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Cochlear Implants and Children: A Brief Overview

Early newborn hearing screening has had a direct impact on habilitation options for children who are deaf, specifically with regards to cochlear implants. As the age at identification of hearing loss has decreased, so has the age at which children are receiving cochlear implants. The following review will provide a brief overview of the history of cochlear implants, candidacy, the evaluation, surgical, and habilitation process, and the factors that lead to success for children.

The cochlear implant is a prosthesis that provides direct electrical stimulation to the auditory (8th) nerve. Researchers first began investigating the viability of electrical stimulation of the cochlea in the 1950s. Since then, technology has rapidly progressed to the point at which cochlear implants are now considered a standard treatment option for people with severe or profound hearing loss. Currently, there are three devices in the United States that are used. Cochlear Corporation's Nucleus device has been approved by the Food and Drug Administration (FDA) since 1984, while Advanced Bionics Corporation gained approval in 1996. The most recent device to obtain FDA approval is the Advanced Combi 40+ by the Med-El corporation.

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Advisory Update

The next meeting of the Iowa Early Hearing Detection and Intervention Committee is:

July 9, 2009

10 a.m. - 3 p.m., Location: Iowa Lutheran Hospital, Conference Room 1

July						
S	M	T	W	T	F	S
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5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

Past meeting agendas, minutes and a list of committee members are available online! Visit www.idph.state.ia.us/iaehdi.

Cochlear Implants and Children: A Brief Overview

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The criteria for cochlear implant candidacy have evolved over the years. It was initially designated only for adults with profound bilateral hearing loss. Candidacy was then expanded to include children in the late 1980s. For adults, the current criteria require candidates to have a severe-to-profound bilateral sensorineural hearing loss. They must receive little to no benefit from hearing aids and score 50% or less on a sentence recognition test in the ear that is to be implanted. For children ages 2 to 17 years, the criteria are similar, with the additional requirement that they must demonstrate a lack of progress in the development of auditory skills. The criteria for children between the ages of 12 to 24 months are more conservative. Children in this age range must have a profound hearing loss and their families must be motivated to participate in the aural habilitation process following implantation. However, physicians can perform the surgery at younger ages when it is deemed necessary (usually in cases of cochlear ossification following meningitis).

The evaluation process for pediatric candidates at the University of Iowa typically consists of an audiologic evaluation, including ear-specific aided and unaided thresholds, a minimum three-month hearing aid trial, a speech and language evaluation, an otologic examination, and a CT scan to establish the patency of the cochlea and presence of the auditory nerve. The cochlear implant surgery is performed under general anesthesia. It is typically three to four hours in length and usually involves a one-night hospitalization. Surgical risks include loss of residual hearing in implanted ear, facial nerve stimulation, and risks associated with the use of anesthesia.

Part of the cochlear implant process involves counseling families to have realistic expectations. In most cases children will have pure-tone

thresholds between 250 and 4000 Hz in the mild hearing loss range, usually between 20 and 40 dBHL. It is also important for families to realize that the surgical procedure is just the first step in a long process. There is an intensive habilitation process following the surgery, particularly for children who have had no auditory experience. Programming the cochlear implant, also known as “mapping,” requires frequent adjustments. Audiologists must program the device very softly at first, and then gradually increase loudness over time. Providing too much auditory stimulation in the early stages can lead to immediate rejection of the implant. Some children adjust very quickly to their new programming parameters, while others require several weeks or months to adapt. Pediatric patients are seen approximately 4 to 6 weeks following the surgery (termed the “initial stimulation” appointment), which allows time for the surgical incision site to heal. From that point on, children are seen two weeks after the initial stimulation, then one month, two months and then every two months until one year after receiving the cochlear implant. After two years, children are seen annually unless there are problems with the device.

Children show the most gains in the first 3 years following surgery, but we continue to see growth in speech and language skills up to 8 years after surgery (Tomblin, Peng, Spencer, & Lu, 2008). A major area in the pediatric cochlear implant literature involves determining which factors lead to successful outcomes. One of the most significant factors appears to be the age at which a child receives the device. Tomblin et al. (2005) reported that earlier implantation led to faster growth in expressive language skills. Other researchers have looked at how educational factors relate to auditory performance with CIs (Geers, Brenner, & Davidson, 2003). Geers and colleagues examined three main factors: therapy, educational setting, and communication mode. Of these variables, only communication mode was found to account for a

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Natus Medical Inc. will no longer sell the Sonamed Clarity System/Screener

If you currently use the Sonamed Clarity System/Screener, you should have received a letter in October 2008 regarding instructions for use based on claims submitted and cleared through the FDA's 510k process. According to its clearance, Clarity is intended to be used as a screener for auditory function by Audiologists or trained health care professionals knowledgeable of audiometers and skilled in their use. Results generated by the Clarity should be confirmed by visual inspection of the screening data.

Natus was unable to find published or otherwise documented sensitivity and specificity rates for the detection of hearing impairment in newborns for the Clarity screener. In the absence of such data, Natus cannot make or support any claims regarding the sensitivity and specificity of

automated screening results generated by the Clarity Screener and Clarity System.

As a result, Clarity hearing screeners do not meet Joint Committee on Infant Hearing (JCIH) guidelines stating that "Interpretive criteria for pass/fail outcomes should reflect clear scientific rationale and should be evidence based" in programs following JCIH recommendations for automated response detection. Given these facts and based on information from customers gathered since they mailed the notice, Natus decided to discontinue sales of the device January 1, 2009. They will continue to service the Clarity system for a period of five years. If Clarity customers have further questions, please call (800) 272-8075.

Working Behind the Scenes at EHDI

Meet Jini Cox; support staff for the EHDI program. Jini has worked behind the scenes of the EHDI program for the past five years. Her attention to detail and ability to multi-task serve the EHDI program well. Jini started out entering paper newborn hearing screening forms. As the EHDI program expands, so do Jini's responsibilities.

If you work for an Area Education Agency, you may recognize Jini as the one who sends you referrals for children who were missed at birth or who "referred" and have not yet returned for a follow up hearing screening. Jini works with Erin Kongshaug to put together the referral forms. If you work for a hospital, you may recognize Jini as the one who communicates with you if there are babies missing from eSP following a comparison between the records in eSP and vital records reports. Jini is also responsible for: recording child deaths that have not been previously reported, quality assurance checks (ensuring children are moved from inpatient to outpatient, merging duplicate records, ensuring PCPs are listed in the patient records) and she is also working with Tammy O'Hollearn to develop a hearing healthcare directory. In addition to Jini's work with the EHDI program, she also provides support to Iowa Department of Public Health (IDPH) Child Health Advisory Team, EPSDT (Early Periodic Screening Diagnosis and Treatment) and other program staff members within IDPH, Bureau of Family Health.



ECHO Training Being Piloted in Iowa Early Head Start Programs



You might be saying “no,” not another acronym! In this case, ECHO is a good thing for the children of Iowa. ECHO stands for Early Childhood Outreach (ECHO) Training and Technical Assistance. The ECHO program was designed by the National Resource Center for Early Hearing Detection and Intervention with funding from the Office of Head Start. The program was designed to assist Early Head Start, Migrant/Seasonal Head Start and American Indian/Alaska Native Head Start programs in updating their hearing screening practices for children 0-3 years of age through the use of Otoacoustic Emissions (OAE) screening technology. Traditionally, more programs have had to rely on subjective screening methods; however, recent feasibility studies have demonstrated that Head Start staff members can be trained to successfully update their screening practices using objective OAE screening methods. As a result, increasing numbers of children with hearing disorders have been identified, including children with sensorineural hearing loss and a range of other conditions.

ECHO teams are being established in conjunction with state EHDI programs across the United States. Iowa is the nineteenth state to participate in the ECHO training. On February 25, 2009, four pilot Early Head Start programs (Mid-Iowa Community Action (MICA), Marshalltown; Community Action of Siouxland, Sioux City; Tri-County Child and Family, Waterloo; and Peterson Center, Council Bluffs), Early Head Start Consultant (Tom Rendon), State EHDI Coordinator (Tammy O’Hollearn), EHDI Pediatric Audiology Technical Assistant (Emily Andrews), Audiology Consultant for Deaf and/or Hard-of-Hearing Education (Marsha Gunderson) and Early Head Start Training Coordinator (Beth Walling) came together at MICA in Marshalltown to participate in the ECHO training provided by NCHAM personnel. The initial training was a big success! In the coming months, the pilot sites will roll out this initiative in their programs. Upon successful implementation within the pilot sites, the initiative will expand to all Iowa Early Head Start programs. If you would like to find out more about the ECHO project, visit www.infanthearing.org/earlychildhood/hss_currentactivities.html#state or call Tom Rendon at (515) 242-6024 or Tammy O’Hollearn at (515) 242-5639.



A Sound Beginning for Your Newborn Baby

To order additional hearing screening brochures in English or Spanish, please call the Healthy Families Line at 1-800-369-2229. Ask for publication IDPH 131 (English) or IDPH 131(S) (Spanish). The brochure is available free of charge!

Healthy Families Line: 1-800-369-2229

Phones are answered 24 hours a day, seven days a week

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significant proportion of the variance in speech perception scores. Children using an oral-aural communication mode tended to achieve higher scores on speech perception measures. In addition, children with more residual hearing prior to surgery have more favorable prognosis for success (Holt et al., 2005).

Recently, there has been a move towards providing cochlear implants for both ears. Research has indicated that adult patients with two cochlear implants show advantages over patients with one implant in quiet listening situations, when localizing sounds (Dunn et al., 2008), and when listening in noisy environments (Litovsky et al., 2005). Bilateral cochlear implants in children remain controversial. This is due in part to the fact that the implant surgery destroys any residual hearing, thus eliminating any opportunities to benefit from future medical interventions such as hair cell regeneration. As more studies emerge demonstrating the benefits of bilateral implants in both adults and children, it is likely that we will see increasing numbers of children receiving two cochlear implants.

Works Cited

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Article by Elizabeth Walker

Infant Hearing Screening Equipment Loaner Program

Are you having problems with your hearing screening equipment? The Iowa EHDI program has a limited number of loaner screening OAE units available for hospitals to use while their screening equipment is being repaired.

There is no charge for borrowing the equipment.

For information about loaner units, please contact:

Marilyn Dolezal - (319) 353-6233

Lenore Holte - (319) 356-1168

Emily Andrews - (319) 384-6894

Nick Salmon - (515) 576-5312

Early ACCESS Iowa

Your single point of contact to assist families in connecting with Early ACCESS and community-based services that address specialized child and family needs

1-888-IAKIDS1 or
1-888-425-4371

www.EarlyACCESSIowa.org

Alexander Graham Bell Association for the Deaf and Hard of Hearing

Give me an A – give me a G – and then honk the horns, hoot and holler, and ring the BELL as AG BELL of Iowa was approved as an official chapter at the annual AG Bell Conference held in Wisconsin in June 2008

In cooperation with the partnerships of AEA 9, AEA 10, and the University of Iowa Otolaryngology Department, professionals and parents discussed the possibility of forming an AG Bell Iowa Chapter. After a preliminary meeting in November 2007 in Iowa City, interest was confirmed to initiate an Iowa affiliate chapter. Individuals were nominated for and elected to offices for the AG Bell Chapter of Iowa. Tim Brandau, President, provided leadership in presenting the Chapter Resolution, Chapter Bylaws, and the Articles of Incorporation which were required for chapter approval.

Other officers elected were: President Elect Ed Szypulski, Secretary Maura Kenworthy, Treasurer Tanya Van Voorst, Director of Membership Dani Kelsay, Website Developer Kristine Parsons, Public Relations Kim Lestina, and Board Members Marcy Clausen, Stacy Herrin, Patty Malmen, and Elizabeth Walker.

At the first Board Meeting in December 2007, AG Bell of Iowa also developed their mission:

“Our mission is to advocate for children and adults who are deaf or hard of hearing in the State of Iowa by connecting families and professionals. Our goals include promoting the development of listening and speaking skills in individuals who are deaf or hard of hearing, as well as public awareness, early detection, and intervention of hearing loss.”

Give me an A - give me a G!



In December 2008, AG Bell of Iowa was faced with a dual challenge with the resignation of President Brandau due to his relocation to Texas for an employment opportunity and the resignation of President Elect Szypulski due to health concerns.

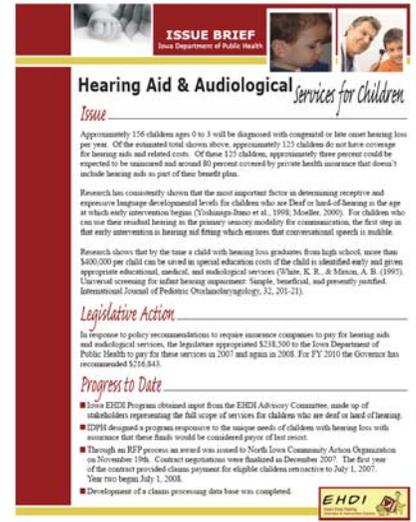
The above mission drives our goals for the future. Board meetings have been held during the 2007-08 years in order to finalize necessary required documents for the Chapter recognition. Additionally, the website for AG Bell of Iowa was developed. The URL for the website is www.iaagbell.com. Beginning in the year 2009, agenda items include reviewing officers' positions, securing a logo, and scheduling two events for families and professional during the upcoming year.

If you have additional questions about the Iowa Chapter, please do not hesitate to contact us at agbell.iowa@gmail.com.

Hearing Aids and Audiological Services Funding

In response to policy recommendations to require insurance companies to pay for hearing aids and audiological services, the legislature appropriated \$238,500 to the Iowa Department of Public Health to pay for these services again in 2008. That funding period began July 1, 2008 and runs through June 30, 2009 or until funding runs out. For FY 2010 the Governor has recommended \$216,843. Be aware that this recommendation could change if further budget reductions are necessary.

The EHDI program prepared an issue brief which outlines the issue, research regarding early intervention needs of children who are Deaf or hard-of-hearing, legislative action, progress to date, program data through the first year of existence and recommendations for future action. You can view the issue brief at www.idph.state.ia.us/common/pdf/ha_issue_brief.pdf.



Guide by Your Side from the Family Perspective

Guide By Your Side is a support program for families of children with hearing loss. Guides (parents of children with hearing loss or adults who are Deaf or hard-of-hearing) provide unbiased information and emotional support. GBYS is free to Iowa families. A referral form and "Q & A" sheet are available at www.idph.state.ia.us/iaehdi/program.asp. You can also contact Melissa Carlson or Erin Kongshaug for more details (contact information is listed on the back cover of this newsletter). This family story was submitted by Sarah Johnston. Her family worked with a GBYS guide after learning of their son's hearing loss.



When we first found out about our son's hearing loss, we were at first shocked, then saddened and then confused. There were so many decisions to make and information to absorb and we knew no one who was dealing with a similar situation. When AEA personnel informed us of a program called Guide by Your Side (GBYS), I knew I was interested. I wanted to be able to connect with parents who were facing the same thing we were. I wanted to be able to ask questions of someone who had been through it all previously. All of our AEA personnel, doctors and audiologists were great, but there is not substitute for first hand knowledge. My only regret was that I did not contact GBYS sooner. The piece of mind I received from talking with GBYS personnel was instrumental in this journey we are taking. In addition, I love knowing I can contact GBYS for any future questions or help I may need. The GBYS program is a great resource for parents of children who are deaf or hard of hearing and I would encourage everyone to access the program.

Contact Information

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**Requests?
Feedback?
Comments?
Suggestions?**

We welcome your questions, comments and suggestions about this newsletter. Please forward any feedback about Iowa EHDI News to:

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Additional copies of Iowa EHDI News are available by contacting Tammy O'Hollearn.