

# Auditory brain stem implants

Understanding NICE guidance –  
information for people considering the  
procedure, and for the public

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### **Auditory brain stem implants**

#### **Understanding NICE guidance – information for people considering the procedure, and for the public**

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#### **To order copies**

Copies of this booklet can be ordered from the NHS Response Line; telephone 0870 1555 455 and quote reference number N0793.

A version in Welsh and English is also available, reference number N0794. Mae fersiwn yn Gymraeg ac yn Saesneg ar gael hefyd, rhif cyfeirnod N0794. The NICE interventional procedures guidance on which this information is based is available from the NICE website ([www.nice.org.uk](http://www.nice.org.uk)). Copies can also be obtained from the NHS Response Line, reference number N0792.

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## About this information

This information describes the guidance that the National Institute for Clinical Excellence (NICE) has issued to the NHS on auditory brain stem implants. It is not a complete description of what is involved in the procedure to put an implant in place – the patient’s healthcare team should describe it in detail.

NICE has looked at whether auditory brain stem implants are safe enough and work well enough to be used routinely for the treatment of total deafness that has happened because of specific nerve damage (see page 5).

To produce this guidance, NICE has:

- looked at the results of studies on the safety of auditory brain stem implants and how well they work
- asked experts for their opinions
- asked the views of the organisations that speak for the healthcare professionals and the patients and carers who will be affected by this guidance.

This guidance is part of NICE’s work on ‘interventional procedures’ (see ‘Further information’ on page 10).

## About the auditory brain stem implant

Sound signals are carried from the inner ear to the brain by the vestibulocochlear nerve. If this nerve becomes damaged during surgery or because of a tumour, the ear becomes deaf. If the nerves running from both ears to the brain are affected, the person becomes totally deaf. Hearing aids and cochlear implants don't help.

With a cochlear implant, electrodes are implanted into the inner ear. These pick up signals from a sound processor that's worn outside the ear or clipped to clothes, and send them to the vestibulocochlear nerve. The reason they don't work for this group of patients is that the signals aren't sent in far enough to bypass the damaged nerve.

The auditory brain stem implant uses similar technology, but the electrodes are placed into the part of the brain that processes sound signals (so the nerve is bypassed). As with the cochlear implant, sounds are converted to electrical signals by a sound processor worn outside the ear, and it's these signals that are picked up by the electrodes in the brain.

If the person's condition is caused by a tumour, this will often be removed at the same time as the implant is put in place. Surgery involves

removing a small amount of bone from behind the ear so that the surgeon can put the implant into the specific site in the brain stem (the brain stem is at the bottom of the brain – it's the area that connects to the spinal cord).

## **How well it works**

### **What the studies said**

In one study that followed what happened in 88 people who had auditory brain stem implants, 75 people had some sensation of hearing when the device was working. In another study, 51 out of 54 people had some hearing after they'd had the surgery.

### **What the experts said**

One expert said auditory brain stem implants gave unpredictable results.

## Risks and possible problems

### What the studies said

From the studies, the main problems following surgery were:

- leakage of cerebrospinal fluid (the fluid that bathes the brain and spinal cord) – this happened in 2 people out of 61
- meningitis (where the lining of the brain becomes inflamed) – this happened in 1 person out of 61
- blood clot on the lungs (the medical term is pulmonary embolism) – this happened in 1 person out of 54.

In one study, some patients said they had a tingling sensation in their bodies when the implant was in place. Another study said there were no serious or severe problems with sensations in the body.

### What the experts said

The experts listed the following as potential problems: damage to other nearby nerves, blood clot inside the skull or blocking the blood supply to the brain stem, meningitis, and infection around the implant.

## What has NICE decided?

NICE has considered the evidence on auditory brain stem implants. It has recommended that when doctors use auditory brain stem implants for total deafness caused by damage to the vestibulocochlear nerve, they should be sure that:

- the patient understands what is involved and agrees (consents) to the treatment, and
- the results of the procedure are monitored.

NICE has also recommended that if a person is going to have the procedure, it should be carried out by a surgical team that is experienced at doing it.

## Other comments from NICE

The procedure is suitable for only a small number of people, as damage to the vestibulocochlear nerve is rare. To date, only a small number of people have had the procedure in the UK.

Long-term information is needed about how well the implants work and their safety. This information is not available at the moment because the procedure is new.



## What the decision means for you

Your doctor may have offered you an auditory brain stem implant. NICE has considered this procedure because it is relatively new. NICE has decided that the procedure is safe enough and works well enough for use in the NHS. Nonetheless you should understand the benefits and risks of having an auditory brain stem implant put in place before you agree to it. Your doctor should discuss the benefits and risks with you. Some of these may be described above.

## Further information

You have the right to be fully informed and to share in decision-making about the treatment you receive. You may want to discuss this guidance with the doctors and nurses looking after you.

You can visit the NICE website ([www.nice.org.uk](http://www.nice.org.uk)) for further information about the National Institute for Clinical Excellence and the Interventional Procedures Programme. A copy of the full guidance on auditory brain stem implants is on the NICE website ([www.nice.org.uk/IPG108guidance](http://www.nice.org.uk/IPG108guidance)), or you can order a copy from the website or by telephoning the NHS Response Line on 0870 1555 455 and quoting reference number N0792. The evidence that NICE considered in developing this guidance is also available from the NICE website.

If you want more information on hearing problems, a good starting point is NHS Direct, telephone 0845 4647, or NHS Direct Online ([www.nhsdirect.nhs.uk](http://www.nhsdirect.nhs.uk)).

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