

This is the **Higher Separate** version — includes all Higher Tier content (marked ★) and all Separate Science content.

The kidneys filter blood and regulate water, ion and urea concentrations — essential for maintaining the internal environment.

- ★ **HT Ultrafiltration:** blood filtered at high pressure in glomerulus → water, glucose, urea, ions enter Bowman's capsule
- ★ **HT Selective reabsorption:** ALL glucose reabsorbed (active transport); most water reabsorbed; some ions reabsorbed
- ★ **HT Urine:** remaining water, urea, excess ions → ureter → bladder → urethra
- ★ **HT ADH (antidiuretic hormone):** released when blood water low → kidney reabsorbs more water → concentrated urine
- **Dialysis:** filters blood through partially permeable membrane — for kidney failure patients
- **Kidney transplant:** permanent solution but requires matched donor, lifelong immunosuppressants

Key Terms

Ultrafiltration	High-pressure filtration of blood in the glomerulus
ADH	Antidiuretic hormone — makes kidney more permeable to water — concentrates urine
Dialysis	Artificial kidney — filters blood through membrane

■ **Exam Tip:** ADH works by negative feedback: dehydrated → more ADH → more water reabsorbed → less concentrated blood → less ADH. Know the full feedback loop.