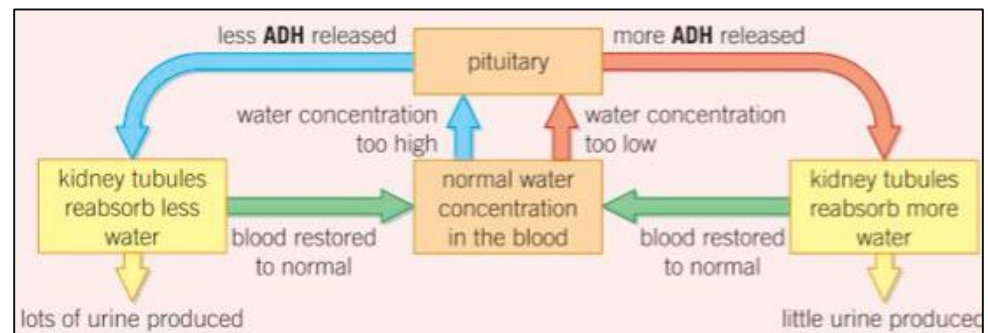
Section 2: Water and nitrogen control

Urine contains.....

Urea	Excess proteins are broken down into amino acids in the liver. These amino acids are turned into ammonia which is toxic so it is quickly turned into urea and excreted from the body in urine
Ions	Excess ions are removed in the urine
Water	Water leaves the body via the lungs during exhalation Water, mineral ions and urea are lost through the skin in sweat Excess water and mineral ions is removed via the kidneys in urine If the body cells lose or gain too much water through osmosis, they do not function efficiently.

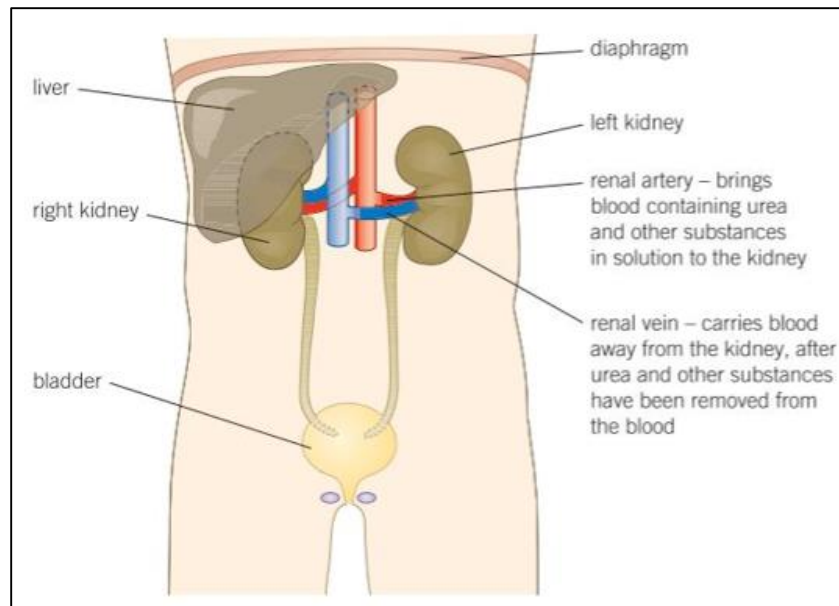
Section 3: Water and nitrogen control - ADH

ADH	Anti-diuretic hormone controls the concentration of the urine
Pituitary gland	Releases more or less ADH depending on how much water is in the body
Negative feedback	Controls water levels in the body



Section 1: The Kidney – removes waste substances

- A kidney produces urine firstly by **filtering** the blood.
- **Selective reabsorption** then occurs. This means that **all** of the **glucose** is reabsorbed back into the blood, along with **some** of the **ions** and **some** of the **water** depending on the concentration of these within the body.
- The kidney **excretes urea** in the urine along with any **excess water and ions**.
- **Protein** molecules are too **large** to pass through the kidney filters so remain in the blood and are not therefore excreted in the urine of a healthy person.



Section 2: Kidney failure Treatments

	Advantages	Disadvantages
Kidney transplants	<ul style="list-style-type: none"> • Patients can lead a more normal life without having to watch what they eat and drink • Cheaper for the NHS overall 	<ul style="list-style-type: none"> • Organ rejection by the patient's immune system • Must take immune-suppressant drugs which increase the risk of infection • Shortage of organ donors • Kidney only lasts 8-9 years on average • Any operation carries risks
Kidney dialysis	<ul style="list-style-type: none"> • Available to all kidney patients (no shortage) • Can buy valuable time until a donor is found • No need for immune-suppressant drugs 	<ul style="list-style-type: none"> • Patient must limit their salt and protein intake between dialysis sessions • Expensive for the NHS • Regular dialysis sessions – impacts on the patient's lifestyle • Can cause blood clots or infections