



NICE Reviews Implant Criteria

On 7 March 2019, NICE revised its guidelines on the criteria for cochlear implantation in a publication TA 566. This is the first change that has been made since NICE published, in January 2009, its guidelines, 'Cochlear implants for severe to profound deafness in children and adults'(TA166). Whilst those guidelines were very welcome at that time, eliminating the postal code lottery and funding problems, time has shown just how severe the criteria was; set at a hearing loss of 90 dB it was the highest level anywhere in the world. Rejection levels of potential candidates at implant centres across the UK have been known to reach 35% or more. Implantation levels have grown slowly in the UK and it is estimated that only 7% of those adults who could benefit from a cochlear implant actually get one. The latest figures for the UK are 17098 in total, cumulative over 25 years. For the year 2017/18 alone the figures were 1504 (995 adults and 509 children) whereas far higher levels (up to double or more) have been achieved in Europe and across the world.

Dismayed by this situation, in 2015 AGCI (Action Group for Cochlear Implantation) was formed by leading stakeholders, professional researchers, British Cochlear Implant Group and NCIUA. Led by Professor Brian Lamb, a series of authoritative reports (co- authored by Sue Archbold, The Ear Foundation) were published which were submitted to NICE together with research papers in order to press NICE to consider a review of the key section 1.5 of TA166 concerning cochlear implant candidacy. Pressure was maintained and NICE finally agreed to open a consultation in January 2018 to consider the issues of candidacy criteria. Backed by extensive and telling research from Dr Debi Vickers at UCL and Dr

Padraig Kitterick at the Nottingham Biomedical Research Centre, a complete consensus was agreed by the Group and a full submission made to NICE in July 2019.

NICE accepted all the recommendations so made and have revised the key criteria as follows:

“For the purposes of this guidance, severe to profound deafness is defined as hearing only sounds that are louder than 80 dB HL (pure-tone audiometric threshold equal to or greater than 80 dB HL) at 2 or more frequencies (500 Hz, 1,000 Hz, 2,000 Hz, 3,000 Hz and 4,000 Hz) bilaterally without acoustic hearing aids. Adequate benefit from acoustic hearing aids is defined for this guidance as for adults, a phoneme score of 50% or greater on the Arthur Boothroyd (AB) word test presented at 70 dBA and for children, speech, language and listening skills appropriate to age, developmental stage and cognitive ability.” (The full text of TA 566 can be seen at - <https://www.nice.org.uk/guidance/TA566/chapter/1-Recommendations>)

The significance of this dramatic development is that by lowering the hearing level test down to 80 dB, NICE have estimated that an extra 1600 more candidates in total will now be successful over the next 5 years. The change in the hearing recognition evaluation from the BKB sentence test to the new AB word test is considered to be a better test of real-world hearing.

This new guidance will be effective from June 2019 and the challenge now for ACIAG is to follow through to ensure that all implant centres expand their resources to give full effect to these new rules.

By Richard Byrnes

Implantable Microphones: an Alternative to External Microphones For Cochlear Implants

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Summary by Alison Heath

What do we need for an internal implant? Implantable batteries such as are used in pacemakers. They need to have a minimum charge and a long life. You cannot be changing batteries every day or even every ten years. They must also be sealed. The speech processing technology is easily implantable but the difficulty is upgrading the technology. It would be difficult to have a new processor with new technology. The remaining challenge is to produce a microphone that can pick up sound inside the human body and that is where research is focussed.

What are the advantages of this technology? Perhaps the most important is that it cannot be seen and therefore relieves the stigma of wearing a cochlear implant. It also overcomes problems such as inflammation of the skin under the processor, the implant being insecure especially where young children are concerned, difficulty in using it when swimming and not being able to wear the implant at night and so not hearing the baby monitor or the smoke alarm. In some professions it is useful or necessary to wear headgear and again the implant can be problematic. The pinna also has some useful functions in picking up and amplifying low frequency noise. The ear canal has a typical shape which amplifies high frequency sounds so the outer ear does provide a certain amount of amplification of natural hearing but this is lost if the microphone is outside.

There was some experimental work on subcutaneous microphone ten years ago but they did not work very well. Surgeons have tried putting microphones in different places - under the skin, in the ear canal, under deep canal skin and even inside the cochlea fluids so that they can detect the movement of the fluids as the input. Free floating microphones and ones that pick up the sound through the soft tissues have been tried but finally it appears that microphones linked to the little bones of hearing may be the way forward.

There are two totally implanted hearing systems on the market which are middle ear implants for people with a low level of loss. The Envoy

Esteem, an American device, has not really taken off due to surgical complications but it is interesting because it uses a microphone attached to the little bones of hearing. The Cochlear Carina is a more recent entrant on the market which stimulates the middle ear using a microphone under the skin. Patients say that they can hear but there is some loss of signal because the sound has to pass through the skin.

The problem with microphones under the skin is a reduced sound sensitivity though they can be adjusted to amplify sound it will never be as clear as with a microphone on the outside which is picking up sound directly through the air. Also another issue is that they tend to pick up noises and sounds of the human body such as breathing, chewing and eating sounds. For someone with normal hearing these sounds come through the internal sound pathways through the skull and are quite loud but with an implant user they are less obvious because the microphone is on the outside. However with a subcutaneous microphone the sounds are amplified and can interfere with what the individual is trying to hear.

The middle ear microphone takes the sound signal from one of the little bones of hearing so it is using sound that has already been amplified by the pinna and ear canal and, to some extent by the bones of hearing, so it is a more natural sound. But there are a number of technical issues that need to be considered and overcome if it is going to work. We need to find a method whereby we can use this microphone to get maximum output from that system. It must be biocompatible, it must be strong and able to function in what is a moving environment of the middle ear. If it is added to the mass of bones of hearing it reduces their ability to vibrate and reduces the input so coupling the microphone to the bones of hearing has to be done very carefully. The surgery with an implantable microphone needs to have a very low rate of complication. Ideally the microphone should not detect body noise to any great extent. The microphone also must have a relatively low energy requirement as it will be working in conjunction with an implanted battery.

An experimental device has been developed. Helped by the University of Keele, which set up a laboratory for the testing to be done, 40 cadavers have been used to find out how the device could be attached to the bones of hearing and the skull, and how body noise could be reduced. Conclusions were reached about how to attach the device to the bones of hearing by drilling a hole and using cement to fix it, and how to fix the microphone to the skull in a particular way to reduce the pick up of the internally generated body sound. Six volunteers, who were already cochlear implant users, were recruited so the non-implanted ear was used for testing and the microphone was placed in this ear. The sound picked up by the implanted microphone was compared with the sound produced by their cochlear implant. The study ran for six months and then the technology was removed. The volunteers received an implant donated by Cochlear in the test ear so they ended up with bilateral implants.

The testing was done by a variety of means: patients kept diaries which were carefully analysed; they attended sessions for speech

testing and directional hearing testing; and also filled out questionnaires about the quality of life. One volunteer found she could use the telephone much better with the implanted microphone. When the volunteers were given sentence testing there were very few and little differences between the implanted and external microphone.

Implantable technology seems to be the way forward but there are things that need to be done. The microphone needs to be smaller and attached to the skull in such a way that it can be used with children whose skull is growing. The surgery needs to be simpler and quicker so that surgeons operating anywhere in the world can use it.

What the study has demonstrated is that this technology works and will be an option for the vast majority of patients receiving a cochlear implant. The team involved are a group of audiologists, surgeons and administrative workers in Birmingham. They have links with Warwick, who provided some input, and Cochlear as well with the technology and development of the implant.

Manufacturer's News

From Cochlear

With summer on its way it's a great time to remind you of the accessories and services we offer that ensure you hear now, and always whatever you're up to this summer.

Aqua+

Being able to enjoy water is important and fun, and we help make sure there's nothing stopping you from enjoying water activities. That's why we have designed Aqua+ which transforms your Nucleus 5, 6, 7 or Kanso into a fully waterproof solution. For keeping fit in the pool, snorkelling at the beach or simply in the bath, Aqua+ will help you feel relaxed and confident that you can still hear what's going on around you.

For Kanso wearers, the Cochlear™ headband is an extra retention option that holds the Aqua+ more securely on the head. It has a built-in anti-slip strip and is available in a variety of colours.

Cochlear™ Travel programme

It would be stressful to be without your sound processor at any time, but more so if you are working abroad or away on holiday. The Cochlear™ Travel Programme means you don't need to worry about finding a local clinic or spending the rest of your trip in silence. With three plans to suit the needs of different travellers, we've got you covered.

Full backup plan

In the event of a trip to a remote country or perhaps you are travelling to an exotic location where our courier can't deliver, you may prefer to carry the backup sound processor with you. With our full backup plan, we send a mapped sound processor directly to you before you leave home. You can then enjoy your trip, knowing that you have a replacement sound processor immediately available if you need it. Cochlear Family members receive a 25% discount off this service.

Single trip plan

Don't risk your holiday being spoiled or your business trip being cut short. In the event of you losing or damaging your sound processor, we will ship a temporary replacement to you to ensure you are hearing again as quickly as possible.*

Annual cover plan

With our Annual Cover Plan, it doesn't matter how often you travel or how many

different destinations you visit. If you lose or damage your sound processor, we will ship a temporary replacement to you as quickly as possible.*

* Single Trip and Annual Cover Plans: in most cases, a temporary replacement sound processor would be with you within approximately two working days. However, exact delivery times vary by location and details are available on request.

From MED-EL

Cochlear Implants – Myths, hopes, fears, and one woman's journey...

Many people wonder if having a cochlear implant is the right choice, they have similar fears and share hopes and dreams about how an implant will affect their lives. What can they expect? What will happen? How will they feel before and after surgery?

Working with MED-EL, Vera, a MED-EL cochlear implant recipient, shares her personal journey from her pre-operative consultation, surgery and life following switch-on in a series of short videos.

The videos not only follow Vera's journey but also highlights the challenges and achievements on the road to hearing again. In her own words, Vera shares her experience of living with hearing loss and how she felt during each stage of her cochlear implant journey and beyond.

Vera

Vera started to lose her hearing in her early 20's and was told that her hearing would continue to deteriorate over time. At the age of 40 Vera started to wear hearing aids when she realised that she was having difficulty understanding speech. Vera was referred to the Yorkshire Auditory Implant Service in Bradford by the Audiology department when the hearing aids no longer helped. This is where Vera starts her video journal to share her experiences with others.

Episode 1 – The Decision

Episode 2 – The Surgery

Episode 3 – The Activation

Episode 4 – The Rehabilitation

Episode 5 – Life with a Cochlear Implant

Episode 6 – The final chapter due out soon!



To follow Vera's journey the videos can be found at www.medel.com/community/veras-journey

Accessibility, Apps and AI

Jesal Vishnuram, Action on Hearing Loss Technology Manager

CI manufacturers are focussing on accessibility and in particular, streaming audio from personal devices such as smart phones, tablets, PCs and TV directly into the processor. It used to be necessary to buy special devices and special mobile phones to deal with accessibility but now mainstream technology provides more accessibility. There is a whole kind of criteria for them to fulfil when it comes to accessibility needs. Instead of the loop kind of streaming there is now Bluetooth streaming.

A lot of work is being done around speech-to-text. We are trying to encourage companies not only to make the technology accessible for people with hearing loss but also to consider hearing loss when they are developing the technology. Microphone signs on tablets and phones mean that if the sign is pressed when you talk into the devices it should translate into text. This is very limited. Skype is now not only available on PCs but also on apps which can be downloaded to smart phones. Subtitles are also available on Skype. They were developed to overcome language problems for businesses but can also be useful for people with hearing loss.

Video Services

Skype
Not just video calling anymore - instant messaging, voice calls, video calls and video messages
Not just on PC/laptop anymore - app on phones and tablets on all platforms

1. Settings

2. Select language

3. Activate translation

ACTION ON HEARING LOSS
A national charity since 1911

The BT Next Generation Service is great but it also has a lot of limitations and is not very user friendly. We are trying to improve it. We have a longstanding relationship with Geemarc which is responsible for manufacturing amplified telephones. The company have a huge history in working in the Telecom sector so we have worked with them on the speech-to-text app. It is called 'Text Hear' and is available on Android for Samsung, Sony, HTC and Google and iOS so for your Apple devices. They use a Google translation service which is free if you have an Android device but expensive if you have an Apple device.

The good thing about working with Geemarc is that they understand that having a solution is more important than software. You need something you can physically use so what they have developed as a start is a phone adaptor which can be plugged into your landline phone at home. It attaches to your smart phone or tablet and then on the software you can see a translation of the phone call. The development of this device is in the early stages. It is a quite complicated device in terms of making sure that accuracy and speed works, but it is the starting point of creating an actual end user product.

Another device we are working on is for loop systems. There is a microphone which allows the audio through the loop to be heard but it would be better if there was also speech-to-text software so that what is heard on the loop could also be read.

There are also other apps being developed with other companies working in this area such as alerting devices which will work when the user is away from home. There is DeafWake which uses the microphone of your device to pick up sounds around you and alert the deaf person through their phone, through vibrations or the flashing light on their camera. So it uses other things that people normally carry to alert them. We are also looking at the transport area so that when announcements are made on trains there are alerts for people with a hearing loss as well.

It is hard to get these big companies to do something just because it is the right thing to do. We are trying to work out what the general trends are and to really try to influence these companies to do something. People, who do not have a hearing loss, do not always want audio which means that we are asking for something that everyone wants but we do need to ensure that anything created meets the needs of people with a hearing loss as well. There are lots of apps popping up which allow you to call a taxi or order food so that you don't have to talk to anyone or hear them over the phone. This is part of a trend where the needs of people with hearing loss can be met by developments that help other people as well.

Accessing Services

Uber
Free app to order private minicabs - get a quote and order minicab without having to speak to anyone over the phone. Automatically finds your location or alternatively you can type in a location yourself if it's from a different location to where you are and you type in your destination. All payments are done through a registered card on the app and therefore there is no confusion about payment through difficulties with being able to hear the driver.

Food orders/deliveries
Deliveroo, Just Eat, Uber Eats now provide an easy and simple way to order a take away without having to speak to someone on the phone from restaurants who don't have their own delivery service.

The popularity of apps and easy access to services, entertainment and healthcare is a growing trend

Another exciting area of speech-to-text is what is called augmented reality. This is basically is something that is happening in the real world but you have an image that is superimposed on to it. For example when you wear glasses you can see everything around you but you could have text superimposed on your glasses so that when something is happening in audio you can see the text translation that might help you pick up anything you have missed.

The National Theatre has been working on a trial using the technology at their theatre productions; the production is seen normally through a pair of these glasses but underneath the subtitles appear. It is paired with a simple device and, hopefully, when you click on it there will be a choice of languages for the text and also the possibility of controlling the size and colour of the text. We have also been trying to see if we can work in a cinema setting as well but it is more difficult. It is important to get users involved at an early stage so that these developments really meet their requirements.

AI or Artificial Intelligence is another exciting area. Traditionally it was used to stimulate problem solving abilities but it has grown into something bigger and more complicated. These systems can now, like us, learn from experiences so they make errors but they learn from these and eventually create

something better if not perfect. A lot of work is going on around how to improve speech in noise in cochlear implants and hearing aids. When there is a lot of noise the biggest limitation for speech-to-text is picking up the speech you want to hear and ignoring all that background noise. This means that there is a whole library of background noise and all that can be registered as noise and the systems know how to ignore background noise and learn to listen to the speech. Hopefully things like this will improve accuracy.

Another area of research is lipreading. If lipreading patterns can be linked to the audio that is being heard that again will provide a real kind of next stage in improving the accuracy of those translations.

To go back to Action on Hearing Loss and what we are doing in this area. Just over a year ago we launched our Technology Initiative for Hearing Loss and this has become a really big part of our work and will continue to grow. We know it is important to engage with users, work with them and make sure we know what they want and then we go back and talk to the developers and academics and tell them what is wanted. We have created five themes which are felt to be priority areas and speech-to-text is very much one of them. We are trying to find ways to support the developers and keep them motivated to work in this area and create solutions. A big part of this is putting them in touch with users. Hopefully we will increase the uptake of technology and increase awareness of them among users and those working with them.

It would be really great if anyone interested in trying any kind of technology, in working with developers would get in touch with us. You can either email: TechUCLab@hearingloss.org.uk or you can contact us through our website and basically be a big part of testing any technology available that you feel you would really like to get into.

Catch-up TV is finally going to catch-up!

Most people with hearing problems (and quite a few people with normal hearing) struggle to follow the sound track on TV programmes, and rely on the availability of subtitles to allow them to access TV on relatively equal terms. We are fortunate that in the UK we have a very good track record on TV subtitling, which owes a lot to the campaigning efforts of the NCIUA's founding President, Lord Ashley of Stoke. We have for many years had legislation which has been interpreted by Ofcom in ways which ensure that the great majority of broadcast TV is provided with subtitles. Some of the time the subtitles fall short of perfection, but most of them are perfectly serviceable.

However if your life style is such that you want to watch your favourite shows on Catch-up TV [or Video on Demand, to use the official terminology] you will in most cases have to do so without subtitles. The one shining exception is the BBC iPlayer service, which was specified from the outset with subtitle delivery as an integral part of the product. So if you watch programmes on iPlayer [either on a Smart TV or a laptop or tablet computer] you should have no problem with the subtitles, but if you try using the commercial Catch-up services offered by ITV, Ch4, Ch5 etc you will normally have to manage without subtitles.

This sad state of affairs reflects the fact that Video on Demand services are regulated under different legislation to that covering Broadcast TV, and prior to the enactment of the Digital Economy Act 2017 Ofcom weren't able to specify subtitling [and signing] quotas in the way they have for many years for Broadcast TV. The good news is that Ofcom have now published proposals in which they set out their intentions to require subtitles to be provided on the bulk of the output of the major Video on Demand services over the next few years https://www.ofcom.org.uk/data/assets/pdf_file/0014/131063/Statement-Making-on-demand-services-accessible.pdf

Specifically Ofcom propose that:

- a) Within 4 years of the regulations coming into force, on-demand programme service providers to offer subtitling on 80% of their catalogue, audio description on 10% and signing on 5%.
- b) An interim 2-year target of 40%, 5% and 5% respectively.

So we can't go celebrating just yet, but it looks as if within a few years we will be able to access Catch-up TV broadly on a par with our hearing peers.

Paul Tomlinson

Autumn Regional Meeting in Southampton

On 3 November 2018 the NCIUA's Autumn Regional Meeting was held at the University of Southampton Auditory Implant Service by kind permission of Prof. Carl Verschuur, director of USAIS. It was attended by both implant users and candidates with their supporters. The theme of this very successful meeting was Communications and how the various features and accessories of cochlear implants can help us in difficult listening situations. Held in conjunction with the Southern Counties CI (UK) Group, an enthusiastic audience of over 40 people heard presentations from Advanced Bionics, Cochlear UK, and MED-EL. There was also a presentation by Dr. Helen Cullington on the development of a remote care pathway entitled CHOICE.

Sandra Watson, of Southern Counties, said "I am very grateful on behalf of our members for the an opportunity to speak to all of the manufacturer representatives who were very helpful and managed to resolve many of our technical issues. One of our members finally got his phone paired to his phone clip with their help and made his first very successful call to his son! The CI candidates could also do their research as there were lots of models on display and loads of information leaflets".

For more information about the South Counties CI (UK) Group and other support groups see: <http://www.nciua.org.uk/about-us/regional-groups>



Sandra Watson, Caroline Jefferson, Sarah Taylor and Richard Byrnes

DIARY DATES

The 2019 Summer Meeting and AGM will be held on Saturday 8th June 2019 at the University of London (Birkbeck Main Building), Torrington Square, London WC1E 7HX.

**Watch our website for more up to date information:
www.nciua.org.uk/events**



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Disclaimer

Whilst the Association uses its best endeavours to provide accurate information on the subject of cochlear implants it does not provide medical advice or make recommendations with regard to any particular implant or equipment and no article in this newsletter should be construed as doing so.

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