LISTENING

1 What medical developments do you think will happen in the next 100 years?

2 4.5 Listen to six doctors and medical researchers predicting what medical developments will take place. Tick the topics which are mentioned.

1	radiation	4	blindness
2	heart attacks	5	obesity
3	knee injuries	6	cancer

3 Listen again. Match statements a–i with extracts 1–6. There are three extra statements.

a People will wear airbag suits to avoid injury to their knees.
b Cancer is probably not going to be a problem.
c We will have developed the ability to diagnose at birth all known genetic diseases.
d Scientists will have created miniature robots capable of performing microsurgery.
e X-rays and radiation will still be around.
f We probably won't be able to grow a baby completely outside a woman's body.
g We will probably find a genetic way to cure the main cause of blindness.
h Most medical education will be done at a distance.
i We will be able to help people exposed to radiation through research in space.

4 Work with a partner. Which of the developments do you think will be the most useful?

VOCABULARY

DEPENDENT PREPOSITIONS

5a Write the prepositions that follow these verbs. Then look at Audio script 4.5 on page 172 to check. Look at Extracts 1, 3, 4 and 6.

1	focus	5	worry
2	succeed	6	agree
3	suffer	7	protect
4	recover	8	care

5b Complete the sentences with verbs and prepositions from Exercise 5a.

1 Has he _____ his illness yet?
2 I feel very lonely and I _____ depression.
3 He spent five years _____ his aged mother.
4 This net should _____ you _____ mosquitoes.
5 Parents are often anxious and _____ their children.
6 The doctor _____ me that while she's sick, she needs a little extra care.
7 You need to concentrate and _____ your exams.
8 You have to work hard if you want to do well and _____ medicine.

6a Complete the questions with the prepositions in the box.

about for in on with

1 What do you complain _____ the most?
2 Who is the most difficult person you have to deal _____?
3 What courses have you applied _____ recently?
4 What subject have you / would you like to specialise _____?
5 Who can you rely _____ the most?

6b Work with a partner and ask and answer the questions.

GRAMMAR

FUTURE PERFECT SIMPLE, FUTURE SIMPLE

7a Look at these examples of the future perfect simple and choose the correct alternative in the explanation.

1 By 2120, engineers **will have developed** a 'smart suit'.
2 In 100 years **we will have developed** a way to protect astronauts from radiation.

GRAMMAR TIP

We use the future perfect simple for an action *completed before a point in time in the future / in progress at a time in the future.*

7b Now complete this rule for the formation of the future perfect simple.

The future perfect simple = _____/*won't* + _____ + past participle (e.g. *developed*)

➥ Language reference and extra practice, pages 126–149

8 Look at Audio script 4.5 on page 172 and underline examples of the following. Do the adverbs come before or after *will* and *won't*?

1 the future perfect simple
2 the future simple
3 adverbs of certainty (e.g. *certainly, possibly*)

9 Complete this company announcement using the correct form of the verbs in brackets.

Anderson Bio-Sciences announces its takeover next week of the Essex-based company HGP. Together, ABS and HGP [1]_____ (form) the largest genetic engineering company in the UK, and by 2025, we [2]_____ (expand) to employ over 1,000 people. In addition, by 2025, the company [3]_____ (become) the largest employer of medical researchers in the country. HGP has made exciting discoveries about the human chromosome set and we [4]_____ (publish) that knowledge on the internet. This [5]_____ (revolutionise) biology and medicine and [6]_____ (give) researchers huge potential to develop new drugs. In 2025, medical records [7]_____ (include) people's complete genomes and this [8]_____ (permit) doctors to treat people as genetic individuals. By 2025, the company [9]_____ (make) substantial progress towards true 'cloning' of certain organs.

10 Write five sentences about yourself using the future simple or the future perfect simple. Use time references as well.

READING

11 **Work in small groups to discuss the questions.**

1 What do you think are the most exciting recent or current medical breakthroughs?
2 What would you most like to see, smell, taste, hear or touch, if you could only have that sense for one more day?
3 Which of the following do you think are the most important: bionic eyes, bionic arms, bionic hands, bionic legs, bionic nose, bionic tongue?
4 How do some animals sense the world differently to humans?

12 **Read the online article about a current medical breakthrough quickly and note down who or what the following are.**

1 Dianne Ashworth
2 The Royal Victorian
3 Bionic Vision Australia
4 Penny Allen

13 **Read the article again and decide which three of the following could be subheadings (to attract online readers to read the article).**

1 Australian woman was first to receive radical implant.
2 Scientists make blind mice see with radical new implant.
3 Dianne Ashworth has spoken for first time of the 'little flash' that signalled the return of her vision.
4 Breakthrough is one of several projects around the world that could restore vision for millions.
5 Researchers hope blind people will be able to move independently.

14a **Make notes on the key points in the article. Make sure you cover the following main topics.**

- what has just happened
- what the bionic eye is, how it works, who designed it
- future developments and hopes

14b Retelling a story **Work with a partner and retell the story in your own words.**

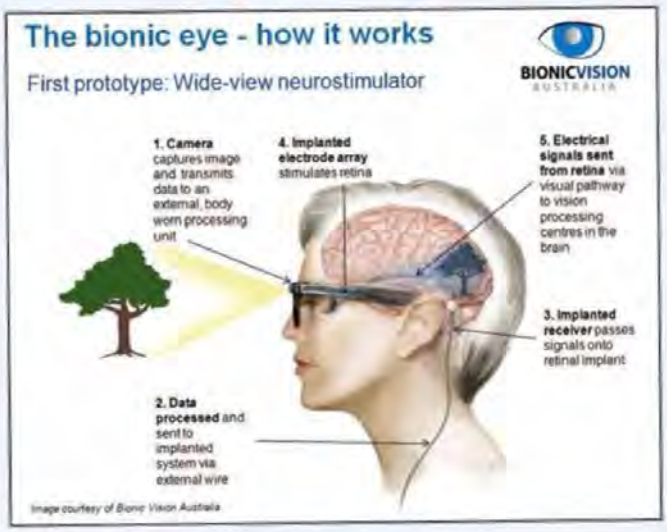
SPEAKING

15 **Work in groups. What do you hope for your country, in terms of health and society? Discuss your hopes for the next fifty years.**

I hope my country will have eradicated polio in the next few years and I also hope my country will have improved opportunities for women.

MEET THE EXPERT

Watch an interview with Dr Tina Chowdhury, a lecturer in Musculoskeletal Science, about medical bionics.
Turn to page 151 for video activities.



Vision of the future: The bionic eye that could help millions of blind to see again after woman had some sight restored in pioneering tests

Scientists have taken an important step towards helping visually impaired people lead independent lives after a bionic eye gave a blind Australian woman some sight.

Dianne Ashworth, who has severe vision loss due to the inherited condition retinitis pigmentosa, was fitted with a prototype bionic eye in May at the Royal Victorian Eye and Ear Hospital. It was switched on a month later, and today researchers revealed the results.

'It was really funny when it switched on. I was waiting, waiting,' she said. 'I had these goggles on and I didn't know what to expect, and I don't know if anyone did know what I was going to see. Then, all of a sudden, I went "yep" – I could see a little flash and it was like a little, I suppose, a splinter. There were different shapes and dark black, lines of dark black and white lines together. Then that turned into splotches of black with white around them and cloud-like images. I can remember when the first bigger image came I just went "Wow", because I just didn't expect it at all, but it was amazing.'

The bionic eye, designed, built and tested by Bionic Vision Australia, a group of researchers supported by the Australian government, is equipped with twenty-four electrodes with a small wire that extends from the back of the eye to a receptor attached behind the ear. It is inserted into the space next to the retina within the eye.

'The device electrically stimulates the retina,' said Dr Penny Allen, a specialist surgeon who implanted the prototype. Electrical impulses are passed through the device, which then stimulate the retina. Those impulses then pass back to the brain, creating the image. The device restores mild vision, where patients are able to pick up major differences and edges, such as light and dark objects. Researchers hope to develop it so blind patients can walk independently.

'Di is the first patient of three with this prototype device, the next step is analysing the visual information that we are getting from the stimulation,' Allen said.

The operation itself was made simple so it can be readily taught to eye surgeons worldwide. 'We didn't want to have a device that was too complex in a surgical approach that was very difficult to learn,' said Allen.

According to the World Health Organization, 39 million people around the world are blind and 246 million have low vision. ■