

IGCSE Biology Workbook

13. Excretion

The stuff you need to know in this chapter:

Core:

- State that urea is formed in the liver from excess amino acids
- State that carbon dioxide is excreted through the lungs
- State that the kidneys excrete urea and excess water and salts
- Explain that the volume and concentration of urine produced is affected by water intake, temperature and exercise
- Identify on drawings, diagrams and images, the ureters, bladder and urethra

Extended:

- Describe the role of the liver in the assimilation of amino acids by converting them to proteins, including plasma proteins, e.g. fibrinogen
- Define deamination as the removal of the nitrogen-containing part of amino acids to form urea
- Explain the need for excretion, limited to toxicity of urea and carbon dioxide
- Outline the structure of the kidney, limited to the cortex, medulla and ureter
- Outline the structure and functioning of a kidney tubule, including:
 - the role of the glomerulus in the filtration from the blood of water, glucose, urea and salts
 - the role of the tubule in the reabsorption of all of the glucose, most of the water and some salts back into the blood, leading to the concentration of urea in the urine as well as loss of excess water and salts (details of these processes are **not** required)
- Explain dialysis in terms of salt balance, the maintenance of glucose concentration and the removal of urea
- Describe the use of dialysis in kidney machines
- Discuss the advantages and disadvantages of kidney transplants, compared with dialysis

(CIE, 2014)

Ref:

- CIE: Cambridge International Examination (2014) *0610 IGCSE Biology Syllabus Guide* [Online]

EXCRETION

Define excretion

Name one thing that is excreted...

...from the lungs:

...in urine as a result of excess amino acids:

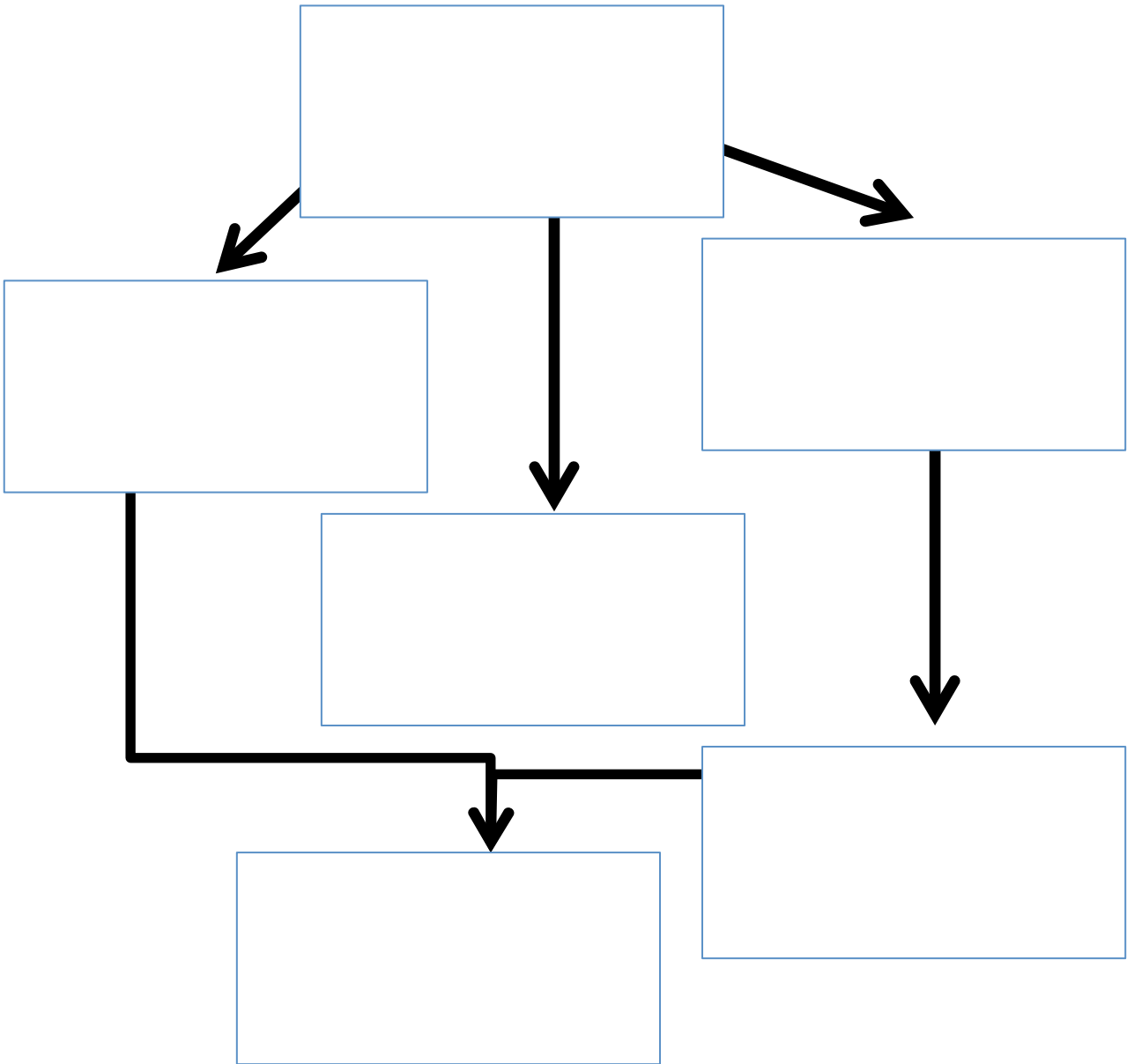
...that is in excess of requirements:

DEAMINATION

Complete flow chart to show how the liver is involved in processing amino acids. Use the phrases in the boxes.

Useful amino acids enter the blood stream to be used elsewhere	Ammonia is converted into urea	Some are converted into ammonia
Blood is filtered in the kidneys where urea is removed	Some amino acids are converted into carbohydrates. They are used or stored in the liver	Urea enters the blood stream

amino acids enter the liver from digestive system

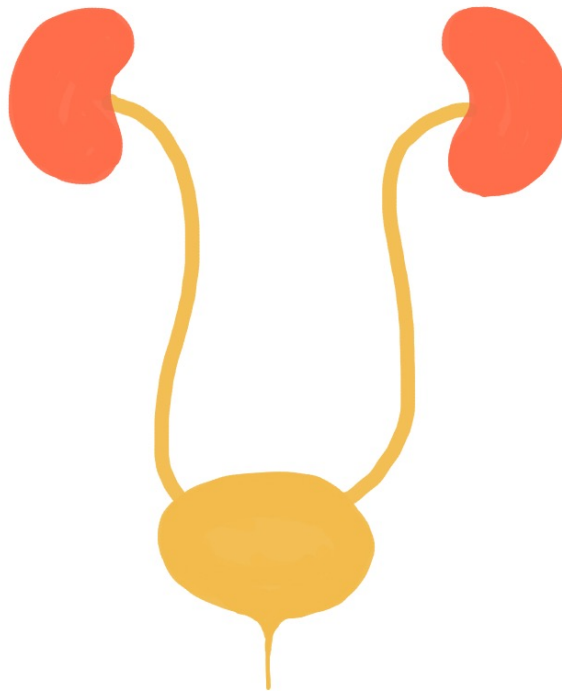


Define deamination

State why urea and carbon dioxide must be excreted

THE KIDNEYS

Label the diagram of the excretory system



Draw a labeled diagram of the kidney showing the medulla, cortex, pelvis, ureter and a nephron*

**For simplicity, diagrams often show only one nephron. In the average human kidney, there are about one million nephrons!*

Fill in the sentences about the kidneys

The kidneys _____ the blood to remove unwanted products. Blood enters the nephron via a capillary network called the _____ which is part of the _____.

Small molecules such as _____ can enter the nephron, but large molecules such as _____ and _____ can't. This process is called _____.

Along the nephron, useful molecules re-enter the blood, and eventually the filtrate enters the _____, where it contains _____, _____ and _____. From here it moves to the bladder and then exits the body.

Draw a labeled diagram of a nephron

DIALYSIS VS TRANSPLANTS

Explain why a person suffering kidney failure needs to undergo dialysis

Name 3 things that must be present in dialysis filtrate

What must the concentration of urea be in dialysis filtrate? Explain your answer.

Draw a diagram to show how dialysis works

People with kidney failure would often prefer to have a kidney transplant. List reasons why a person might prefer a transplant

Give reasons why a person may not have a kidney transplant