longest five hours Eytan's first word

DAVID POOLE / CORBIS

The inner ear's key to sound

The cochlea is a part of the inner ear which is lined with hair cells. Noises cause these tiny hairs to vibrate, stimulating the auditory nerve and sending messages to the brain, where they are interpreted as sound. In most profoundly deaf children, the hair cells are damaged.

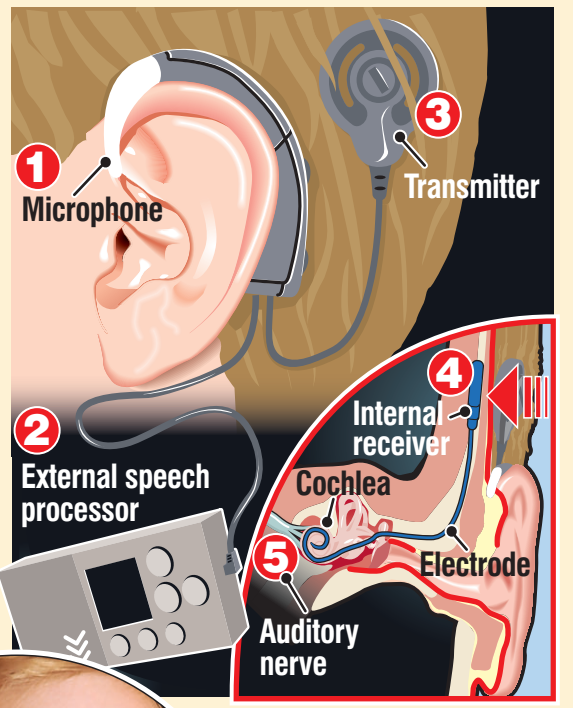
A cochlear implant works by stimulating the auditory nerve directly, through an array of electrodes inserted into the cochlea, bypassing the hair cells. The implant system consists of several parts.

1 The microphone (which looks like a hearing aid) is worn behind the ear and picks up sound.

2 The sound is then converted into digital signals in an external speech processor the size of a pager, clipped to the clothes.

3 & 4 These signals are sent electrically via a transmitter to an internal receiver which is inserted under the child's scalp. The signals create a tiny electrical current that travels down the electrode and…

5 stimulates the auditory nerve, which carries signals to the brain.



LISTENING IN: Eytan has a microphone behind each ear

implants – one for each ear. 'Having bilateral implants helps a child to localise the source of sounds better, improves balance and is more cost-effective than two separate surgeries,' says Dr Rajput.

But the local primary care trust refused to fund the procedure, saying they'd pay for only one implant. This is a common problem. Fitting a single cochlear implant costs the NHS about £45,000 – the cost of the implant itself and the complex surgical procedure to fit it. Bilateral implants cost about £70,000.

'There is a postcode lottery problem which particularly affects adults recommended for implants, but also some children,' says Philippa Palmer, director of healthcare programmes for the Royal National Institute for Deaf People (RNID). 'Obtaining funding for bilateral implants is a particular problem.'

In September the Government's independent adviser on health, the National Institute for Health and Clinical Excellence, will report on cochlear implants.

'We're fairly confident it will rule in favour of providing unilateral implants on the NHS,' Palmer says. 'But we're not sure about bilateral. There is widespread research evidence supporting cochlear implantation and its positive effects on quality of life, and the fact it is cost-effective. Bilateral implantation is now routine in Europe, but it's not done that often in the UK.'

After a two-month battle, the primary care trust caved in and agreed to pay for Eytan's operation. At just 15 months old, he went through the five-hour surgery. 'It was the longest five hours of our lives,' says Ravit. 'It was a great success, with both cochlear implants in perfect working order. Eytan recovered very quickly.'

The implants are switched on in stages over a period of several months, so that the audiologist can find the optimum level of effectiveness and comfort for the child.

'After the initial switch-on, Eytan responded to very loud sounds,' says Ravit. 'For the first time he would turn his head if someone knocked on the door, which was fantastic to see.

'Sounds are new to Eytan and it takes time for his brain to interpret them.

'But it is obvious that he loves hearing them – I can see his eyes widen every time he hears a new one, and he will smile.

'It is very difficult to pinpoint the exact level of hearing Eytan now has, but we know he is able to hear all speech sounds, even the tricky ones like "s" and "f", which we find hard. In fact, his hearing is now better than mine, Jeremy's or Chantelle's.

'Jeremy would probably benefit from a cochlear implant too, but he has coped well and, after so many years of wearing hearing aids and lip-reading, having an implant would be a difficult adjustment.'

According to Dr Rajput, Eytan's progress since the operation has been excellent: 'He's been doing all the things we expected: listening for sounds, responding to speech and starting to babble again. We have very high expectations for his future.'

Ravit says the implants have made a big difference to all their lives. 'Chantelle gets very excited every time Eytan tries to say a word. She has definitely bonded better with him since the implants.

'We have no regrets. I can't underestimate how positive the operation has been. Eytan now responds to his name – he even plays better because he can hear toys that make noises.

'He loves it when I sing nursery rhymes and do the actions. He's taken an interest in books and enjoys being read to. 'If I say, "Where are your shoes?", he points to them. He is understanding more words each day.

'Before the implants, none of this happened, or was ever likely to. We are overjoyed.'

DOCTOR DOCTOR

Q Can I request a home visit from my GP?

A Yes, GPs do home visits but only in specific situations such as for the elderly, housebound or for those too ill to get to the surgery. You need to phone your surgery early to request one.

All sorts of things you need to know about liquorice

Think of liquorice and images of brightly coloured chews or the black 'shoelaces' you used to eat at school are likely to spring to mind. But liquorice comes in all kinds of medicinal forms too – pills, powder, tincture, syrups and even tea.

It's been a popular ingredient in traditional Chinese medicine for thousands of years, mainly as a demulcent – a soothing, coating agent – to help with coughs and sore throats. The Chinese also used it to treat conditions ranging from diabetes to tuberculosis.

Today, the herb is still used to treat common conditions such as asthma and eczema but some anecdotal evidence suggests it can help more serious illnesses such as chronic hepatitis, diabetes and even HIV.

'Liquorice has a lot going for it,' says nutritional therapist Antony Haynes who, for the past 12 years, has researched the health benefits of Glycyrrhiza glabra – liquorice's botanical name.

'I've personally used it only to treat patients with chronic fatigue, gastro-oesophageal reflux or liver damage. But there's some research to show that it's good for those with colds because it has anti-bacterial properties, asthma and eczema because it has anti-inflammatory properties and even the Epstein-Barr virus and HIV as it's thought to help boost the immune system and therefore combat viral infections.'

The Herpes Viruses Association found recently that a liquorice extract lip balm was more effective in reducing the severity and duration of cold sores than conventional treatments.

There are two liquorice extract products favoured by nutritionists – standard and deglcyrrhizinated (DGL), which is prepared without liquorice's main active compound glycyrrhizin. While DGL helps to soothe and heal the stomach, the standard form of liquorice is used to increase the hormone cortisol in the blood.

'Cortisol is produced by the adrenal cortex and is involved in the body's response to stress,' says Haynes. 'It increases blood pressure and sugar levels, so if you're low in it, you will be tired, your metabolism will be slow and you'll have low blood pressure and low energy. Nearly everyone who is tired has low levels of cortisol, but for those who do – and it can be measured accurately with a simple saliva test – liquorice is an excellent remedy.

'Our cortisol levels are highest in the morning. Over the course of the day, the hormone is broken down naturally by enzymes. But liquorice inhibits the enzyme that breaks down cortisol, giving the person more energy.

'Most of my patients have increased their blood pressure by the use of liquorice, which is not a bad thing for those with low blood pressure.'

Half a teaspoon of liquorice solid extract should raise cortisol levels to normal. But big doses may cause hypertension, headaches, muscle cramps, cardiovascular problems and water retention.

'Anyone with high blood pressure or who is pregnant should not take liquorice,' warns Haynes.

Caroline Bellamy