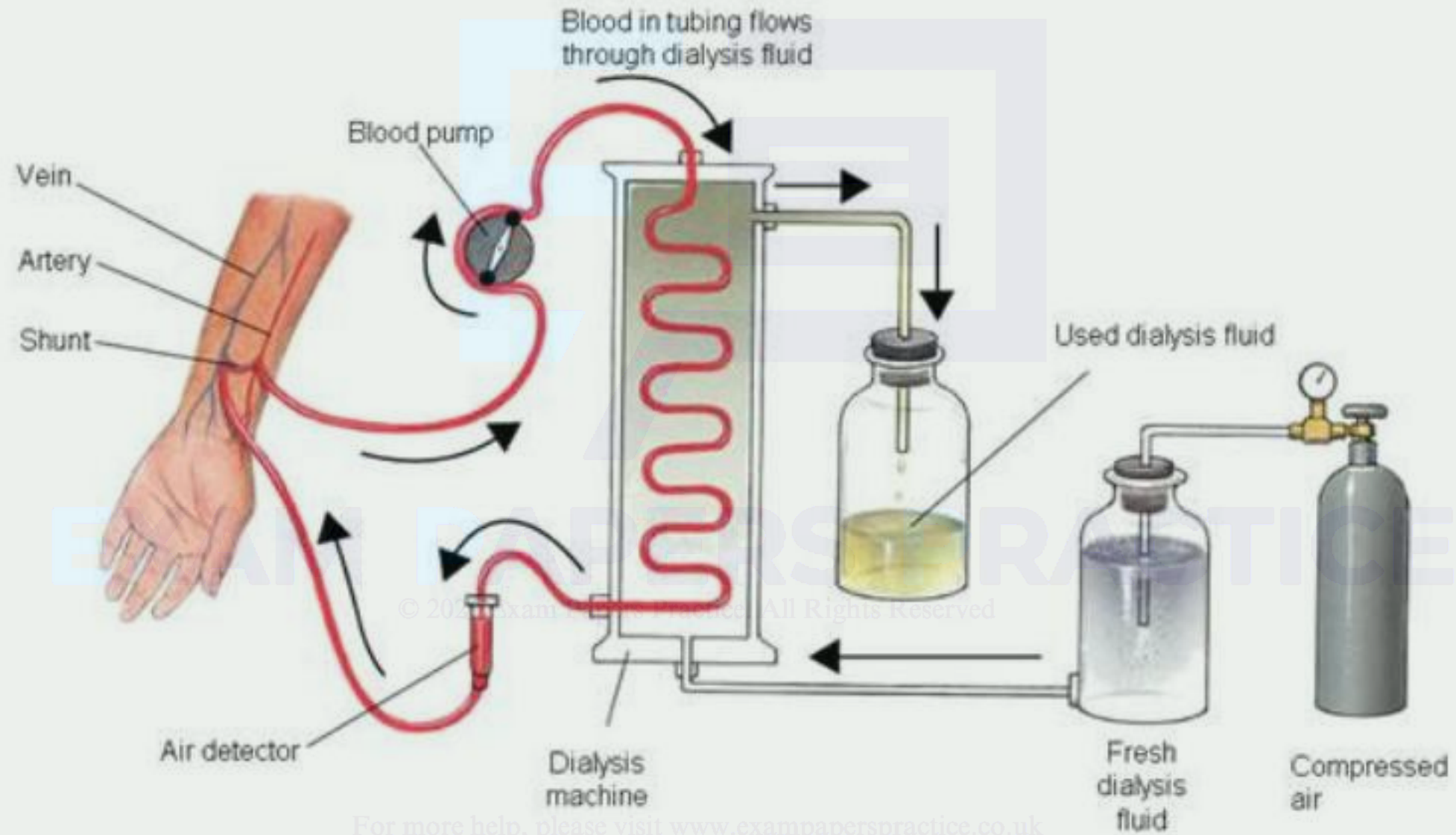


12 excretion



12 excretion

Excretory products

The reason to excrete waste products

These substances may become poisonous or toxic.

- ◆ carbon dioxide —— lungs
- ◆ urea —— kidneys

Definition of excretion

The removal from organisms of the waste products of metabolism, toxic materials, and substances in excess of requirements

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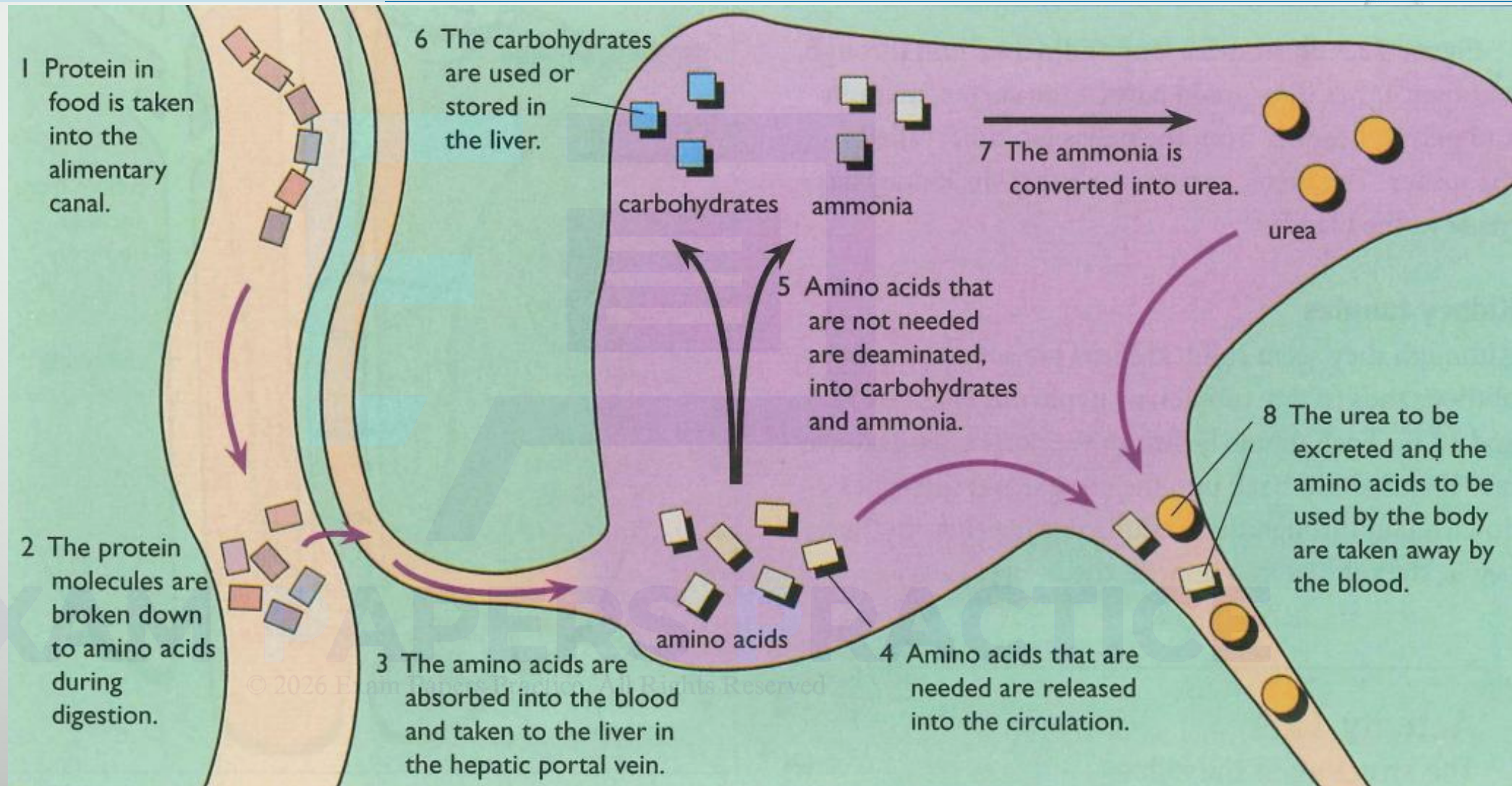
excretion 排泄
excretory product

Egestion

Getting rid of undigested substances in faeces through alimentary canal.

12 excretion

Nitrogenous waste



Deamination

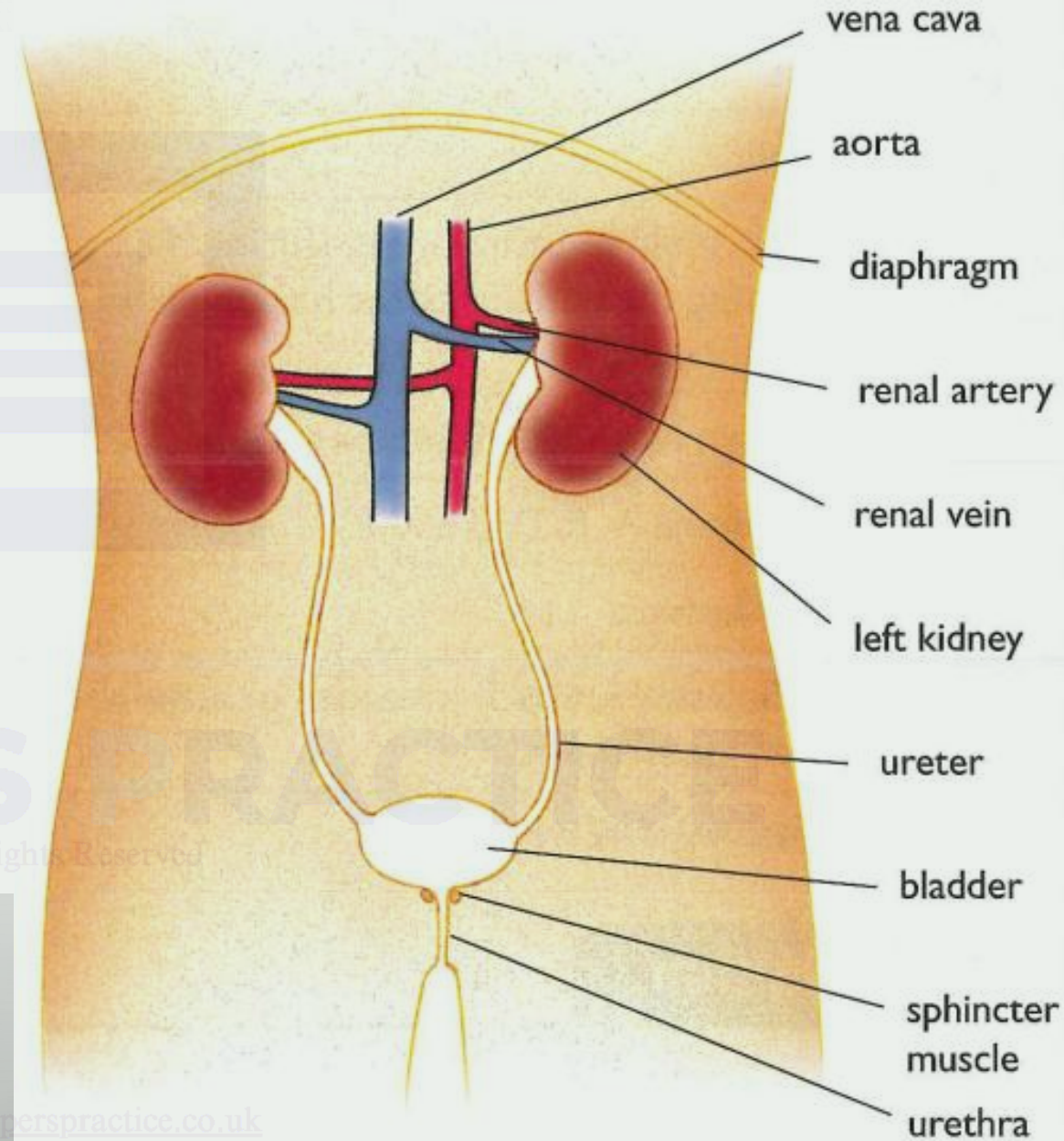
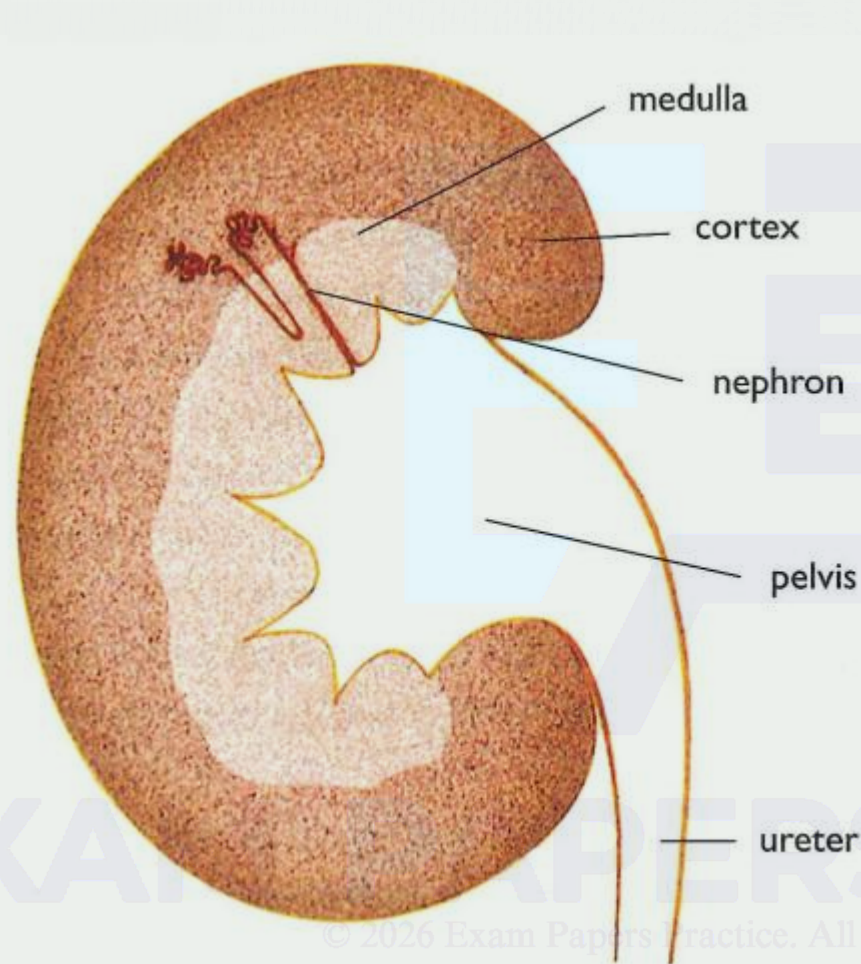
The removal of the nitrogen containing part of amino acid to form urea.

12 excretion

1	Converts excess amino acids into urea and carbohydrates, in a process called deamination.
2	Synthesises plasma proteins such as fibrinogen, from amino acids.
3	Controls the amount of glucose in the blood, with the aid of the hormones insulin and glucagon.
4	Stores carbohydrate as the polysaccharide glycogen.
5	Makes bile.
6	Breaks down old red blood cells, storing the iron and excreting the remains of the haemoglobin as bile pigments.
7	Breaks down harmful substances such as alcohol.
8	Stores vitamins A, B, D, E and K.
9	Stores potassium.
10	Makes cholesterol, which is needed to make and repair cell membranes.

12 excretion

Excretory system



ureter 输尿管 bladder 膀胱

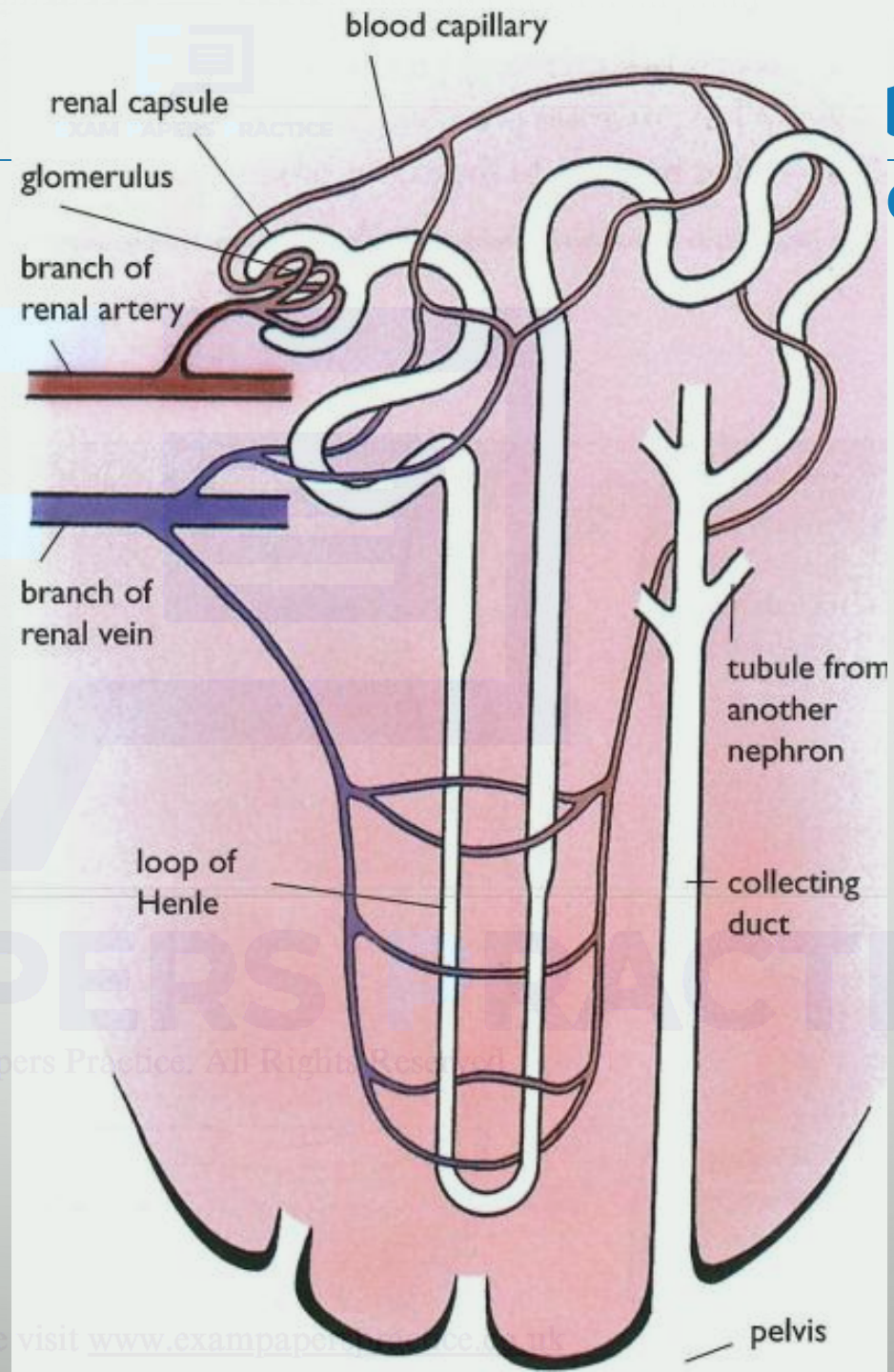
urethra 尿道 renal vein 肾静脉

renal artery 肾动脉

medulla 髓质 cortex 皮质 pelvis 肾盂

12 excretion

tion —
on



glomerulus 肾小球
renal capsule 肾小囊
Kidney tubule 肾小管

12 excretion

filtration

A tangle of blood capillaries (glomerulus) bringing blood. The blood vessel bringing blood is quite wide, but the one taking blood away is narrow. This cause there is a **high pressure** in the glomerulus.

These walls have **small holes** in glomerulus. Any small molecules can to through these holes into the space in the renal capsule.

—— small molecules (water, salts, glucose and urea)

filtration 过滤

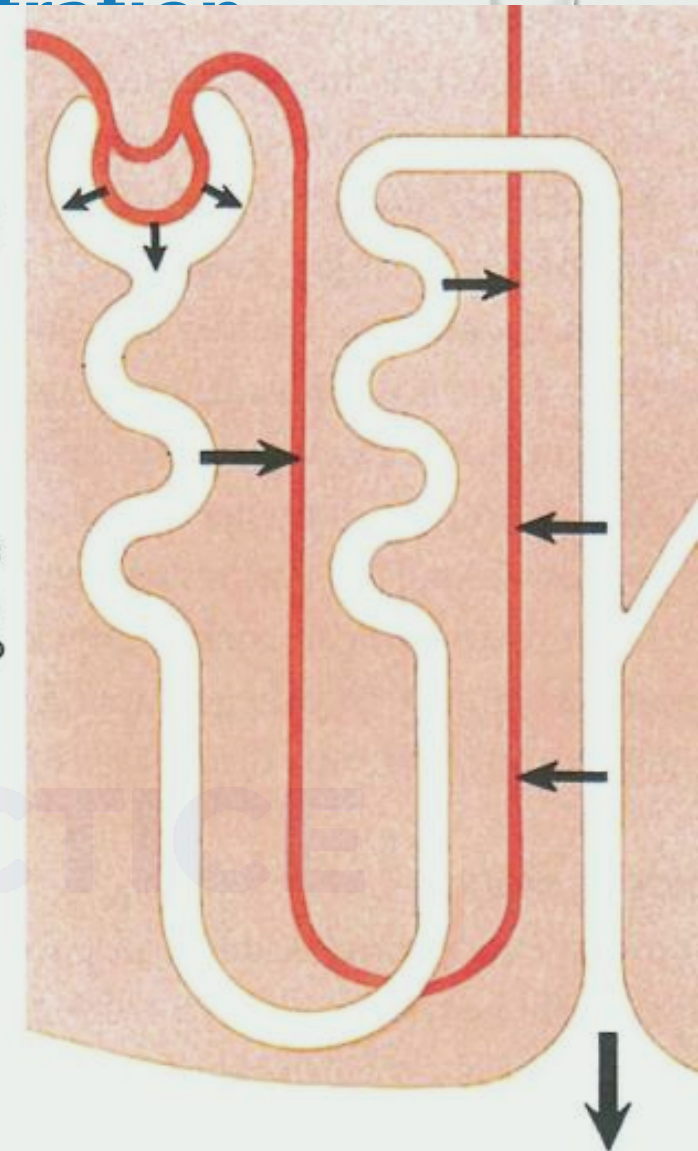
Urine formation —

Filtration

Small molecules, such as water, glucose, salts and urea, are squeezed out of the blood into a renal capsule.

Reabsorption

Any useful substances, such as water and glucose, are taken back into the blood.



The remaining liquid, called urine, flows into the ureter.

12 excretion

reabsorption

All of the glucose, some of water, some of the salts

Any useful substances are taken back into the blood from kidney tubule.

Urine
mostly water, urea, salts

urine 尿液

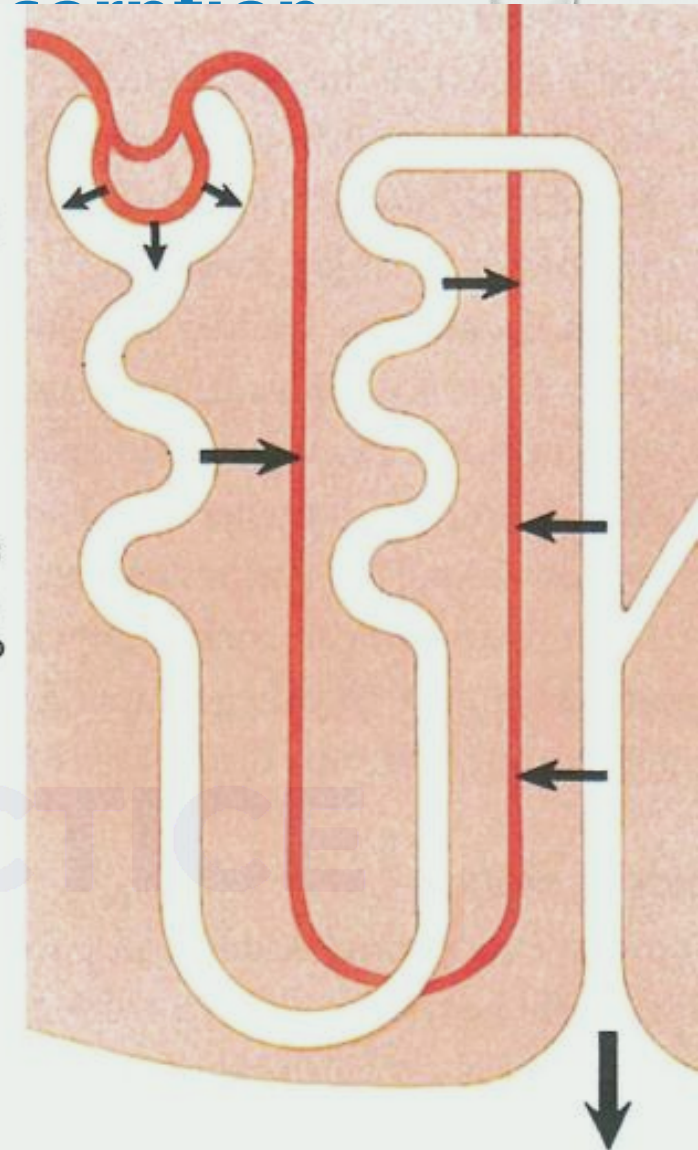
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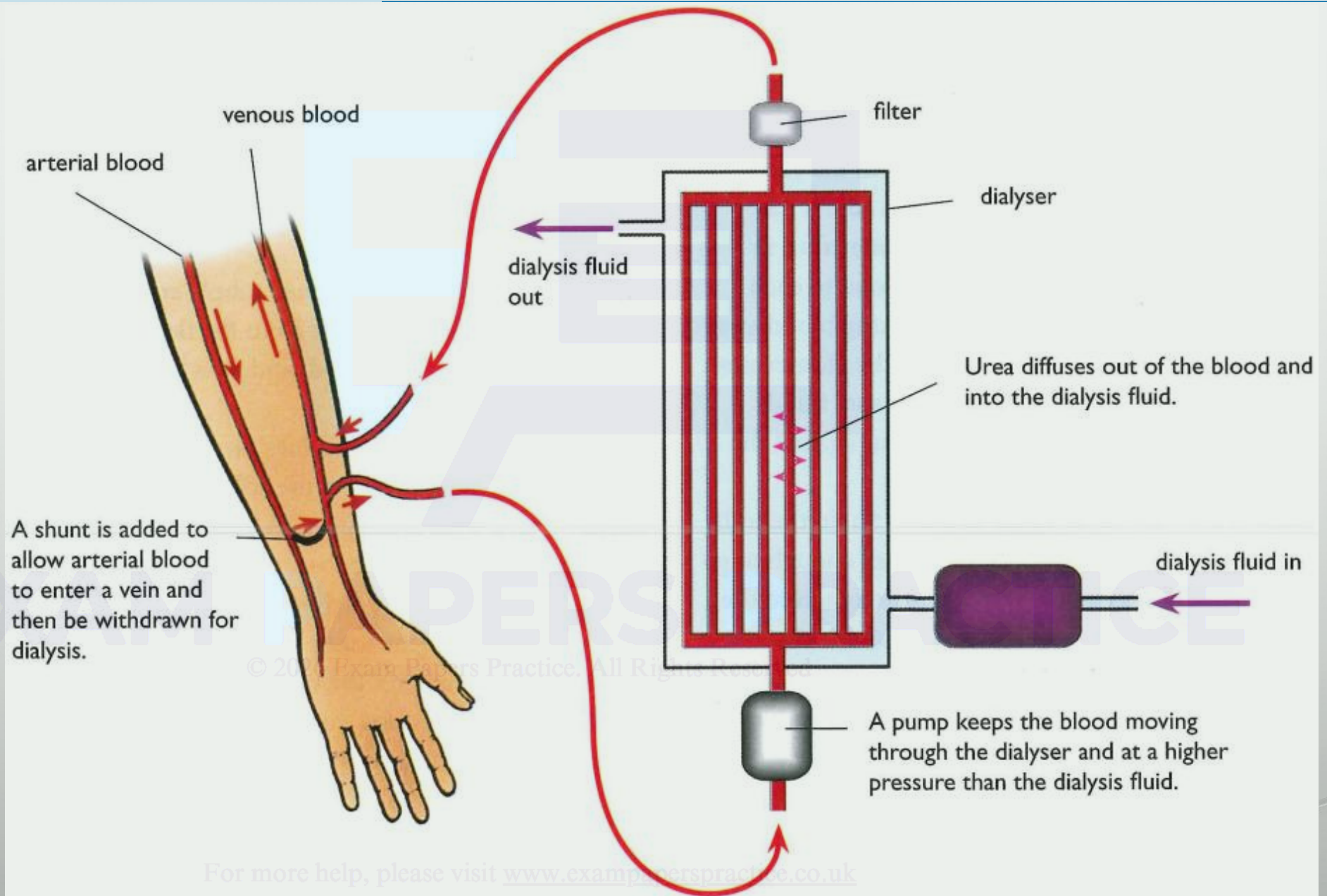
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12 excretion

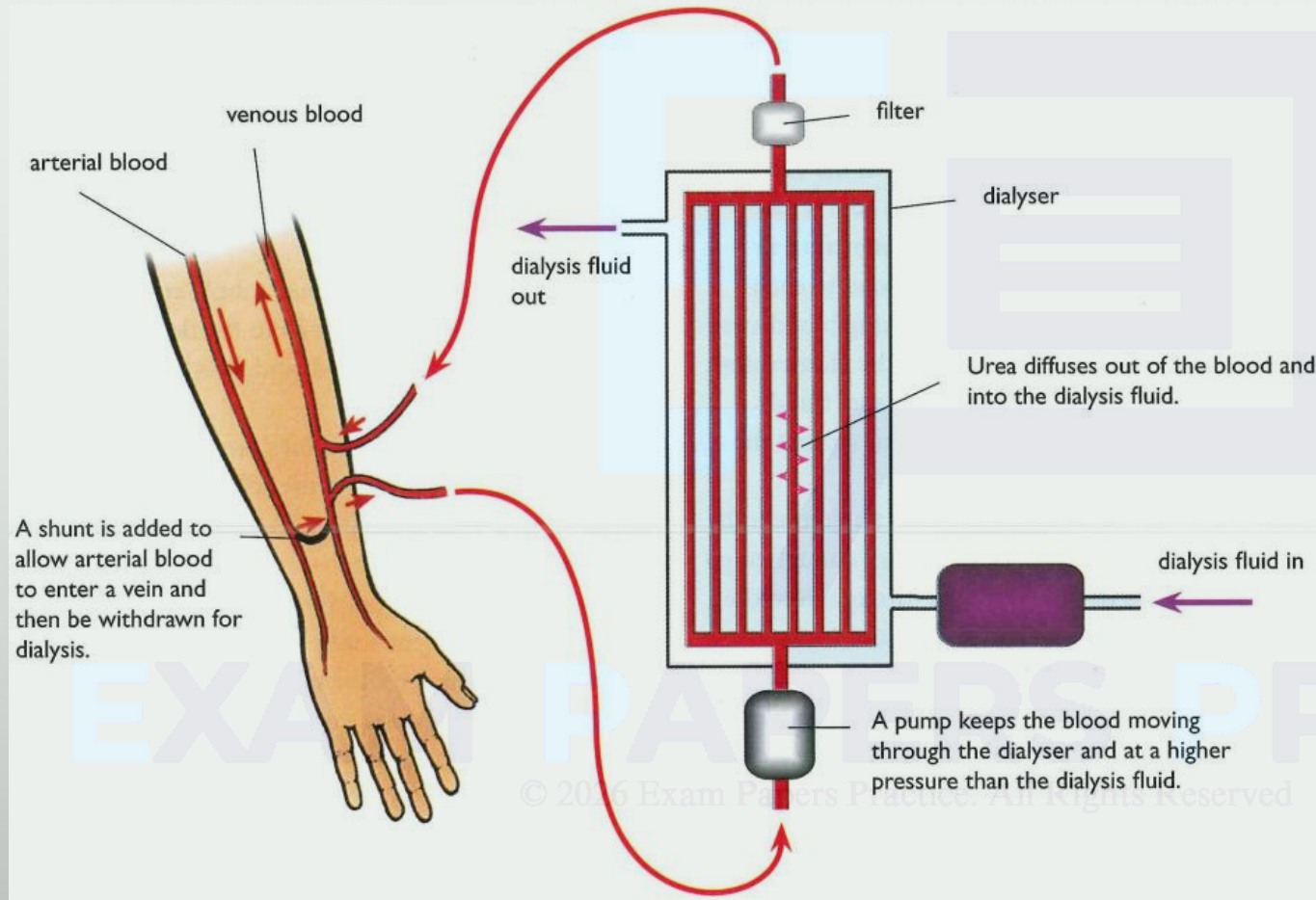
Kidney dialysis



dialysis 透析

12 excretion

Kidney dialysis



Dialysis fluid

Contains water, glucose, salts and other substances that should present in the blood.

Substances diffuse through the membrane, down their concentration gradients.

urea

disadvantage

Patients need to be treated on a dialysis unit two or three times a week, and the treatment lasts for several hours.

dialysis fluid 透析液

12 excretion

Kidney transplant

Kidney transplant



Kidney from donor may be rejected by recipient. Because they have different antigens
→ recipient's immune system attacks kidney from donor

Immunosuppressants stop the white blood cells working efficiently to decrease the chances of rejection
→ so the person likely to suffer from all sorts of infectious diseases

Closely related people are more likely to have antigens which are similar to each other, so the recipient's immune system is less likely to react to the donated organ.

donor 捐赠者
recipient 接受者
immunosuppressant 免疫抑制剂

DIALYSIS	TRANSPLANT
• More expensive in the long run • Very disruptive (three 6-8 hrs sessions per week) • Do not need to find kidney • Need a machine & must live near one	• Less expensive in the long run • Not very disruptive (only have to take medication) • Need a kidney • Can go anywhere, anytime • Risk of rejection

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