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Welcome

Welcome to Southern Sounds, a newsletter by Southern ENT. The newsletter has been created to ensure a regular flow of information relevant to your focus area. With a range of interesting topics I hope you find it both useful and interesting. We have strived to find a balance of technical, clinical and commercial information that may benefit your management of cochlear implant and Baha recipients. May I take this opportunity to encourage you to let us know which topics you would like us to feature, ask questions and offer comment.



Clinical Focus

Cochlear Implants

Why the Contour Advance Electrode

With different electrode offerings from different companies, why do Cochlear believe so much in the modiolar positioned Contour Advance electrode?



Contour Advance Electrode continues...

Typically-speaking in a normal unobstructed cochlea we wish to stimulate as much of the spiral ganglion population with the highest precision possible. It is often a preconception that a cochlear implant electrode needs to go into the cochlea 2.5 turns. But what text books do not discuss, because they are often more concerned with acoustic amplification, is the exact position of the neural elements that a cochlear implant stimulates?

A cochlear implant does not stimulate the hair cells in the cochlea, as these are mostly absent, but rather the spiral ganglion, which are located very close to the inner wall of the cochlea, traversing just a little over 1.5 cochlea turns of depth. This means that there is little point creating an electrode that goes incredibly deep into the cochlea, especially given that the deeper the electrode goes the more insertion force is required. Therefore the Contour is designed to go into the Cochlear about 1.5 cochlea turns, corresponding to these spiral ganglion elements.

But more than this, the electrode is designed to curl gently towards the inner wall of the cochlea so that it is as close to the neural elements as physically possible. By doing this, not only can the stimulation be more efficient, but more importantly the electrodes stimulate a more specific group of nerve cells than they would if positioned against the lateral (outer) wall. This provides better frequency resolution to the brain and potentially improved sound perception.



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Editor's note

With this follow up Professional Communication of Southern Sounds we hope to render a focussed and informative service to professionals in the cochlear and Baha industry.

We continue to rely on your feedback and invite everyone to please share information and give us feedback to ensure we all stay in touch with this "fast moving" industry.

The next Southern Sounds Professional Communication can be expected by July 2011. Please submit your feedback, contributions and articles by 15 June. I look forward to hearing from you!

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Clinical Focus

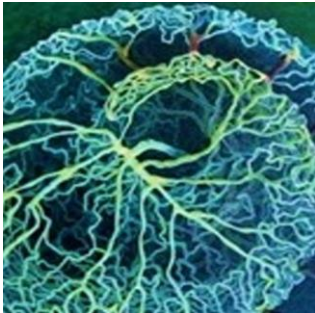
Cochlear Implants

IDR vs IIDR

It is important to appreciate the difference between input dynamic range (IDR) and instantaneous input dynamic range (IIDR) to understand how different cochlear implant systems code speech. The Nucleus CI system has a default IIDR of 40dB. This comprises the T-SPL (the level of sound that stimulation at threshold level is mapped to), typically 25dB, while the C-SPL (the level of sound that stimulation at comfort level is mapped to) is set at 65dB by default. Electrical stimulation can produce loudness sensations that cover the full range from barely audible to uncomfortably loud. However within this range, implant recipients cannot distinguish as many discrete loudness levels as normal hearing listeners as they have reduced loudness resolution within the perceptual dynamic range. A device could map the lowest normally audible sound (about 0 dB SPL) to electrical threshold, and the loudest tolerable sound (about 120 dB) to the electrical limit for comfort. That would result in an IIDR of 120 dB. It sounds good, but would have negative consequences, because the smaller rapid fluctuations in intensity that occur within normal speech (for example, between 40 and 60 dB in a single utterance) are then indistinguishable because so much of the perceptual dynamic range is allocated to extremes of the acoustic environment.

IDR vs IIDR continues...

The Nucleus® implant system addresses this problem by using a moving “window” of about 40 dB which is adapted to the acoustic environment. At any given instant, the electrical threshold is mapped to one acoustic intensity, and the upper comfortable limit is mapped to an intensity that is 40 dB higher. When the environment is noisy, the window moves up, and when it’s quiet the window moves down. This is controlled by two different control loops (automatic gain controls) with differing time constants. This allows the listener to exploit optimally the available resolution in perceived loudness steps. Thus the IIDR is 40 dB, but the overall perceptual dynamic range (IDR) is much greater, on average 80 dB. Based on the auditory environment and program settings, the IDR can range from around 15 dB to over 90 dB.



eSRT and eABR

Electrical Stapedial Reflex Threshold (eSRT) measurements and Electrical Auditory Brainstem Response (eABR) are very helpful measurements in establishing or confirming a recipient’s C-level and can be used with adults or children. There are excellent books published on the subject which are recommended reading: **Cochlear Implants: Objective Measures, Edition 1** by Helen Cullington. **Programming Cochlear Implants**, Jace Wolfe, PhD, Erin Schafer, PhD

eSRT

Sedation is not necessary to obtain this measurement. However the recipient needs to be able to keep reasonably still and have normal middle ear status. Your tympanometer must have a setting for reflex decay. (Screening tympanometers generally do not have this functionality). You can measure

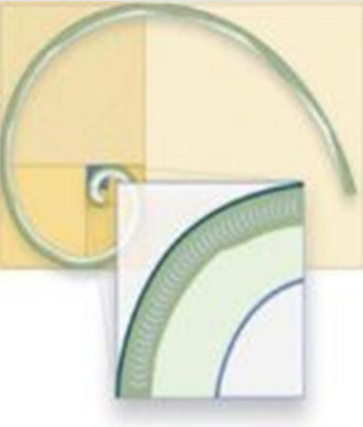
CLINICAL FOCUS

COCHLEAR IMPLANTS

defined electrodes across the array (or globally in live mode). It is helpful to present two stimulations so that a clear repeated compliance change (‘W’ shape) is observed. Increase the C-levels until this pattern is clearly seen (as long as the recipient is comfortable) and then threshold seek to determine the lowest level the reflex is observed. The recipient’s C-level should then be set below the eSRT. The available electrical dynamic range is then optimized for this recipient.

eABR

Most evoked potential machines can be successfully used to measure electrically generated responses from cochlear implant recipients. You will need to source a trigger cable from the manufacturer of your evoked potential machine. Failing that, your medical physics department may be able to make one.



This cable connects the Pod’s trigger output to the external trigger input of your evoked potential machine. Sedation is necessary for young children and full diagnostic testing should take around an hour. Screening eABRs can be completed more quickly, e.g. in cases where confirmation that electrical stimulation is progressing along the hearing pathway is required, rather than data to assist in setting the map levels.

Cochlear Academy holds courses twice yearly on the theory and practice of eABR and we encourage any clinicians who are keen to start eABR testing to attend. Contact your clinical specialist at Southern ENT for more information and assistance.

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Clinical Focus Baha

New era for bone conduction

The introduction of the Cochlear™ Baha® 3 System heralds a new era for bone conduction. Traditional concepts have been radically changed based on new research and technology and the result is - BC Direct. BC Direct is a direct way to measure the exact hearing threshold via the Baha processor and implant. With a 12 channel frequency band system, the Cochlear Baha BP100 delivers optimal gain for each frequency.

What does that mean for you?

Fitting Variability

Recent bone conduction research has given us more insight in the actual

transmission of sound to the cochlea. From this research we can conclude that there are five factors that have an important impact on the optimal fitting of the Baha system:

1. attenuation of the skin
2. position of the implant
3. quality of the bone
4. cross hearing effects
5. transcranial attenuation

BC Direct

With BC Direct it is now possible to take out the uncertainty in the Baha fitting. By measuring the bone conduction threshold using pure tone audiometry via the Baha 3 System, it is now possible to identify the realistic situation.



Baha user DVD

WHAT’S NEW

BAHA

Baha user DVD

Helping our recipients get the most from their Baha – an instructional DVD for Baha recipients. This easy to use and informative DVD explains topics such as how to look after the Baha processor and abutment, using audio and phone accessories and Baha Softband. If you would like copies of the DVD please contact Southern ENT.

The Cochlear Baha BP100 together with the Cochlear Baha Prescription rule can compensate the hearing loss per frequency.

Improved Accuracy

What you see is what you get; BC Direct provides an accurate representation of the bone conduction transmission taking all influencing factors into account. That will give you 100% confidence in your fitting procedure and the Baha user with an optimal hearing performance! Remember that the Baha 3 System provides more than 25% improvement in hearing in noise compared with previous generation devices.

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What’s new with Baha

New Cochlear™ Baha® 3 System

Facts

50% shorter time to fitting
90% greater implant stability
25% improved speech understanding in noise
More than 5000 processors fitted worldwide

Components

BP100 sound processor
BI300 Series implant
BA300 Series abutment

Professional Tools

Fitting Software
Surgical Tools

The Cochlear Baha Prescription is the first hearing loss compensation strategy dedicated to direct bone conduction and is found only in the BP100 sound processor. The brilliantly designed processor is built for durability while automatically managing directionality and noise. Three modern fitting options provide a choice of advanced, yet simplified tools for the sound processor fitting. The unique BC Direct feature within the Fitting Software lets you measure your clients’ bone conduction thresholds directly through the BP100.

Read more:
[brochure for professionals](#)

What’s new with cochlear implants

Dual microphone technology

The implementation of dual microphone technology in the Cochlear Nucleus CP810 Sound Processor incorporates two omnidirectional microphones. They are precisely calibrated to +/- 1 dB tolerance to ensure accuracy and consistency. In addition, the two microphones are phase matched. These low noise microphones are combined into selected directional responses using digital signal processing. Dual microphone technology allows us to provide an enhanced suite of directionality for improved listening in noise and better recipient performance available only in the Nucleus 5 System.

Custom Sound 3.2 Managing recipients

- Clinician can lock volume, sensitivity and telecoil functions on CR110 Remote Assistant
- Change in Freedom and CP810 paediatric defaults for accessory and telecoil mixing
- Ability to configure a recipient’s CR110 device to use a basic or simplified version of the user interface
- Access to discrete mode (turn off LEDs on CP810 processor)
- Ability for a clinician to enter notes against each electrode for a recipient’s implant
- Improved implant selection and search capability when creating a new recipient
- Ability to set volume and sensitivity in the Talkover screen
- Page numbers, DOB and recipient name added to all pages of reports.

Hearing performance?

- Supports conversion and upgrade for Nucleus 24 recipients to the CP810 processor and CR110 Remote Assistant

WHAT’S NEW COCHLEAR IMPLANTS

- Zoom added to SmartSound Noise program (CP810 only)
- SmartSound Everyday program default changed to ASC + ADRO (CP810 only)
- Changed paediatric telecoil and accessory mixing ratio to 1:1 (for Freedom and CP810).

Managing MAPs

- Nucleus 24 processors to CP810 conversions
- Ability to perform MAP conversions (e.g CP810 > Freedom)
- Improved battery suitability interface (including ability for the software to provide recommendations regarding the suitability of different battery types for use with an FM accessory)

Software usability and installation

- Database tool improvements
- Updated eHelp
- Updated Clinical Guidance Document

Complete Cochlear Implant Portfolio

Electrodes designed with you and your patient in mind

Cochlear’s market-leading range of electrodes is the result of 30 years of groundbreaking, collaborative clinical and technical research work. Our extensive experience in electrode design – and some of the world’s leading surgical and clinical studies - confirms that minimally invasive electrode insertions are key when it comes to optimising surgical outcomes and lifetime hearing benefits.

One size does not fit all

Specific indications demand specific solutions to achieve the best possible outcome. Our history of providing the most exacting solutions means you can be assured of selecting an electrode designed to be the best fit for your patient. Cochlear’s electrode portfolio is dedicated to a range of hearing modes and surgical techniques. Exhibiting a powerful combination of attributes, our tailored, highperformance electrodes are designed to realise the full potential of each individual. Cochlear electrodes are provided on the most reliable receiver/stimulator technology. Delivering MRI capability at 3 Tesla and industry-leading AutoNR T®, electrodes from Cochlear continue to redefine the standards in the industry.

Cochlear™ Nucleus® CI512: Contour Advance™ Electrode



The Nucleus CI512 cochlear implant with Contour Advance™ electrode is the industry’s leading perimodiolar electrode. The CI512 is the gold standard for patients with moderate to profound hearing loss in the low frequencies; and severe to profound hearing loss in the high frequencies.

Cochlear™ Nucleus® CI422: Straight Electrode



The straight half-banded electrode as seen on the Cochlear™ Nucleus® CI422 cochlear implant is our newest, full length lateral wall electrode. For patients with moderate to profound hearing loss in the low frequencies and severe to profound hearing loss in the high frequencies, the CI422 is designed for excellent outcomes in electric-only stimulation and delivers excellent capability to preserve residual hearing.

Cochlear™ Hybrid™ L24 Electrode



Designed for patients with mild to moderate hearing loss in the low frequencies and severe to profound hearing loss in the high frequencies. The Cochlear™ Nucleus® Hybrid™ L24 is the industry’s most proven hearing preservation electrode, delivering excellent outcomes in electro-acoustic stimulation.

Cochlear™ Nucleus®: CI551 Double Array



Now on the latest CI500 series receiver/stimulator, the Cochlear Nucleus CI551 Double Array cochlear implant is ideal for those patients where intracochlear electrode insertion is still possible but a full insertion is not expected, such as in an ossified cochlea.

Cochlear™ Nucleus® ABI541: Auditory Brainstem Electrode



Now on the latest CI500 series receiver/stimulator, the Cochlear Nucleus ABI541 Auditory Brainstem Implant is a viable and clinically proven treatment for patients who cannot benefit from a cochlear implant due to conditions including bilateral acoustic neuroma, cochlear nerve avulsion or complete cochlear ossification.

What’s new with rehabilitation

Hope Notes Music Rehabilitation Programme



The newly launched Hope Notes package is a unique programme developed for cochlear implant, Baha and hearing aid users to enjoy music on a whole new level. The Hope Notes package contains a DVD that includes expanded versions of some songs, visual tips and advice, simple animations and original song videos and a CD with just the songs so it can still be used on the go. Turn the music on! This package can now be ordered from Southern ENT and is available to both professionals and recipients.

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DID YOU KNOW?

Did you know?

- Until now, it has been common practice to place the Nucleus bilateral identification labels at the tip of the sound processor housing. Due to the fact that the new Snugfit™ has a frosted appearance, the bilateral identification label won’t be visible anymore. Therefore it is suggested that the label is placed near to the LED window.
- The new CP810 Sound Processor is now available for all N24 recipients
- Patients can now return their current sound processor, which does not even need to be in working order, and receive a discount on the new CP810 sound processor
- Cochlear loaner products are issued to all clinics whilst a device is being repaired

AND DID YOU KNOW... COCHLEAR

- ✓ has over 200 000 recipients worldwide
- ✓ partners with 3000 clinics in more than 100 countries
- ✓ is currently undertaking 73 research projects over 19 different countries
- ✓ has been awarded one of the world’s most prestigious design awards, the ‘red dot award: product design 2010’ for its breakthrough with the Nucleus 5 System



Stockholm

Inspiration Stockholm Cochlear Satellite Symposium

During the recent International Conference on Cochlear Implants & Other Auditory Implantable Technologies in Stockholm, Cochlear held a satellite symposium entitled: Cochlear – breaking performance barriers. We now offer you this great opportunity to view these live presentations on your PC! Click here: [Cochlear Satellite Symposium](#)

Download Recommended reading

Herewith some links to a selection of interesting white papers and articles. Clinicians are invited to submit articles to be published in this newsletter in future to share valuable knowledge and information with fellow clinicians.

Just click on the document you would like to open. Happy reading:

- CI: [White Paper N5 speech in noise](#)
- CI: [Profound Deafness in Childhood](#)
- CI: [Ppseudobinaural vs Real Hearing](#)
- Baha: [White Paper B1300](#)
- Baha: [White Paper BC Direct](#)
- Baha: [White Paper BP100](#)
- [Audiological Concept](#)
- Baha: [White Paper Implant Stability](#)
- Baha: [White Paper BP100 Results Evaluation](#)
- Baha: [White Paper B1300 Tight Seal](#)
- Baha: [White Paper BP100 Clinical Study](#)
- Baha: [White Paper Implant Geometry](#)
- Baha: [White Paper BP100 design](#)