TIME IT RIGHT!

While the decision to have a cochlear implant should never be rushed, putting it off for too long may affect the outcome. But what is too long? And is it a case of better late than never? Madeleine Bailey investigates

Any life-changing step, whether it’s starting a family, moving home or opting for a medical procedure, should only be undertaken after thorough research and consideration. However, with cochlear implants (CIs), it’s important to avoid unnecessary delays as timing and duration of deafness can have considerable impact on the results. This applies both to young children and adults.

An early start

For very young children, age at implantation is key. The consensus view among researchers and hearing experts is that CIs produce the best results when they are implanted before children reach about three years of age. Jennifer Robinson, audiologist and senior product manager at MED-EL, Austria, explains, “During the first few years of life, the brain is at its most adaptable and ready to receive and interpret sound. But if the auditory pathways – the parts of the brain normally assigned to hearing – are not stimulated in the first three or four years, the brain will begin to reassign them to other senses, such as vision. This limits capacity for hearing, and also delays speech and language development.”

This is because children learn to speak by copying what they hear. The process starts as early as four months, when babies
begin to babble, so any delay in hearing can impact on speech. Naturally, this affects development of language – the ability to use words to communicate. In fact, the latest research suggests that for best results in language development, surgery should be carried out within the first year of life. According to a 2016 research review in medical journal ‘Otology and Neurotology’, “Children receiving CIs before 12 months frequently catch up with their typically developing peers, whereas those receiving CIs later do not.”

**Domino effect**

In turn, delayed speech and language impacts on reading skills. According to the World Federation of the Deaf, the literacy achievement of deaf children is far below the average for the whole population. And as reading is the gateway to learning, this can create a barrier to academic achievement.

However, research also shows that CIs can help redress the balance. In a 2009 systematic review by the UK’s National Institute for Health Research, profoundly deaf children with CIs, especially those who were implanted early, were found to substantially outperform non-implanted deaf children in areas such as sensitivity to sound, speech perception, speech production, quality of life and educational achievements. What’s more, the earlier children are implanted, the more likely they are to attend a mainstream school. In a 2013 US study that followed up implanted children after six years, 81 per cent of those implanted before the age of 18 months were in mainstream school full-time compared with just 63 per cent implanted at 36 months or older.

Yet the decision to have a child implanted isn’t always as clear-cut as it may initially seem. While research shows that it’s a relatively simple choice if you’re a hearing parent of a profoundly deaf baby, it’s not as straightforward if your child has some residual hearing or is already happily using sign language and lip reading.

**Older children**

So once those key years have passed, is it worth an older child having an implant? “Absolutely,” according to Jennifer Robinson. “Older children usually have to work harder with speech therapy than younger children and may never achieve the same level of speech and language as normal-hearing children their age, but there will still be benefits.”

The main one is that having a CI opens up a new channel of communication: “Having the ability to hear increases social
contact, makes learning easier and widens children’s prospects and life choices. It allows deaf children to participate more easily in mainstream society, with all the opportunities that brings,” she adds.

While there’s been very little research on the views of implanted young people, a small UK study by the Ear Foundation and National Deaf Children’s Association on teenagers with implants found that 27 of the 29 young people interviewed said they wore their implants all day every day and felt that they belonged to both the deaf and hearing worlds. None of them criticised their parents for having them implanted.

**What about adults?**

Interestingly, the duration of deafness is important for adults too, even among people who could once hear naturally. In fact, this seems to be more important than age – there is no upper age for implantation and the oldest person in Europe so far to receive a CI was 99!

Lendra Friesen, Assistant Professor in the Department of Speech, Language and Hearing Sciences at the University of Connecticut, USA, explains, “We know that the auditory part of the brain will begin to atrophy if it’s not stimulated and the longer the duration of deafness, the longer it will take for someone to learn to recognise and understand speech again after surgery.”

This is supported by research. A 2016 Australian study in the ‘International Journal of Audiology’ concluded that outcomes are better in people who lost their hearing as adults if the surgery is carried out earlier rather than later in the progression of deafness.

**Better late than never**

So, is it worth having an implant 10, 20 or even 30 years after becoming deaf? Unfortunately, there’s no hard and fast guide to how specific time periods of deafness will affect the success of implant surgery.

“There are lots of factors that affect the outcome of an implantation, and duration of deafness is just one of them. However it’s also important to add that, even if you’ve been severely deaf for some time but have worn a hearing aid and so kept the
auditory pathways stimulated to some degree, this will improve the chances of a good outcome,” says Professor Friesen.

Results can also be maximised by rehabilitation – a process that can take from six months to about a year in adults. “Understanding speech after surgery isn't automatic. The brain has to learn to interpret sounds using the implant,” says Professor Friesen. This consists of regular sessions with a speech therapist but also involves plenty of practice at home.

Quality of life

Interestingly, a 2014 study in Swedish medical journal ‘Acta Oto-Laryngologica’ on 81 adults who were implanted many years after losing their hearing, found that even those who had been deaf for up to 30 years experienced benefit and improved quality of life. However, those who had lost their hearing before adolescence fared poorly on understanding speech.

But according to Professor Friesen, there are broader issues at stake: “Untreated hearing loss can have wider repercussions on health. There's a lot of research that shows a strong association between age-related hearing loss and depression, risk of falls and even dementia.”

Depression is linked to the social isolation that often happens when communication becomes difficult. While the links with falls and dementia aren't yet fully understood, the theory is that the strain of trying to hear takes the brain's resources away from other tasks such as balance and cognitive functions.

As with any major decision, it's a case of weighing up the advantages and disadvantages – and these will vary to some degree between individuals.

Jennifer Robinson advises: “Do your research. Find a support group and talk to as many CI users about their experiences as possible. Then consider how your hearing loss is affecting your day-to-day life. For instance, is it becoming harder to manage everyday activities and how is it impacting on your social life, your work and those close to you?” Ultimately, the decision is a very personal one.