



Tinnitus research and CIs: Presentation given at the Summer Meeting 2011

Phil Gomersall (Audiological Scientist) and Sue Fields (Specialist Speech and Language Therapist) with thanks to Joanne Muff (Audiological Scientist) from Audiology Department, Addenbrookes Hospital.

Phil explained that although he worked in the audiology department and not directly with cochlear implant users he was doing a research project at the MRC Cognition and Brain Sciences Unit in Cambridge which is looking at tinnitus and implants. Sue works in the Emmeline Centre along with her colleague Joanne Muff who could not be present but helped to prepare the talk.

Tinnitus is defined as 'a conscious perception of sound that cannot be attributed to an external sound source'. Everyone at some stage in their life has experienced some internal noise but pathological tinnitus is so troublesome and lasts so long that it causes problems. Many cochlear implant users will have experienced tinnitus which is commonly associated with hearing impairment. It usually improves after the operation but there are variations in the amount of relief gained.

It is thought that the most common origin of tinnitus is within the inner ear (cochlea) but it is important to know that the link between the cochlea and the brain is not direct; the hearing nerve has to go through a number of junctions, some of which are like 'signal boosters'. What makes the picture even more complicated is that information in the nerve travels back down the system as well, so there is a continuous flow of information in the nerves up and down between these junctions.

Even in complete quiet there is always background activity – hearing is not just about having a signal sent straight to the hearing part of the brain. This background activity, instead of being completely turned off and on, is actually turned up and down by sounds. It is never completely silent within the nerves of the brain. This means that there must be some filtering mechanism in the hearing part of the brain differentiating between what is real sound and what is just background nerve activity.

With a hearing loss the supply of sound is reduced, but background activity remains. The filtering process is still



Sue Fields and Phil Gomershall

needed to cut out background activity but it is probable that some of the normal control between information going up and down is lost when the information is not coming from the ear. This may be one of the reasons strange sounds are perceived in the hearing part of the brain – the system is no longer under proper control. It is also possible that in people with severe hearing loss the brain itself re-organises in a way that may make tinnitus occur. Why are some people troubled by it and not others? The thinking part of the brain can filter out sounds it deems unimportant, however the tinnitus sound can readily become classified as 'important' and therefore be given greater attention, especially if associated with stress and anxiety.

An implant which provides more normal information for the hearing system may help to restore control allowing the hearing part of the brain to filter out sounds as it normally would or causes the brain to re-organise in a more normal way. However neither implants nor hearing aids are the ultimate solution. The tinnitus may remain. If this is the case there are some programming strategies for the implant or hearing aid that may help (see diagram 1).

Further relief may be provided by the production of competing sounds which cover up the internal noise. This is called auditory masking. A traditional way of using masking to help people with tinnitus is to provide

DIARY DATES

NCIUA regret to announce the planned Forum Meeting on 12th November 2011 will not now go ahead. We apologise for any inconvenience caused. Details of the Summer Meeting 2012 will soon be available.

Programming Issues

- Fit contralateral hearing aid if possible
- Consider disabling any noise reduction parameters such as Clearvoice, Autosensitivity, Beam or Focus
- Volume control enabled
- Sensitivity control enabled
- Input Dynamic Range expanded
- Artificially raising Ts
- Consider disabling troublesome electrodes



Addenbrooke's Hospital NHS
Cambridge University Hospitals NHS Foundation Trust

Diagram 1

background white noise (a continuous hissing or 'shushing' sound). The knowledge that the sound is coming from an external source can relieve some of the anxiety of constantly listening to internal noise. This is called information masking. Having external noise is also a form of distraction and can reduce the 'starkness' of the tinnitus, which can help habituation. However, some people find listening to white noise as irritating as listening to the tinnitus itself.

My research is focussed on a specific type of sound therapy which is commonly used with people who have acoustic hearing where background noises such as rain or the sound of the seashore can be used to help break the tinnitus cycle of anxiety as well as providing the benefits of masking without the need for white noise. The problem is that, due to the way a cochlear implant works, these sounds may not be very pleasant for implant users so my aim is to find ways and means of making the sound pleasant enough for implant users to get the same benefits as people with acoustic hearing. In addition to these acoustical approaches the fact that tinnitus is strongly linked to emotions and attention means that some counselling and advice on coping strategies can really help (see diagram 2).

Therapy

Sue Fields said her role as one of the adult rehabilitationists in the cochlear implant team was to work with the audiologists to ensure that their cochlear implant users get the best possible outcome from their implants. As cochlear implants have improved and also outcomes it has been possible to focus on other matters one of which has been tinnitus.

Patients are given questionnaires to fill in pre implant, three months and one year post implant so that how tinnitus changes can be monitored. Generally speaking most people find their implant improves the situation, but if troublesome tinnitus persists the first step is to go back to the audiologist to ensure that the implant is optimally programmed. A contralateral hearing aid may be considered because putting some sound back into the auditory system may reduce the impact of tinnitus.

After this coping strategies may be tried. When the filtering system is working normally it brings sounds we need to hear to our conscious awareness but is able to block out others. Such sounds can be related to events in the environment but tinnitus is disturbing because it is internal and cannot be linked to any external sound source.

In therapy sessions patients are encouraged to talk through their experiences with tinnitus and to understand what it is. The problems start when tinnitus takes control and overwhelms the sufferer. They become fearful of getting into situations where they start to experience it and tinnitus begins to take control of their life. Strategies are suggested, such as changing lifestyle, to regain control so that it can be moved out of conscious awareness which is what is meant by habituation.

Sue mentioned that the British Tinnitus Association has a lot of useful information on their website. There also produce many interesting factsheets such one about sleep which they call 'sleep hygiene'. There are also DVDs with nice sounds such as waves on beaches, birds singing but, as it is different listening through a cochlear implant, some users may not find them helpful.

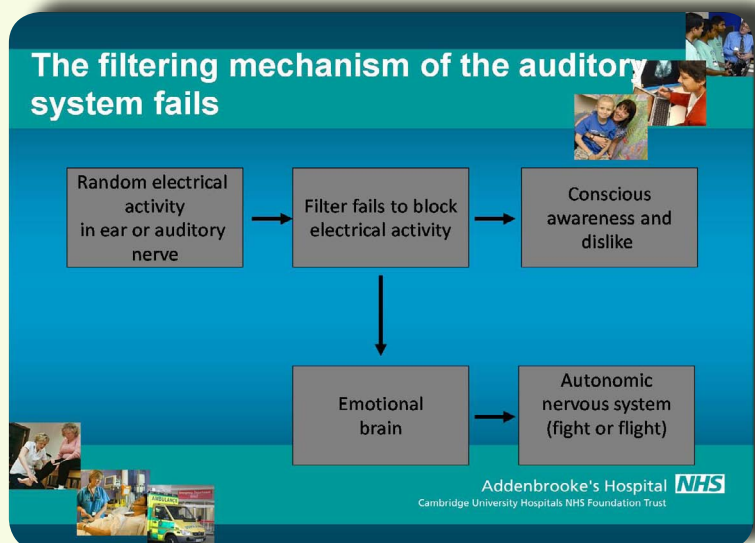


Diagram 2

THE DEACON

During the afternoon session of the Summer Meeting members enjoyed a performance of 'The Deacon' a musical especially written for cochlear implant users by Zack A. Moir. This contemporary musical set in the 18th century is about the life of Deacon Brodie a cabinet maker who rose to be a councillor and respected member of his community but, disappointed in not being able to have a more adventurous career, led a double life and became a notorious criminal by night. Eventually he was unmasked and finished up on the gallows.

The performance was introduced by Geoff Plant a rehabilitation specialist from Boston who works for MED-EL UK which sponsored the musical. The story is told through musical sequences and songs, the words of which were projected so everyone could follow the story. The music is a fusion of rock, jazz and folk music. The performers included folk singer Findlay Napier, guitar/banjo Sean McLaughlin, cello Justyna Jablonska, tenor saxophone Zack A. Moir, bass Garry Boyle and percussion Richard Kass. Most members appeared to find the performance highly entertaining and enjoyed the music. We were asked to fill in a questionnaire afterwards so that we could give our re-actions to the performance.



The afternoon was concluded with Auld Lang Syne led by the band with some members joining in heartily.

More information about music and cochlear implants can be found on the website: www.ci-music.scene.co.uk

From Cochlear™ – Tips about batteries

Why power up with PowerOne Implant Plus?

Cochlear™ recommends PowerOne Implant Plus disposable batteries for a longer battery life for cochlear implants than that delivered by some hearing aid batteries

Some hearing aid batteries do not have the required amount of power for cochlear implants. As a result, the battery life is often much shorter than Cochlear's recommended PowerOne Implant Plus disposable batteries. The PowerOne Implant Plus batteries offer the optimal amount of power needed for cochlear implants. Therefore, a cochlear implant recipient experiences longer battery life.

Using disposable vs. rechargeable batteries

Using either kind of battery depends on your lifestyle and preferences. We find that many of our customers use both or switch back and forth between the two. For example when traveling, consider taking the disposables so you don't have to carry chargers. Disposable batteries can last one to three days longer than rechargeable batteries. On the other hand, using rechargeable batteries help increase your sound processor's water resistance. Opting for the mini rechargeable batteries decreases the size and weight of the sound processor, which may be ideal for children and make the processor more discreet. Isn't it nice to have both options!

Battery recycling

You have the option to recycle your non-rechargeable zinc-air batteries. Most non-rechargeable zinc-air batteries do not contain hazardous materials that will harm the environment after use, and are safe to dispose of in normal waste. However, it is important to know that certain recycling centres do have the capability to recycle these non-rechargeable batteries. To determine if you are able to recycle non-rechargeable zinc-air batteries at your local recycling centre.

Caution: Never store used batteries in locations that are potential fire danger areas. Zinc-air batteries are combustible.

EURO-CIU Annual Meeting and Symposium (Hear the Future) 2011

This took place in the beautiful town of Innsbruck in the heart of the Austrian Alps on 29th April 2011. Innsbruck is the home of MED-EL which generously sponsored the symposium and the EURO-CIU General Assembly. The General Assembly hosted by Cochlea Implantat Austria (CIA) was very impressive with fourteen member countries taking place. The proceedings were in English and German with transcription in both languages. A detailed protocol for the organisation of future meetings was agreed so that a good impression would be made if the press attended a meeting in future. There was also a wide ranging discussion about the possibility of European wide associations concerned with deafness like EURO-CIU linking up to form a new organisation in order to have a louder voice in matters affecting the deaf and hard of hearing in Brussels.

Hear the Future

Scientific lecture series of the Austrian Association for Implantable Hearing Systems, a summary by Alison Heath

Prof. Dr. George Sprinzl (Innsbruck University) spoke about 'Modern minimally invasive cochlear implantation'. He said he had done 180 implants in the last four years and his patients had an age range from 11 months to 78 years of age. Most of the implants were on children so minimally invasive surgery as well as safe and reliable surgery was very important as they had a long life expectancy and, at some stage, would need to change their implants though reliability was not a major factor as only 1% malfunction. There had been big technological improvements: the Sonato implant systems were 25% thinner and 250% impact resistant. Surgical times had been reduced from three hours to one and needed only a very small incision. The tiny electrode needed no 'tie down' which together with the small incision made for a rapid recovery. A diamond burr was used to drill a small hole and there had been a return to the round window techniques as opposed to cochleostomy, especially where hearing was to be preserved, as better electrodes meant there was no risk to the facial nerve. The electrodes had to be right for the patient; they could be medium, compressed or split and there were also standard and flexible electrode arrays to choose from.

Pro. Dr. Baumgartner's presentation was entitled 'Hearing preservation'. He spoke about the use of electroacoustical stimulation (EAS) in patients with good preservation of hearing in the low frequencies but very poor hearing in the middle and high frequencies. The first EAS was done in 1999. The combination of a cochlear implant and a hearing aid with acoustically useable



hearing in the low frequencies allows patients with 45% speech understanding to increase it to 70%. Minimal invasive surgery is used as well as round window insertion. In 94% of the patients hearing was preserved but in 6% it was lost within two years. If EAS is used with a bilateral cochlear implant the period of adjustment is longer. The electrode arrays used when hearing is to be preserved are 18-23mm. The cochlea is 35mm and when there is complete insertion with 0.2mm slim electrodes the insertion is 31-32mm.

Dr Bernhard Laback of the Acoustics Research Institute, Vienna spoke on the subject of three dimensional hearing in cochlear implants; horizontal (left/right); vertical (up/down) and dimension in space. Horizontal spatial hearing is not good even with bilateral implants as they do not pick up temporal information which is necessary for this. There were also presentations on stem cell research in relation to the inner ear, genetics of hearing impairment, auditory training for adults and various educational issues concerning children in mainstream education including testing the achievements of hearing impaired children while at school. Two cochlear implant users gave an account of their experiences with bilateral implants and cochlear implantation after 40 years of complete deafness.

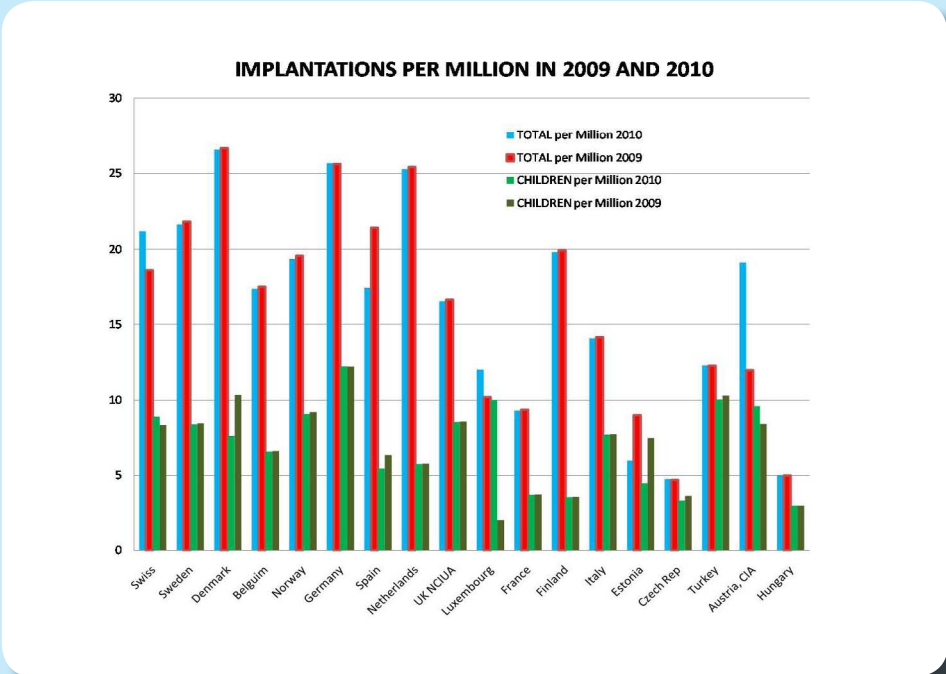
Following the Symposium we were treated to a guided tour of the Hofburg with all its great pictures of the imperial family. After this there was a splendid gala dinner in the Gothic Cellar of the Hofburg.

[The electrodes referred to above are MED-EL electrodes. Most other electrodes require a cochleostomy which is more invasive than the round window techniques referred to above. Ed.]

EURO-CIU Enquiry 2010

Every year the EURO-CIU collects figures from all their member countries in Europe about the number of cochlear implants. It is estimated that over 83000 people in Europe have cochlear implants. To see how the figures returned from member countries of EURO-CIU compare Ruud van Hardeveld, who laboriously collects all the information and analyses it, calculated the number of implants down per million of the population of each country and the results appear in this graph.

It will be seen that the UK is very average in its cochlear implantation performance compared with Germany, Sweden, Norway, Austria, Switzerland, Denmark, Belgium and Holland. Even Spain exceeds the number of implants done in the UK while France lags behind. In poorer countries like Turkey, Estonia, the Czech Republic and Hungary most of the funds available for implantation is spent on children.



Phonak FM Systems

Still Struggling to Hear in Background Noise?

At Phonak we understand that whilst hearing aids allow people to hear better, there are still some everyday environments that can present challenges:

- Listening to Television
- Using the Telephone
- Travelling in the Car
- Noisy Environments

Phonak FM systems have been designed with these situations in mind and could greatly improve your hearing experience. For more information, please visit www.phonak.co.uk.



Would you like a demonstration of Phonak FM systems?

If so, the Ear Foundation now offers a dedicated service providing the opportunity to try, purchase and set up FM systems on site at their Nottingham centre. For further information please contact Claire on 0115 942 1985 or via email at claire@earfoundation.org.uk



Profoundly deaf veterinary student wins Cochlear™ Graeme Clark Scholarship Award

Profoundly deaf student Bethan Hindson has won this year's Cochlear™ UK Graeme Clark Scholarship Award. Bethan has an extraordinary story to tell and one that can inspire many others with goals in education.

Now 25 years old, Bethan was born profoundly deaf and was told that she could never fulfil her dream of becoming a vet. So, with her hopes dashed, she embarked on a history degree after finishing college. And, through sheer determination and a lot of hard work, Bethan is in her third year of veterinary medicine at the Royal Veterinary College, London.

This Graeme Clark scholarship award is an annual award, worth £6,000 and is open to Nucleus® cochlear implant recipients. Its aim is to help hearing impaired implant recipients achieve more in continuing further education.

Bethan says that she is the first profoundly deaf student ever admitted to her veterinary college and that she has to work above and beyond her peers on a daily basis to keep up and overcome any problems that arise because of her hearing impairment. She has come first in her year for two consecutive years which is an incredible achievement and alongside her studies, she also works part time in a veterinary laboratory to help fund her course.



Bethan had a cochlear implant fitted when she was 11 years old. She says that it has made a huge difference to her life and that she no longer has to rely on lip reading. Bethan is cared for by the Nottingham Cochlear Implant Centre.

Talking about the Award, Bethan says, "This opportunity is a dream come true. My whole life has been about striving to keep up and show what I can do. My implant was the first big step in helping me and this award is the next step in fulfilling my dreams of becoming a vet. Words can't express my gratitude to Cochlear UK for this award and to all those who have helped me with my deafness throughout my life."

The Ear Foundation hearing and communicating in a technological era



Implantable Devices 2011:

The State of the Art

25 November 2011 at Nottingham

This popular conference provides a unique forum where current research and practice in all areas of implantable devices will be explored by international experts in the following areas:

- Surgical Update – Early Years and Complex Children
- Audiological Overview
- Bilateral Programming
- Electro Acoustic Stimulation
- Bone Anchored Hearing Systems
- Literacy & the Impact of Cochlear Implantation
- Music with CI Users
- User Perspective and Adult Rehabilitation
- Long Term Management
- Stem Cell Research

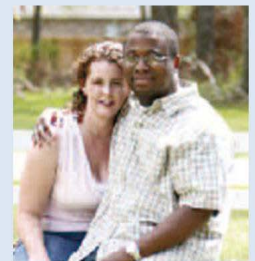
For the draft programme, and to register please visit our website:

www.earfoundation.org.uk

Tel +44 (0) 115 942 1985

Need advice about hearing loss? We can help

James says.....! As soon as I contacted Hearing Link's Helpdesk I felt I was talking to people who really understood my problems. Doors suddenly opened: a Community Volunteer came to visit me and my family at home, and we spent 5 days with other families on a Rehabilitation Programme, which was brilliant!



I have now called on the Helpdesk at every turn – lipreading classes, equipment, benefits, and I am now subscribing to their excellent feature magazine, Hearing Link Matters. For me the Helpdesk has been a lifeline, I know it's always there when I need it.

'The person on the helpdesk was friendly and knowledgeable. I knew I'd come to the right place.'

Hearing Link works to support people with all degrees of hearing loss, including those with an acquired profound hearing loss and implant users.

Whatever your query we will provide a friendly and personalised response. **Contact our Helpdesk today!**
Hearing Link, 27-28 The Waterfront, Eastbourne BN23 5UZ
 Telephone (voice) 0300 111 1113
 SMS 07526123255
 Fax 01323 471260
enquiries@hearinglink.org
www.hearinglink.org

Hearing Link

NEWS FROM THE COCHLEAR IMPLANT MANUFACTURERS

The World's First Waterproof Sound Processor from Advanced Bionics is Making Waves!

In May, Advanced Bionics (AB) made a big splash at the European Symposium on Paediatric Cochlear Implantation (ESPCI) in Athens, by launching Neptune, the world's first waterproof sound processor.

Neptune offers a completely waterproof design that, for the first time ever, allows cochlear implant recipients to hear while swimming and bathing. Cochlear implant professionals and recipients expressed enthusiasm at the prospect of hearing all day long, with no reason to remove the equipment for time spent in the pool, shower, or bathtub.

The processor features a fully submersible microphone, protected by a special hydrophobic membrane that permits sound to pass unattenuated, whilst blocking water. It also has the novel design concept of completely removable controls, allowing the smallest possible waterproof wearing option with nothing worn on the ear. The stylish processor features the first-ever freestyle design, which means it's worn like an MP3 player, clipped to a collar, popped in a pocket or worn with one of the many accessories that accompany the release.

The Neptune processor is powered by one disposable or



Advanced Bionics®

rechargeable AAA battery, giving more than a full day's worth of battery life on just one charge and offering users a low-cost alternative to expensive hearing-aid batteries.

"We are proud to continue our long-standing tradition of leading the industry with breakthroughs in cochlear implant technology. Neptune is a giant leap forward, delivering the best possible hearing in and out of the water," said Dr. Gerhard Roehlein, CEO and CTO of Advanced Bionics.

Indeed, waterproofing has not come at the expense of performance. The Neptune processor features the latest sound processing technology from Advanced Bionics. AutoSound™ adjusts the levels automatically, meaning recipients have the opportunity to hear well without needing to adjust controls on their processor. HiRes Fidelity 120™ is designed to stimulate 120 points across the auditory nerve for offering greater appreciation of music. And ClearVoice™ released only last year*, is designed to allow recipients to hear speech clearly and easily in the noisy situations that were previously difficult for them.

Neptune is currently pending regulatory approval. If you would like to learn more about Neptune or about Advanced Bionics activities within your area, please contact your local Advanced Bionics team on 01 223-847888 or via e-mail on uk@advancedbionics.com.

*ClearVoice is CE approved & released in CE regulated markets.

Cochlear™ introduces the world's thinnest full length electrode array

The ability to preserve the cochlea fine structures and residual hearing following cochlear implantation has become a key desire for both surgeon and patient. The new thin and flexible Cochlear™ Nucleus® CI422 array has been designed to enable optimal surgical outcomes.

The CI422 is the world's thinnest full length electrode array and is designed for patients with moderate to profound hearing loss in the low frequencies and severe to profound hearing loss in the high frequencies. The CI422 provides excellent electrical stimulation outcomes with proven preservation of residual hearing. Cochlear's unique Soffip™, combined with the arrays apical flexibility and smooth lateral wall surface eases insertion through the delicate cochlea structures and minimises the potential for trauma.

Whilst the CI422 is designed primarily for normal cochlea, it is also been used in a wide range of abnormal cochlea anatomies such as common cavities and

partial ossification. In December 2010, two year old Megan McCourt became the first person in the country to receive our newest electrode. Mr Anirvan Banerjee, Ear Nose and Throat Consultant at the James Cook University Hospital said: "Megan was due to have a bilateral operation last June - but we spotted the cochlea was abnormal, which meant the conventional device due to be implanted inside her ear during surgery, was not the best fit. I spoke to colleagues around the country about Megan's case and it was at one of those meetings I learned of the new Cochlear™ Nucleus® CI422 cochlear implant and said 'I want it'. It is very new - not only in this country but worldwide - and I was on holiday when I heard it was available so I came back to do it." Stuart Thomas, Cochlear Implant Team Manager, UK, Ireland and South Africa said: "Our electrode portfolio is dedicated to a range of patient needs and surgical techniques and since the introduction of the CI422 we have seen it used in a variety of cases across many of our clinics."

If you would more information on any of our products or services please email info-uk@cochlear.com or visit www.cochlear.co.uk

MED-EL's New CONCERTO Cochlear Implant

MED-EL is proud to introduce the new CONCERTO Cochlear Implant, the world's smallest and lightest titanium implant.

- 25% thinner than the SONATATI100 titanium implant
- Reduced weight, now 7.6 g.
- Designed for minimally invasive surgical techniques

- Optimal choice for surgeries performed on small children.
- Largest variety of electrode arrays for every cochlear anatomy

The particularly small dimensions make it the ideal choice for children and adults of all ages. CONCERTO is offered with a variety of the softest and most flexible electrode arrays ever produced for preservation of the delicate neural structures of the cochlea.

National Institute for Health and Clinical Excellence (NICE) guidelines

The NICE guidelines on bilateral cochlear implantation were issued in January 2009 to be reviewed in February 2011. The original guidance recommended that further research be conducted to assess the benefits of bilateral cochlear implantation (compared with unilateral implantation) in adults with severe to profound deafness, and to collect health-related quality of life data in children with bilateral cochlear implants. No new evidence has been published in these areas which address the research recommended.

The review has now taken place and a decision has been made to move the guidelines to the static list. This happens when it is clear that there is no new research available that would have any material effect on the current guidance. Topics on the static list may be transferred back to the active list for further appraisal if new evidence becomes available that is likely to have a material effect on the last guidance issued.

EMERGENCIES NEW 999 SERVICE

Most people and most CI users can dial 999 in the normal way but there are some CI users and deaf people who are either not comfortable using the telephone or cannot use it.



After running a trial scheme with the mobile phone companies whereby SMS text phone messages could be sent to the 999 service Ofcom have announced the scheme is to become permanent. Registration is simple – just dial 999 on your mobile phone and text “register” and then say “yes” to the reply. Details of the service and registration can be found at www.emergencysms.org.uk

Breakdown services – emergency SMS call out numbers

The largest roadside rescue services offer SMS call our numbers for hearing impaired customers.

They are:

AA 07900 444 999;

RAC 07855 82 82 82;

Greenflag 07712 164 700.



Message from the Editor

This is not exactly the first NCIUA Newsletter I have edited. I used to combine the roles of Secretary and Newsletter Editor. When Richard Byrnes took over from me the Newsletter grew in size and its appearance greatly improved. His will be a hard act to follow.

I would very much like future Newsletters to have more contributions from members. Stories of your experiences with your cochlear implant would be especially welcome. They help to inspire and reassure intending implant users and existing users. We would also like to have letters and information that may be of interest to other members. Please help.

The next Newsletter will be the Winter Newsletter which will be due out early in the New Year. Please send any contributions to me. Email address: editor@nciua.org.uk

From the Treasurer

Membership renewals

Heartfelt thanks to the many members who have renewed their subscriptions promptly, this makes my life a lot easier and reduces our administration costs.

A particular thank you is due to those members who were able to include a supporting donation with their subscription cheque. The cost of running the Association significantly exceeds our subscription rates, and we are very grateful for any further support from members.

Paul N Tomlinson, Honorary Treasurer

National Cochlear Implant Users Association

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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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