

Excretory System :

Maintains homeostasis by collecting and removing waste products from our body.

Mainly the work of the kidneys, which filter waste products from our blood, concentrates them as urine in the bladder, which is then removed from the body.

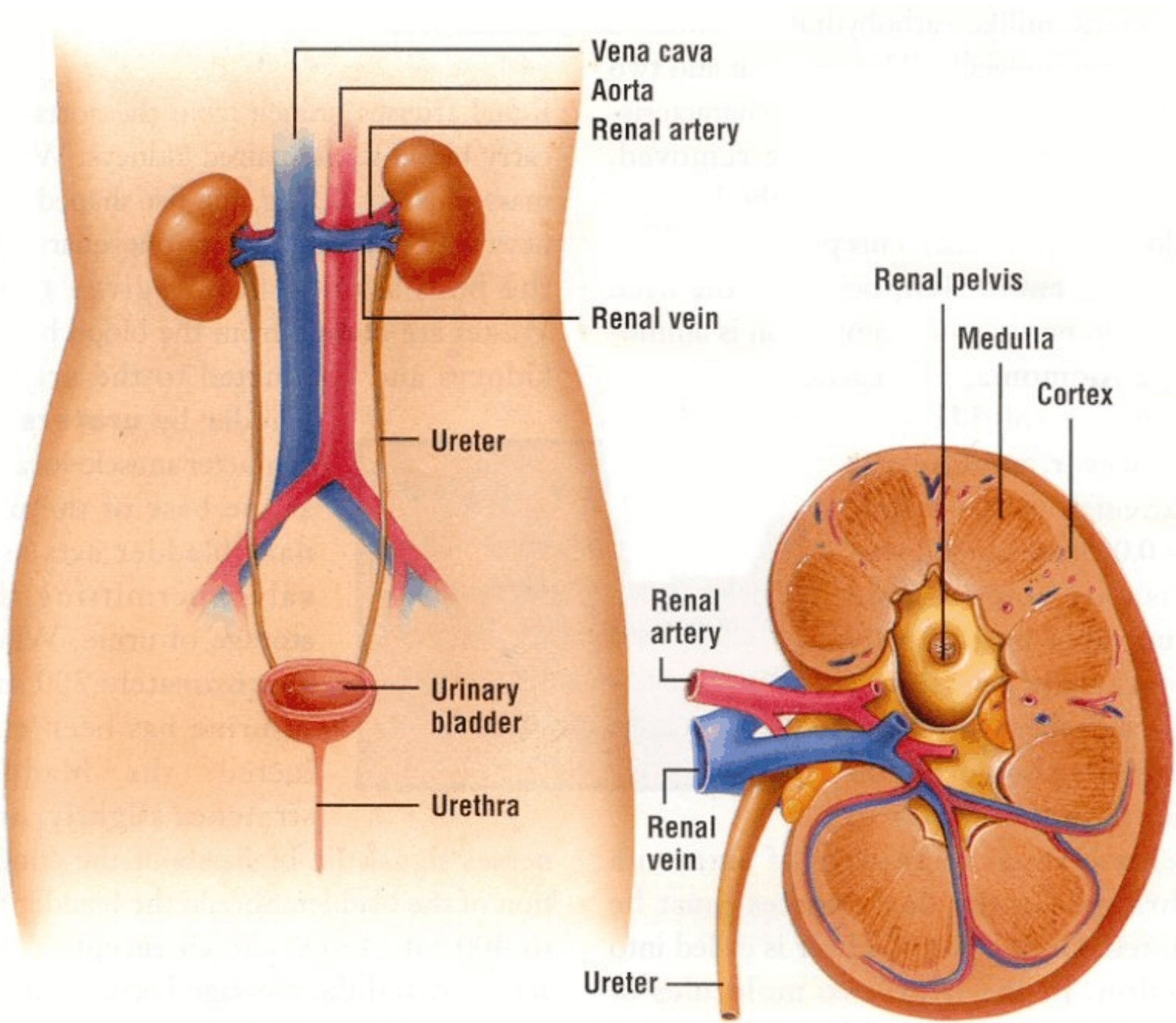
Also involves ...

the skin - removing excess heat made during cell respiration

Lungs - removing gaseous wastes (CO₂) from the blood

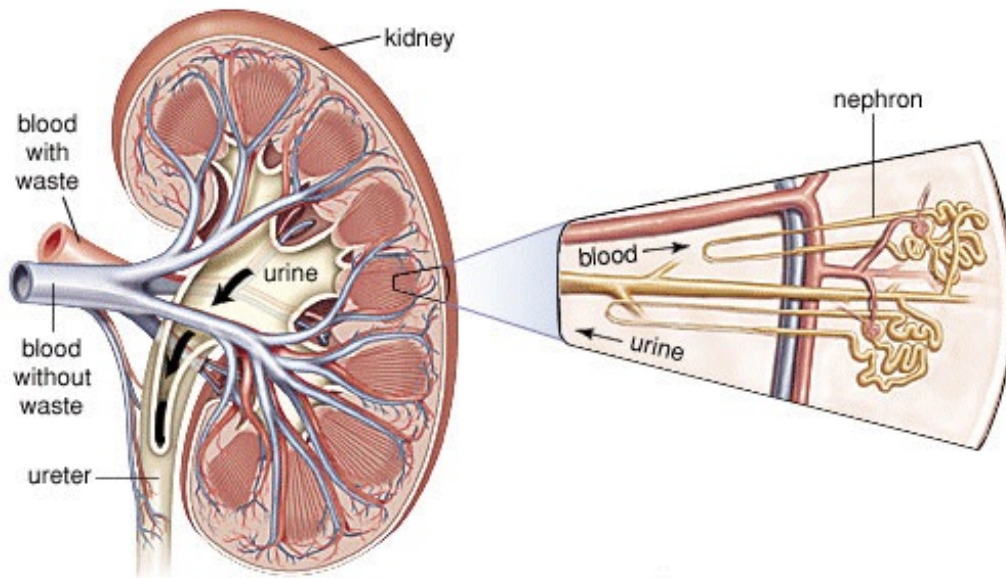
Liver - detoxifies blood, removing dead/damaged cells and toxins up to a point.

System structure :



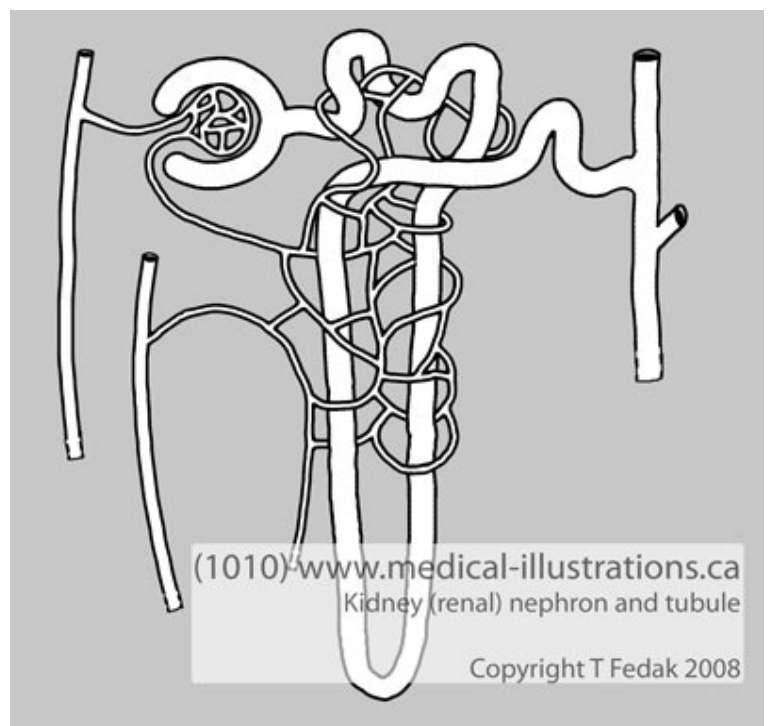
Renal blood vessels, kidneys, ureters, bladder and urethra (5 cm in females, 20 cm in males)

Kidney layers - cortex, medulla, pelvis



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Kidney nephrons and their parts - glomerulus, Bowmans capsule, PCT, Loop of Henle, DCT, collecting duct



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How a nephron works :

1. capillary brings blood into Bowmans capsule, to the glomerulus (a net of more capillaries)
2. Blood pressure forces some plasma and its solutes to move from the blood into Bowmans capsule...larger substances don't move in.
3. Inside the PCT, reabsorption happens...valuable materials are absorbed back into the bloodstream, water, sugars, amino acids, dissolved ions.....making the filtrate isotonic
4. Filtrate moves into the Loop of Henle...uses osmosis to remove water due to surrounding salt concentrations (descending) and salts are removed from the filtrate in the ascending side (AT) ...impermeable
5. DCT.....tubular secretion.....H⁺ ions, creatinine, some drugs.....filtrate (urine) now passes into collecting duct...on to the pelvis

Step 5 affected by PG's secretion of ADH

Kidney Disorders :

1. **Renal failure** - waste products (urea, uric acid, and creatinine build up in the blood (uremia), loss of consciousness....death

Treatment : hemodialysis / kidney dialysis

Heparin (anticoagulant) treated blood sent through dialysis tubing inside a dialysis machine. Wastes removed using concentration gradient (into dialysate fluid)

Organ transplant - x e n o - o r a l l o -
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2. **Urinary tract infections** (UTI's) - urethritis and cystitis....painful pee, discolored urine, feels like you have to go a lot, nothing happens, tenderness, fever, nausea.....treated with antibiotics, maybe surgery.

3. **Kidney stones** - dissolved substances crystallize and precipitate out of urine. (Calcium oxalate), caused by repeated infections, dehydration, low activity, too much Vit C or D.....back pain, blood in urine, may require meds or surgery, most pass on their own.