

# Middle ear implant (MEI)

Department of Audiology

Information for Patients

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## Introduction

A middle ear implant (MEI) is implanted in the middle ear. It mechanically transmits sound to the inner ear via the bones of the middle ear. It is meant for people who are not able to use hearing aids for medical reasons.

MEI bypasses the abnormal outer ear and / or abnormal ear canal to directly stimulate the bones of the middle ear.

The MEI system consists of 2 main parts, an external part and an internal part.

- **The external part** is called the processor. It picks up sound from the environment, and transmits the signal across the skin to the internal receiver. It uses a magnet to hold it in position. The magnet inside the externally worn sound processor is attracted to the magnet inside the internal equipment to create an invisible connection between the external sound processor and the implant.
- **The internal part** is implanted during the surgical procedure and is completely under the skin. It consists of:
  - a receiver package including a magnet, and
  - an internal component which is attached in the middle ear to either one of the bones in the middle ear or placed in contact with the inner ear (cochlea) directly.The internal component converts the signal into vibrations. It transmits them to the middle ear bones and adds extra movement to fluids in the cochlea (part of the natural hearing pathway).

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## How does the middle ear implant work?

1. A microphone in the external part picks up sounds and sends the signal to the sound processor.
2. The sound processor in the external part sends the signal across the skin to the internal implant.
3. The internal implant converts the signal into vibrations and transmits them to the middle ear bones, which then vibrate the inner ear directly.
4. The inner ear is stimulated, stimulating the auditory nerve.
5. Nerve impulses are sent to the brain where they are interpreted as sound.

## Who is suitable for a middle ear implant?

People suitable for a middle ear implant may include:

- those with hearing problems in the outer, middle or inner ears.
- those who are unable to wear conventional hearing aids due to certain types of ear infections, skin problems or ear mould allergies.
- those who are unable to wear conventional hearing aids due to ear abnormalities such as bony growths in the ear canal or a very narrow ear canal.
- those referred for a MEI assessment with hearing loss in one or both ears, and not getting significant benefit through conventional hearing aids.

## What are the benefits of using a middle ear implant?

- Reducing the risk of ear infections or skin problems.
- More natural sound quality.
- Lack of 'feedback' that happens with conventional hearing aids.
- Less distortion of sound.

## What are the risks?

The middle ear implant surgery is done under a general anaesthetic. You will be asleep for the surgery. Every operation carries risks and possible side effects. The chances of these happening are very small and many only last a short time after surgery. These may include:

- wound infection (less than 1 in 20 chance).
- bleeding from wound (patients may develop a small collection of blood (hematoma) under the wound, needing drainage, but major bleeding is unlikely).
- dizziness/ feeling sick (nausea) / being sick (vomiting) (variable but short lasting).
- tinnitus (ringing in the ears).



- weakness in the facial muscles (less than 1 in 1000 chance).
- taste disturbances (uncommon).
- leak of the fluid surrounding the brain (cerebrospinal fluid) (unlikely).
- implant failure (1 in 10 implants may not work due to mechanical reasons).

We are able to monitor many of these during surgery or to treat them immediately afterwards.

## Will I be able to hear normally after having the implant?

Middle ear implants do not bring back normal hearing, but you should be able to hear sounds you were not able to hear with hearing aids.

You will need time to adjust to the new sounds. It is not possible to predict how well your listening skills will develop. You will be provided with the appropriate training and support to have the best chance of success.

We will discuss your expected outcomes with you during the pre-operative assessment. To find out more, please ask your ENT consultant.

## More information

Watch a video explanation of how middle ear implants work:

YouTube video (video by MED-EL)

How the SOUNDBRIDGE works with SAMBA Audio Processor

[https://www.youtube.com/watch?v=khvrHgSFI\\_8](https://www.youtube.com/watch?v=khvrHgSFI_8)

## Contact details:

Consultant's secretary 0116 258 6211

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