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SoundWaves

Newsletter for Professionals

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Expectation and Quality of Life Evaluation Tools for Clinicians

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As an important part of our professional role, we need to be confident that patients are entering the cochlear implant process with realistic expectations, which must be thoroughly discussed and documented. It has been our experience that patients' expectations may continue to be unrealistic even following counseling or change following implantation. Because of this dilemma, we have developed a system to document and track counseling, expectations, and benefits for adult cochlear implant users through the use of expectation and quality-of-life questionnaires. We have begun implementation of these tools with all adult patients before implantation as well as at three, six, and 12 months after implantation. Patients report that the questionnaires are easy and take only a few minutes to complete. Having patients complete these questionnaires at the beginning of the appointment has given us tremendous insight. We now have a better understanding of our counseling efficacy, true patient expectations (pre- and post-implantation), and how patients view their past and present quality of life.

Our initial process begins with three short questionnaires—one open set and two closed sets. These questionnaires, which have been designed for quick and easy completion, are given to the patient in the waiting room prior to their final counseling appointment and device selection. Spreadsheets allow for simple analyses of the data. Pre-implantation questionnaires include an open-ended Expectations Questionnaire, a closed-set Expectations Scale, and a closed-set Quality of Life Questionnaire. Most patients can complete all three forms within 10–15 minutes.

The pre-implantation Expectations Questionnaire requires patients to describe, in their own words, what they expect their cochlear implant to provide for them. Further counseling is recommended if inappropriate expectations are revealed by a patient's response. The questionnaire, along with patient and provider signatures and comments, are then officially documented and entered into the patient chart. The tool can also allow the cochlear implant team to track the efficacy of their counseling with implant candidates.

The pre-implantation Expectations Scale is divided into 10 daily living categories that include sound awareness, lip-reading, communication, telephone use, television, background noise/group listening situations, music, work/education, social, and quality of life.

SECTIONS

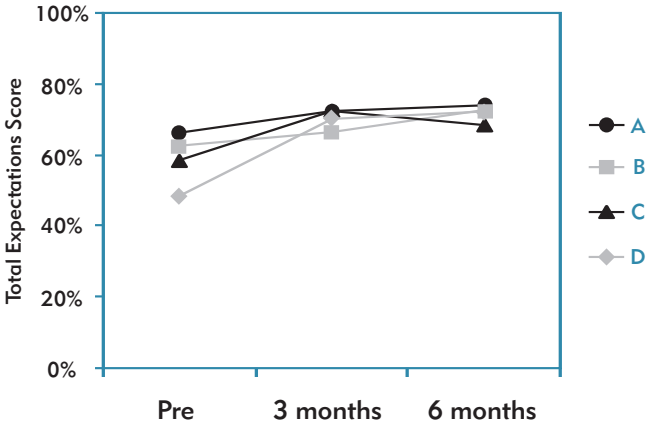

Figure 1. Expectations Scale results for four patients before and after implantation.

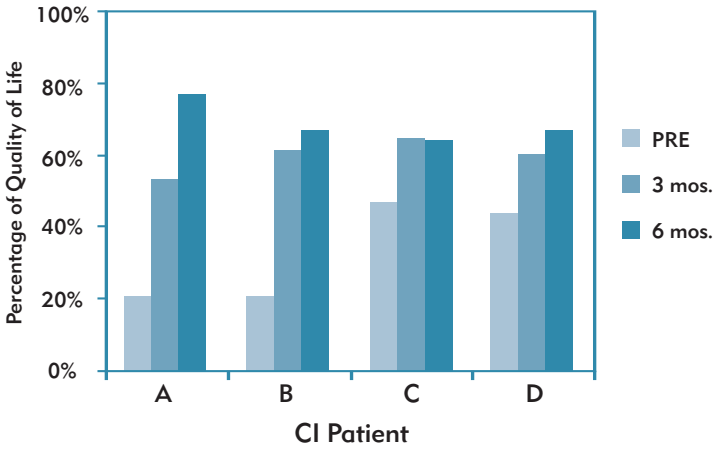

Figure 2. Quality-of-Life Questionnaire results for four patients before and after implantation.

Patients rank on a scale of 1 to 5 the description that best demonstrates the maximum result they expect to achieve following cochlear implantation. These responses can be reviewed individually as well converted to an overall percentage score. Other Expectation Scales are administered at three, six, and 12 months after implantation. When patients respond following implantation, they indicate the benefits that they are currently obtaining with their cochlear implant. Our hope is that patients are meeting and/or exceeding their pre-implantation Expectations Scale score. Figure 1 shows four samples of Expectations Scales results before and after implantation. These scores demonstrate that patients entered the cochlear implant process with realistic expectations that were met or, in some cases, surpassed.

In addition to expectations, we also were interested in improvements in patients' quality of life. As clinicians, we often are asked about the success of our patients. And, as all clinicians know, success is relative because patients enter the implant process with varying listening experiences and goals. Some patients want only to have sound awareness, while others want to use the telephone successfully. The dilemma clinicians are faced with is how to document success. The Quality of Life questionnaire was designed to address this dilemma. It is another closed-set questionnaire consisting of 15 questions that is completed in the waiting room with the other questionnaires. Patients rank their participation and/or involvement in various communication situations on a scale from *never* to *always*. Items include conversations in noisy environments, telephone use, listening at a distance, use of radio and television, participation in activities, confidence in social situations, independence, quality of speech, and overall quality of life. Space for comments is also available. This information is tracked before and after implantation to measure the effect of the device on each patient's quality of life.

Figure 2 shows quality of life rankings for the same four patients as in Figure 1. The improvements in these patients' quality of life range from 17% to 56% after six months of implant use.

We have found that using these expectations and quality of life tools has been extremely valuable to our team and to cochlear implant recipients for several reasons. They serve as a means to monitor our counseling efficacy, to identify the need for additional counseling, and to document patients' expectations and quality of life scores. Results can serve as red flags for those patients who need additional counseling prior to surgery. For those patients whose goals change once they have reached their original expectations, documentation is available to support clinicians during counseling. Responses on post-implantation questionnaires serve as a troubleshooting tool as well as a guide for implant program modifications and/or the need for auxiliary devices. We also see the potential use of documenting patient benefit for obtaining financial support. The efficacy of these tools is now being evaluated in a multi-center study. If your center would be interested in implementing these tools and participating in our study, please contact our facility at (443) 849-8400 or at cicenter@gbmc.org.

Fitting Tips

AUDITORY NEUROPATHY AND COCHLEAR IMPLANTS

Auditory neuropathy (AN) is a term used to describe a unique and recently recognized type of hearing disorder (Sininger et al. 1995, Starr et al. 1996). Symptoms of AN include 1) hearing loss of any degree, usually bilateral, 2) normal outer-hair-cell function evidenced by the presence of otoacoustic emissions (OAEs) and/or the cochlear microphonic (CM), 3) abnormal evoked potentials beginning with Wave I of the auditory brainstem response (ABR), and 4) poor speech perception. The origin or site of lesion for patients with AN remains unclear, but may include the inner hair cells (IHC), the synapses between IHCs and the auditory nerve, or the auditory nerve itself.

The uncertain etiology and diverse audiologic and neurologic findings in patients with AN provide a rehabilitation challenge for clinicians. One pervasive observation is poor temporal encoding and degraded speech perception ranging from limited to no open-set discrimination (Starr et al. 1996, Zeng et al. 1999). Conventional hearing aids, FM systems, and tactile aids offer limited help to AN patients (Rance et al. 1999).

Approximately 30% of patients with AN have audiometric thresholds in the severe-to-profound range and therefore could be considered candidates for cochlear implantation (Trautwein et al. 2000). Cochlear implantation routinely is performed in children and adults with hearing losses where the cochlea is the primary site of dysfunction. In most of these patients, the status of the auditory nerve is unknown but is presumed to have some residual function.

Initially, implanting AN patients was considered inappropriate because of suspected disease of the auditory nerve. However, studies suggest that the electrical stimulation provided by a cochlear implant might promote neural survival (Araki et al. 1998, Mitchell et al. 1997), restore temporal encoding (Shannon 1993), or produce more synchronous auditory brainstem responses (Zhou et al. 1995a, 1995b). Therefore, many cochlear implant teams cautiously decided to implant some patients with AN. Many of these studies have reported significant success with cochlear implants in patients who did not benefit from conventional amplification (Mason et al. 2003, Peterson et al. 2003, Shallop et al. 2001, Trautwein et al. 2000).

Now that a cochlear implant is considered a viable option for some patients with AN, clinicians are beginning to explore optimal programming parameters. In 2003, Advanced Bionics released HiRes, a new sound-processing strategy that uses narrow pulses and fast rates of stimulation designed to promote a stochastic neural response. Studies showed that HiRes improved patient performance on both subjective and objective measures in typical adult recipients (Koch et al. 2004). The question is whether improved benefit also might be observed in AN patients.

Auditory Neuropathy Case Studies

The following cases report the experiences of several audiologists after children with AN have been implanted with the HiRes system. These cases demonstrate that HiRes can be fit successfully in patients with AN and can lead to significant improvements in speech and language benefit. Nonetheless, even though studies have reported promising results, the diagnosis of AN should not result in an immediate referral for a cochlear implant. Some infants diagnosed with AN, who initially appear deaf behaviorally, show improved or fluctuating auditory responses with increasing age (Berlin et al. 1999). Moreover, a few patients have experienced benefit with conventional amplification (Rance et al. 1999). In sum, if a decision is made to proceed with a cochlear implant in a child with AN, it is important to counsel parents appropriately with guarded expectations and to monitor the child's progress closely.

Case Study 1

Provided by Saneta Thurmon, MA, CCC-SLP/CFY-A
University of Tennessee Child Hearing Services, Knoxville, Tennessee

Child 1, who was born at 36 weeks, was jaundiced and spent three weeks in intensive care after birth, where he was placed on a ventilator for one week and given antibiotics. He passed the otoacoustic emissions (OAEs) screening during his hospital stay. Child 1 received early intervention services including speech therapy starting at two years of age in the home, but made no progress in his speech development after more than 1 1/2 years therapy. In addition, he was diagnosed with a sensory integration disorder and received occupational therapy twice a week beginning at age one year 10 months.

Even though he had passed the hearing screening, Child 1's mother still suspected that something else was wrong besides a speech delay and sensory integration disorder. She had him evaluated by several professionals, including a child psychologist, but no diagnosis explained his inability to communicate. His hearing was tested again at age three years. Distortion product otoacoustic emissions were absent at 1000 Hz and 2000 Hz but present at 4000 Hz in both ears. ABR results indicated a possible neural hearing loss. Because of the presence

of some OAEs and the ABR results, Child 1 was diagnosed with auditory neuropathy or dys-synchrony. After further consultation with Dr. Charles Berlin, a reverse-polarity ABR was performed to confirm auditory neuropathy. Shortly thereafter, additional OAE testing showed robust responses, further confirming the diagnosis.

Child 1 began to use a hearing aid and attended therapy sessions for two hours a week at age three. No auditory improvements were observed when using a hearing aid in either ear. He responded to some environmental sounds, but his responses to auditory stimuli were always inconsistent. His behavior also was difficult to manage. Tantrums occurred often and it was difficult to convince him to wear hearing aids. There was no progress in his receptive or expressive communication abilities despite intense intervention services. He continued to babble predominately with vowels and produced less than five intelligible words.

At three years six months, Child 1 was implanted with a HiRes 90K cochlear implant. After initial stimulation, he consistently attended both individual and group therapy for a total of five hours per week. His mother became a therapist at home and worked with him constantly. Child 1 showed immediate benefit from the implant. His behavior improved, and he appeared to be more in tune with his surroundings and less frustrated. He loved to wear his cochlear implant, unlike the struggle that previously occurred over hearing aid use. He quickly learned new words and phrases. Currently, Child 1 is mainstreamed in a private preschool two days a week. This setting provides speech and language peer models in a curriculum-based setting. He is very happy in preschool and is thriving. He can count to 20, write his name, and say most of the alphabet. He also attends both individual and group therapy at the university clinic for six hours per week. Now five years of age, Child 1's speech and language skills have shown incredible improvement since receiving his cochlear implant and are similar to a two-to-three-year-old child even though he has only had access to sound for $1^{1}/_{2}$ years.

Case Study 2

Provided by Kristin Uhler, MA, CCC-A
University of Colorado Hospital, Denver, Colorado

Child 2 was diagnosed with AN shortly following his first birthday with fluctuations in hearing. At the time of diagnosis,

Research News

Presentation Level and Speech Perception

A recent study by Firszt et al. (2004) examined whether presentation level affects speech perception ability in adult cochlear implant users. They assessed word and sentence recognition in quiet at 50, 60, and 70 dB SPL and sentence recognition in noise at 60 dB SPL (+8 dB S/R) in 78 subjects (26 subjects each used the Advanced Bionics CII device, the Nucleus 24 system, and the Med-El Combi 40+ system). Results showed implant users performed, on average, equally as well at 60 dB SPL as at 70 dB SPL in quiet. In addition, speech perception was quite good at 50 dB SPL in quiet although scores were, on average, 15% to 18% poorer for that stimulus level. Notably, the ability to hear sentences in noise was poorer than listening in quiet at 50 dB SPL.

These results indicate that current clinical practice of testing at 70 dB SPL may not reflect the real listening challenges experienced in everyday life by cochlear implant users. Test results at that level often show ceiling effects. The authors recommend that new candidacy criteria, which are based on evaluating speech recognition at 60 or 50 dB SPL, would reflect more accurately real-life communication than the current candidacy guidelines.

Reference

Firszt JB, Holden LK, Skinner MW, Tobey EA, Peterson A, Gaggl W, Runge-Samuelson CL, Wackym PA. Recognition of speech presented at soft to loud levels by adult cochlear implant recipients of three cochlear implant systems. *Ear and Hearing*. 2004;25(4): 375-387.

the family chose to use simultaneous communication. Child 2 tried hearing aids, which improved his vocal quality but did not improve his speech discrimination skills. Once Child 2's family decided to pursue cochlear implantation, he received a CII at age four years eight months. NRI in the operating room determined that neural responses were present on Ch3 at 161 µA, on Ch7 at 145 µA, and on Ch15 at 233 µA. Child 2 has used his cochlear implant full time since it was activated at age four years nine months. He initially used MPS, was transitioned to SAS, and currently uses HiRes-P. Once Child 2 learned to loudness balance, his speech discrimination abilities improved. More recently, NRI testing shows that responses are not present for Ch3 or Ch5 at UCL (142 µA). However, responses are present on Ch 7 at 120 µA, on Ch10 at 127 µA, on Ch12 at 122 µA, and on Ch14 at 112 µA.

Over time, Child 2's M levels have fluctuated slightly. Initially, his M levels were very low while using SAS and gradually increased as he adjusted to SAS. When he transitioned to HiRes-P, the M levels decreased and have been stable for the past two years. Child 2 scores 60% to 70% on the MLNT-hard list and averages 92% on the MLNT-easy lists. His speech discrimination ability on sentence lists ranges from 50% to 77%. His speech intelligibility continues to improve and he understands well enough to learn incidentally, picking up idioms from his friends and teachers. Child 2 is mainstreamed for all of his classes with an interpreter because he continues to use simultaneous communication.

Case Study 3

Provided by Jolie Fainberg, MA, CCC-A
Children's Healthcare of Atlanta, Atlanta, Georgia

Child 3 had a normal birth history and auditory development until 16 months of age when her parents noticed a decrease in her use of words (she had a vocabulary of 40 words at that time) and failure to respond to sound. She was evaluated by an audiologist and found to have fluid in her middle ears. Tubes were placed and normal hearing results were obtained thereafter. The family pursued speech therapy, but Child 3 made little progress. The speech-language pathologist suggested that the parents obtain a second opinion and a hearing evaluation from a different audiologist. Auditory brainstem testing revealed a profound hearing loss with auditory neuropathy. A two-month

Using Softer Presentation Levels to Assess Binaural Listening Benefits

Advanced Bionics is sponsoring a bilateral study in adults with postlingual onset of severe-to-profound hearing loss. One unique aspect of this study is post-implant testing at 60 dB SPL. The goal of this more difficult testing condition is to allow for finer differentiation between bilateral and unilateral performance. Figure 1 shows the three-month results from a subject who was implanted with bilateral HiRes 90K devices in the same surgery by Dr. Robert Peters (Dallas Otolaryngology, Dallas, Tex). Programming and testing were performed by Jennifer Lake, MS. Figure 1 shows the patient's three-month HiRes results for CNC words and HINT sentences in quiet at 60 dB SPL presentation level. This patient exhibits clear binaural benefit, evidenced by higher scores when the patient is listening with both implants compared to scores with the right or left implant alone.

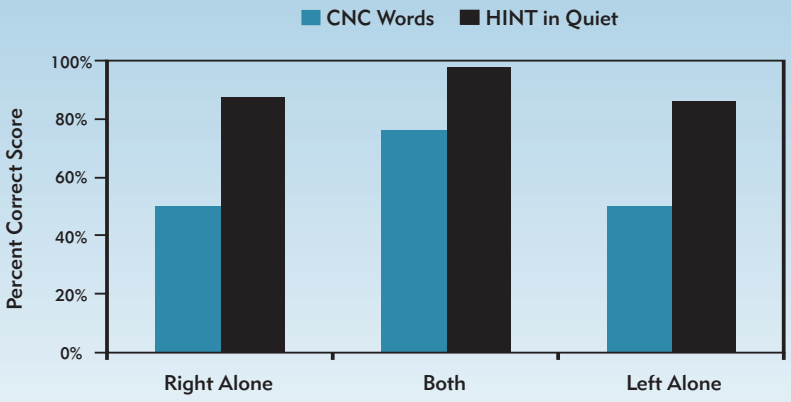

Figure 1. CNC-word and HINT-in-quiet scores (60 dB SPL) for each implant alone and for both implants used together. The subject experiences greater speech-perception benefit when using both implants at the same time.

trial with hearing aids provided no benefit to Child 3. She subsequently was implanted with a HiRes 90K cochlear implant at age two years eight months. Table 1 summarizes her post-implant speech perception scores.

Child 3's auditory verbal therapist reports that in the several months following the one-year evaluation, her language has improved dramatically, and she is now speaking in sentences. Aided implant threshold testing shows responses at 25 to 30 dB HL for warble tones and at 15 dB HL for speech.

Case Study 4

Provided by Tanis Howath, MSC
Glenrose Rehabilitation Hospital,
Edmonton, Alberta

Child 4 was diagnosed with auditory neuropathy at 17 months of age and currently is almost seven years old. She was implanted with a CII device at the age of three years five months. Her first sound-processing strategy was SAS, which she used for eight months after initial stimulation. During this time, she progressed from 0% pre-implant on the PBK words and phonemes to 16% and 44%, respectively. Before implantation, she could not pass subtest I (linguistic versus non-linguistic) on the TAC. At eight months post implant, she passed subtests I, II (linguistic/human non-linguistic/environmental), and IV (single element core vocabulary). Her IT-MAIS score was 2/40 before implantation and 35/40 at eight months post-implantation.

Eight months after initial stimulation, Child 4 she was crossed over to the HiRes-P strategy, after which she con-

	1 Year Post Implant	1.5 Year Post Implant
ESP Pattern Perception	100%	100%
ESP Spondee	50%	100%
ESP Monosyllabic Words	67%	100%
GASP Sentences	0%	40%
GASP Words	42%	67%
MLNT (Easy) Words		25%
MLNT (Easy) Phonemes		79%
MLNT (Hard) Words		42%
MLNT (Hard) Phonemes		80%

Table 1. Summary of post-implant scores for Child 3.

	1 Year Post Initial Fitting (4 months with HiRes)	3.5 Years Post Initial Fitting (2 years 9 months with HiRes)
PBK-Word	28%	80%
PBK-Phoneme	61%	94%
HINT-C	53%	91%
MLNT (Easy) Word		100%
MLNT (Easy) Phoneme		100%
MLNT (Hard) Word		92%
MLNT (Hard) Phoneme		98%

Table 2. Summary of post-implant scores for Child 4.

tinued to progress. Her scores after one year of implant use (and four months after switching to HiRes) appear in Table 2 and are compared to results obtained after 3.5 years of device use (two years, nine months of HiRes use). In addition, she was able to do sub-test VII (sequences three events) of the TAC a year ago with ease, but struggles on subtest 8 (recalls five details).

Child 4's programming has been straightforward on the whole. The only exception to this was a four-month period (27 to 30 months post initial stimulation) during which Child 4 repeatedly wanted more sound. During this time, her M levels were adjusted upwards several times but none of the adjustments seemed to alleviate her perception of sound as being too quiet. In an effort to address this issue, the pulse width was widened (from 10.8 to 21.6 µSec). Since that time, she has not required any changes to her program. Widening the pulse width has slowed down the rate of stimulation from 82,496 pulses/sec to 46,400 pulses/sec. The advantage of slowing the pulse rate benefited Child 4 and has benefited other pediatric patients who have etiologies other than AN in our practice.

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Tips from the Trenches

PRE-IMPLANT PREPARATION

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Many pediatric cochlear implant audiologists suffer from a shortage of time. We spend much of our day working directly with patients leaving little time for reports, paperwork, and responding to patient and professional phone calls. In this issue of *SoundWaves*, I would like to share some tips from the trenches that may help you to become more efficient during the pre-implant process, thereby helping to reduce a family's anxiety as they travel the journey toward better hearing.

Two years ago, I began working with cochlear implant recipients at the Lexington Hearing and Speech Center in Kentucky. Having never touched a speech processor, the learning process was overwhelming at the beginning. I found instructional repetition (seminars, reading materials, and hands-on training) was an essential part of my coming up to speed quickly in working with cochlear implant candidates and users.

Based upon my own experience, I have carried over the instructional repetition method with my CI families. Many times my first contact with a child and his/her family follows an otologic referral (from the local university) for pre-implantation speech perception testing. I have found that a phone call to the family prior to this appointment is critical. During the call, I introduce the family to our center, provide a contact name for assistance, and gather relevant information including prior test results, hearing-aid history, current services the child may be receiving, educational status, and basic expectations of the family. I instruct parents to have prior test results faxed to our center before the initial appointment (if possible) and remind them to bring their child's current functional hearing aids. This first contact gives parents a chance to connect with our facility in a more personal way and our center an opportunity to be better prepared for the child's initial appointment.

Many families travel great distances for the first speech perception evaluation with the expectation that their child will be implanted in the near future. Thus, it is important to use the time efficiently. I am fortunate to have a speech pathologist colleague (Shelby Rutledge) who administers some of the testing. While she tests the child, I have time to talk with the family about expectations, aural rehabilitation, and implant technology (a checklist is helpful). At the end of the first appointment, families take home information regarding 1) how their child functions with current hearing device(s), 2) general expectations about implant outcomes, 3) what type/amount of rehabilitation and commitment are needed following implantation to ensure development of communication with a cochlear implant, and 4) a return appointment (in one month) for a possible CI device consultation. The families also are given materials (printed brochures and videotapes from CI manufacturers), and later are mailed a copy of the report sent to the surgeon discussing test results and recommendations. Although a lot of information is given to a family to digest after one visit, the family has experienced two contacts with our center and can review all the information at home.

Once a child is approved for an implant, the family returns to our center for a device consultation. During this visit, the device is selected (with consideration of any restrictions by the surgeon regarding device type), communication intervention/therapies are reviewed, and a second appointment (prior to the initial stimulation) is scheduled for device instruction and a mapping timetable discussion. These two appointments may not be covered by insurance, but have actually reduced the overall time that I spend with families both during the initial stimulation and on the phone.

One final tip is to provide families with a device instructional video along with a Bionic Buddy prior to the initial stimulation. This way, when the family returns for the initial stimulation, they already have handled a speech processor at least twice and have watched the device video. Children (if old enough) usually can show me how to put the device on if they have played with Bionic Buddy.

Along with multiple clinic and phone contacts during the CI process, we try to reach out to our families in special ways as well. A personal touch that was added long before I entered the process is to have a staff member visit the family at the hospital during the implant surgery. This personal touch helps families know that we support them.

Recently, one of my coworkers reminded me of a very important fact that we as professionals sometimes forget. Families (especially parents) may resist coming to us because they do not want to admit that their child is not perfect. We all need to remember that children and families likely have different attitudes and emotions toward the acceptance of hearing loss. First and foremost, families need to be reassured that we are available to help their child. With open communication, preparation, and organization, we can strive to be worthy guides on the journey toward better hearing for families who choose a cochlear implant.

BIONIC HIGHLIGHTS

We welcome the following cochlear implant centers to the Advanced Bionics Family.

Pediatric Ear Nose & Throat of Atlanta
Atlanta, Georgia
Brian Herrmann, MD
Lisa Matesevac, MA, CCC-A

University of Illinois at Chicago
Division of Audiology (M/C 648)
Chicago, Illinois
Robert Williamson, MD
Sarah Drake, CCC-A

University of Louisville
Louisville, Kentucky
Mark Severtson, MD
Mary Beth Brinson, AuD, FAAA, CCC-A
Barbara Eisenmenger, AuD

Jones Institute for Rehabilitative Audiology, LLC
Birmingham, Alabama
Julibeth Jones, MA

Arkansas Children's Hospital
Little Rock, Arkansas
John Dornhoffer, MD
Steve Upson, MA/MS
Sue Faulkner, MS
Seema Katiyar, MCD

University of Arkansas Medical Center
Little Rock, Arkansas
John Dornhoffer, MD
Christopher Danner, MD
Steve Upson, MA/MS
Sue Faulkner, MS
Seema Katiyar, MCD

St. Louis University
St. Louis, Missouri
Anthony Mikulec, MD
David Harris, PhD

Chaleur Regional Hospital
Bathurst, New Brunswick
Canada
Annie Giasson, MOA
Wendy Frenet, MS

Phoenix Children's Hospital
Phoenix, Arizona
John Macias, MD
Phil Daspit, MD
Mark Syms, MD
Mike Sabo, MS, CCC-A
Melissa Wait, MS, CCC-A
Christine Santana, Program Coordinator

Kaiser Permanente Hearing Center
Santa Clara, California
Jennifer Maw, MD
Rebecca Meredith, AuD

Kaiser Permanente Hearing Center
Hayward/Union City, California
Maya Kato, MD
Barbara Slaymaker, MS, CCC-A

Focus on Arkansas Children's Hospital Cochlear Implant Program

Elaine Leander
Regional Manager, South Central Region

Advanced Bionics is pleased to welcome Arkansas Children's Hospital to the family of implant centers that offers the HiResolution Bionic Ear System. While Arkansas Children's Hospital is new to Advanced Bionics, it has a long history of providing implant services to the children of Little Rock and the surrounding area. The program was started in 1990 and, over the past 15 years, has implanted approximately 200 children.

Patti Martin is the Director of Audiology at the hospital. She has an extensive cochlear implant team consisting of audiologists (Steve Upson, Seema Katiyar, and Sue Faulkner), speech/language pathologists (Tracy Pate, AVT, Michelle Leach, AVT, Matthew Reel, and Erica Studer), a social worker (Eileen Turner) and a child-life specialist (Camille Dante). The surgeon is Dr. John Dornhoffer. Audiologist Steve Upson believes that the strength and depth of the team contributes to the success of their program. Because of the ready access to talented speech pathologists, the program requires a three-month hearing aid trial with intense speech therapy prior to implantation. The team also requires speech language therapy after the implant surgery. The duration of therapy depends on how the child progresses and the quantity and quality of services received elsewhere.

Dr. Dornhoffer and Dr. Christopher Danner implant adults at the University of Arkansas Medical Center and those adults are programmed at Arkansas Children's Hospital. The adults have access to the post-implant therapy offered by the speech pathology team. Steve claims that programming adults provides him with wonderful feedback that he then can use when programming children. It also provides him with a pool of adults willing to come in when he needs to practice new programming strategies or tools.

When asked what tips he could offer others working with young children, Steve insists that being able to use two audiologists during programming is very important to obtaining accurate results. He also indicated that one of his favorite tools while working with children is a portable visual reinforcement box with a footswitch that can be moved from room to room.

Advanced Bionics and the South Central team look forward to a long relationship with this very skilled center.

Web Class Update

ANNOUNCING OUR 2005 WEB CLASSES!

The Bionics Education Team would like to invite you to join our monthly web class series for professionals. These classes are offered the 2nd Friday of every month (9 am and 12 pm PST) on various topics of interest. Each session is free, one hour in duration, and is offered for 0.1 AHSA and AAA CEUs. Additionally, these classes will be recorded for those unable to attend a live session. For a listing of our current offerings and to register, visit our website at www.bionicear.com/professionals. To participate in these courses, we recommend a PC with high-speed internet access and a sound card. Our topics for the remainder of 2005 are listed to the right. We hope to see you there! For further information, please contact Carissa Moeggenberg at Carissam@advancedbionics.com.

Web class topics for 2005:

July 8: Mentoring Students and CIs

August 12: Bilateral Cochlear Implants

September 9: Programming the Multiply Involved

October 14: Optimizing Your Clinic Time

November 11: Maximizing CI Reimbursement

December 8: Learning to Hear Again With a CI

SoundWaves Survey

SHARE YOUR EXPERIENCE!

Beginning with this issue of *SoundWaves*, we will pose one question frequently asked by cochlear implant clinicians across the country. This issue's question is:

Do you recommend that cochlear implant recipients discontinue wearing a hearing aid for a specified period of time following initial stimulation, or that they continue to wear a hearing aid in the contralateral ear?

To share your answers and opinions, please:

- Visit *www.bionicear.com*
- Select *Information Center*
- Go to *Hearing Professionals*
- Select *SoundWaves Survey*
- Submit response

Your feedback is valuable and can be helpful to other clinicians who may be facing the same issues. A summary of answers to the question will be included in the next issue of *SoundWaves*.

Product Updates

Bionicear.com has a new look and more user-friendly navigation. It features easy links to our Clinic Locator, Event Calendar, and webstore. In addition, you can now watch our videos from our website. In the next few weeks, watch for exciting news about the gateway to 120 channels, *wireless Bluetooth and FM connectivity, and more. Be sure to visit often!

*Under development.

The Auria iConnect™ with the Phonak MicroLink MLxS

Advanced Bionics is pleased to announce the introduction of the Auria iConnect™ in the United States. The product will begin US shipment in the middle of September. The Auria iConnect provides cable-free access to the Phonak MicroLink MLxS, the most common advanced miniaturized FM receiver used in schools. With a separate power source, the device provides reliable FM reception without compromising regular power consumption. The iConnect attaches securely to the HiRes® Auria® to enable active children to participate in daily school activities confidently.

Canadian introduction of the iConnect is anticipated to begin at the end of the year.

To order products online, visit ***www.bionicear.com***
or contact our customer service department.

UPCOMING EVENTS

Advanced Bionics Workshops

October 19–21: Introduction to Cochlear Implants and HiResolution Bionic Ear System, Valencia, California

National and International Meetings

September 24–28: American Academy of Otolaryngology, Los Angeles, California

October 19–23: International Hearing Society (HIS), Quebec City, Quebec, Canada

November 17–19: American Speech Language Hearing Association (ASHA), San Diego, California

November 26–28: Fifth Asia Pacific Symposium on Cochlear Implants and Related Sciences, Hong Kong, China

March 25–28, 2006: Pediatric Cochlear Implantation European Symposium, Venice, Italy

June 14–17, 2006: Ninth International Conference on Cochlear Implants, Vienna, Austria

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