

# 10 Medical technology

## LANGUAGE

### 1 Grammar

Choose the correct option to complete the sentences.

- 1 These are the engineers *who / which / whose* developed the system.
- 2 The hospital *which / , who / , which* was built for \$50m, came in under budget.
- 3 Mobility scooters are machines *who / they / which* help the disabled move around more easily.
- 4 An anaesthetist is a doctor *who / who person / which person* helps reduce pain.
- 5 That's the equipment *which / who / , which* I was telling you about.
- 6 Braille is an alphabet *who / which / how* allows the blind to read.
- 7 Where's the *technique / technical / technician* who set up the monitor?
- 8 Is this the sensor *who / which / were* receives the signal?

### 2 Key words from the unit

Complete the sentences with the words from the list.

- 1 You can monitor a baby by \_\_\_\_\_.
- 2 \_\_\_\_\_ limbs can be very effective.
- 3 The internal battery needs to be \_\_\_\_\_.
- 4 The wheelchair is operated by a \_\_\_\_\_.
- 5 A CAT \_\_\_\_\_ creates a 3-D image.
- 6 The buttons \_\_\_\_\_ to alert the user.
- 7 The \_\_\_\_\_ lets the fluid move.
- 8 A GPS device can \_\_\_\_\_ your exact position.

rechargeable
valve
ultrasound
calculate
scanner
joystick
vibrate
artificial

## READING AND VOCABULARY

Medical technology applies engineering to biology and medicine – for example, in the development of aids or replacements for defective or missing body parts. Bioengineering combines biological science with engineering.

One product of bioengineering is the artificial heart. This is made of metal and plastic. It is used to keep very sick patients alive who might die while waiting for a transplant of a natural heart. An artificial heart has an electric motor and a pumping system with hydraulic fluid and hydraulic valves. It has external and internal parts (that is, outside and inside the body). Inside the body is a rechargeable battery which powers the pumping system. This internal battery is recharged by an external battery using a simple electrical coil, which induces a current. This current then recharges the internal battery. The whole system is controlled by a microprocessor (also called a controller) inside the body. Of course, biological safety is very important, so the plastics in the artificial heart are very durable. There is also a heart pacemaker under the skin, which keeps the heart working at a regular pace.

Another product of medical technology is scanning equipment. This scans internal organs of the body, and produces images using technologies such as X-Rays and ultrasound. CAT scanners use special X-ray equipment. (CAT is really CT, which stands for Computed Tomography.) A computer processes the images to create a cross-section of the soft tissue and organs of the body. CT imaging is very useful because it can show the soft parts of the body very clearly.

Electronic Assistive Technology or EAT is an example of mechatronics in medical technology. Mechatronics combines mechanical engineering, electronics and IT. This kind of technology can provide equipment for very disabled people. In a disabled person's house, for example, this equipment allows them to control doors, lights, televisions, computers, etc. with eye movements.

Another example of EAT is the ultracane. Blind people often carry a cane when walking. The ultracane uses ultrasound (sound above the level of human hearing) to help blind people detect objects around them. Some people call it the 'batcane' because bats use ultrasound when they fly at night.

### 3 Comprehension

Answer the questions.

- 1 Why are artificial hearts given to some patients before a heart transplant?

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- 2 What is the external battery in an artificial heart for?

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- 3 What do medical scanners do?

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- 4 Why are CT scans used for scanning hearts and other organs?

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- 5 How many examples of EAT are given?

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- 6 Why can't people hear ultrasound?

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**4 Words from the text**

Find words that mean:

- 1 things that help (paragraph 1) \_\_\_\_\_
- 2 not working correctly (paragraph 1) \_\_\_\_\_
- 3 a person receiving medical help (paragraph 2) \_\_\_\_\_
- 4 movement of something (e.g. a heart) from one fixed position to another (paragraph 2) \_\_\_\_\_
- 5 pictures (paragraph 3) \_\_\_\_\_
- 6 mechanical engineering with electronics (paragraph 4) \_\_\_\_\_.

**5 Further vocabulary practice**

Complete the sentences with the opposite of the bold word.

- 1 There is a **right** way and a \_\_\_\_\_ way to use this machine.
- 2 An \_\_\_\_\_ heart is not as good as a **natural** heart.
- 3 There are **internal** and \_\_\_\_\_ parts.
- 4 This part moves \_\_\_\_\_ and **forwards**.
- 5 Medical robots have **advantages** and \_\_\_\_\_.
- 6 Turn the key **clockwise**, not \_\_\_\_\_.

**WRITING**

**6 Describe a machine**

Study the information about an electric toothbrush. Then write a description of the device.

<b>Machine:</b> electric toothbrush <b>Use:</b> clean teeth efficiently	
Components	Function
<u>small brush</u>	holds the toothpaste fits into the handle
<u>handle</u>	contains other components
motor	moves the brush very fast
rechargeable battery	powers the motor
switch	controls the motor
<u>separate charger</u>	plugs into a wall socket recharges the battery

**An electric toothbrush**

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