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**Young Children with Conductive Hearing Loss:
What are the Technology Options?**

George Cire, Au.D., Clinical Technical Manager
Bone Anchored Solutions, Cochlear Americas


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Introduction
Cochlear America's Commitment
to Educational Outreach


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George Cire, Au.D




- Clinical Technical Manager, Bone Anchored Solutions, Cochlear Americas
- Fellow, American Academy of Audiology
- Member and CCC/A, American Speech-Language-Hearing Association
- Award for Continuing Education ASHA
- Thirty-two years serving as an Audiologist in both private practice and industry
- gcire@cochlear.com

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Agenda





- The Ear with Conductive Hearing Loss
- The Audiogram
- Treatment Options
- Baha, How Does It Work?
- Fitting and Management Considerations
- Case Studies
- Areas for Research
- Questions




THE EAR

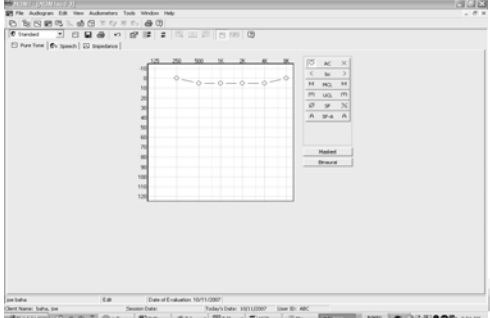








THE AUDIOGRAM








Conductive Hearing Loss


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- Something is blocking the transmission of airborne vibration of air particles striking the Ear Drum (tympanic membrane)
- Wax (Cerumen) or other debris
- Malformed or blocked ear canal
- Collapsing ear canal




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Conductive Hearing Loss


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- Something is blocking the transmission of airborne vibration of air particles striking the Ear Drum (tympanic membrane)
- Tympanic membrane perforation
- Tympanosclerosis
- Cholesteatoma
- Disarticulation or malformation of the ossicles.
- Surgical alteration of the middle ear for disease management




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Treatment Options Conductive Loss


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- Medical/Surgical: Removal of foreign body, surgical alteration of ear canal (Canalplasty)
- Myringotomy with vent tubes (Pressure Equalization Tubes PE Tubes)
- Tympanoplasty
- Mastoidectomy
- Middle ear reconstruction
- Amplification (hearing aid fitting)


Note: Amplification will be dependant upon the condition of the outer/middle ear. If infection and/or drainage is present, this may contraindicate use of traditional air conduction hearing aids




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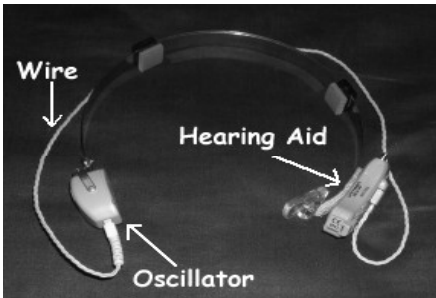



Bone Conduction Amplification




Traditional Bone Conduction Hearing Aid








Traditional Bone Conduction Hearing Aid



This device is a conventional Air Conduction hearing aid (Power Device) that has been modified to drive a Bone Conduction Oscillator. All of this is mounted to a spring steel band and is worn on the head. The spring steel band produces sufficient force to allow the vibration from the oscillator to drive the skull.

Net Result: A VERY tight fit, often resulting in discomfort.



Traditional Bone Conduction Hearing Aid

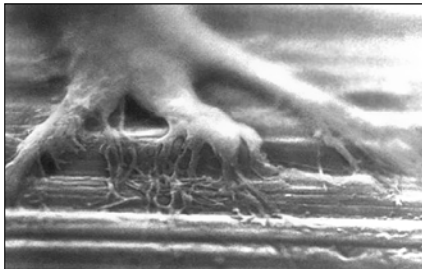


Due to the configuration of traditional Bone Conduction devices, long term compliance with wearing has been a problem.

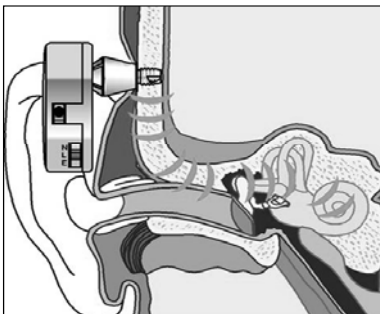
There is also a loss of vibratory energy because of the soft tissue between the oscillator and the actual skull.



Bone Anchored Hearing System



Bone Anchored Hearing System



Bone Anchored Hearing System



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- Since this approach requires a surgical procedure, there exist specific criteria for candidacy for the procedure
- The recipient must be 5 years or older and should have healthy bone
- The recipient should be able to support good personal hygiene in the maintenance of the abutment site

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Baha System FDA Indication Criteria *Mixed and Conductive Hearing Loss*

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- ≥ 5 years of age
- ≤ 45 dB HL BC pure tone average (PTA) (.5, 1, 2 and 3K Hz)
- For bilateral fitting - Symmetric bone conduction thresholds are defined as less than 10 dB difference in the PTA (.5, 1, 2, and 4K) or less than 15 dB at individual frequencies.

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Bone Anchored Hearing System

Soft Band




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Bone Anchored Hearing System

Since the Baha Sound Processor can be mounted on a steel test band or the Soft Band, a potential candidate can be evaluated or may trial the device to determine clinical outcome. This is the only implantable hearing system where this can be done.

For children under 5 years of age, the Soft Band may be used until the child is 5 when implantation of the fixture can be accomplished.


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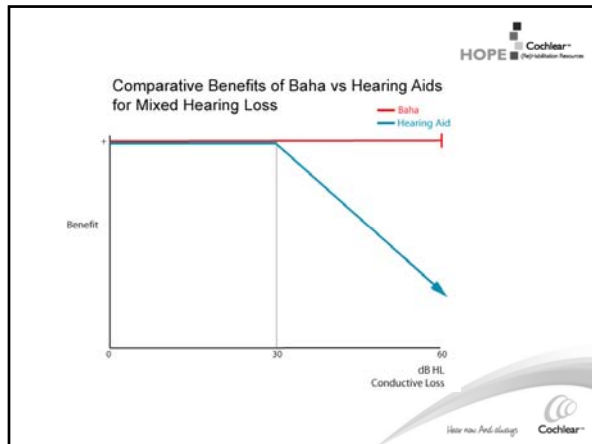
Bone Anchored Hearing System

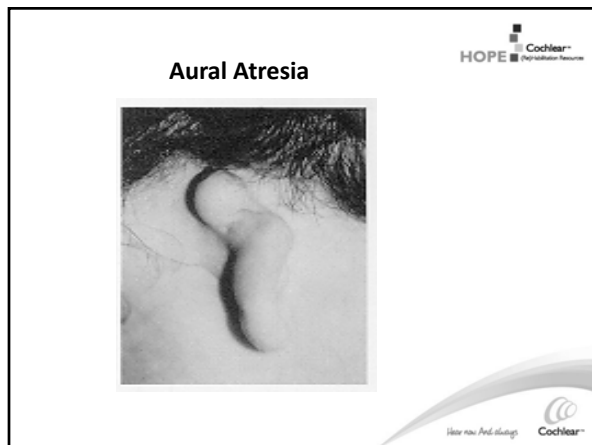
The use of a bone anchored solution will usually provide a better functional gain result when compared to a fitting of a traditional bone conduction fitting.

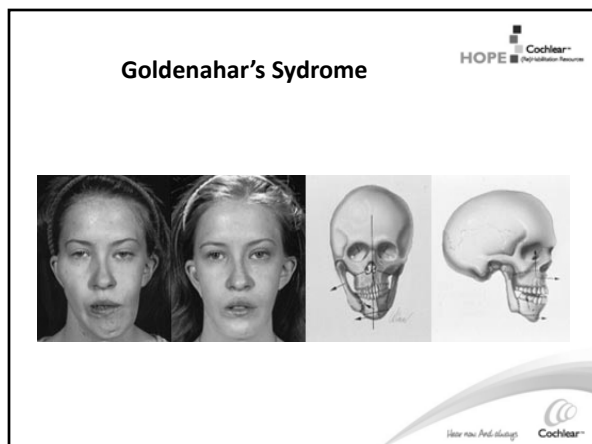
The improved result in bone anchored solutions now positions this treatment in a favorable light.

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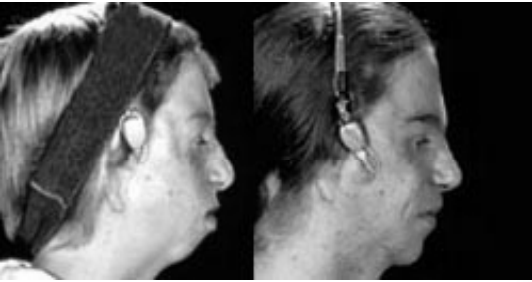
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Treacher-Collins Syndrome



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**Case Studies from
Arkansas Children's Hospital**

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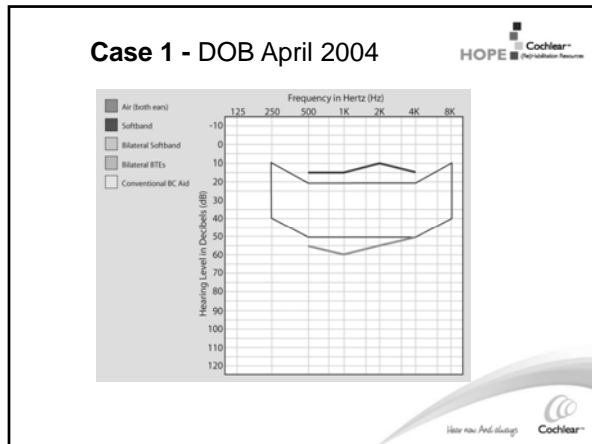
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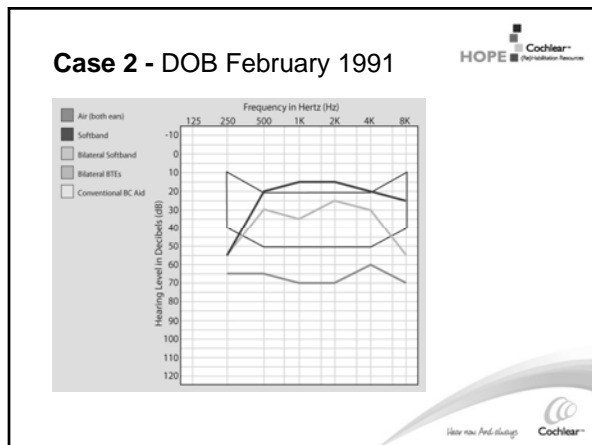
Arkansas Children's Hospital

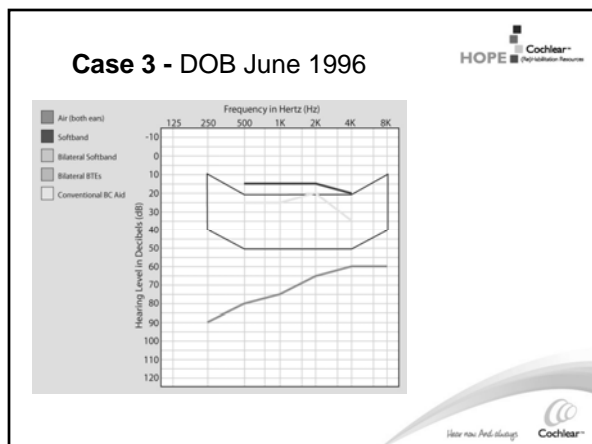
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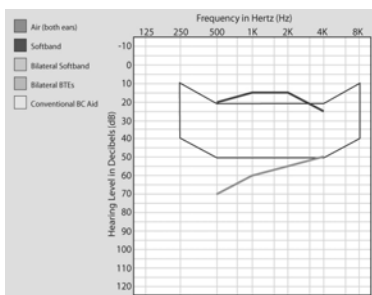
- Arkansas Children's currently following ~100 children utilizing Baha for "permanent" hearing loss
- 60 have or began with Softband
- Treating children with a range of etiologies (i.e., conductive—unilateral or bilateral, SSD, Treacher Collins, atresia)
- Following case studies represent range of children served

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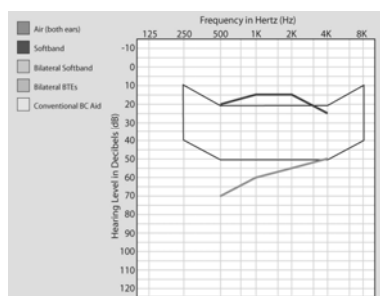






Case 4 - DOB March 2006HOPE Cochlear
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**Case 5- DOB December 2004**HOPE Cochlear
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**Related HOPE Online Seminars (Archived)**HOPE Cochlear
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- Pediatric Baha: Softband to Implantation (Christensen)
- Mixed Hearing Loss in Children: What are the Options? (Cire)
- Using Baha in Young Children: Research and Clinical Considerations for Early Intervention Professionals (Cire)

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Upcoming HOPE Online



Wednesday, February 2, 3:00 pm ET

Preparing Students to be Successful in their Learning Environments

Cheryl DeConde Johnson, Ed.D., The ADVantage – Audiology, Deaf education Vantage-Consulting

Wednesday, February 16, 3:00 pm ET

The Ins and Outs of Language Sampling

Ashley Garber, M.S., CCC-SLP, Cert. AVT, Listening and Language Connections

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Early Intervention Workshops 2011



- Facilitating Spoken Language Development for Young Children with Hearing Loss
- One Day Introductory Seminar for Early Intervention and Educational Professionals
- Three More Sites: Albuquerque, NM (Mar 15), San Marcos, TX (March 16), Fairfax, VA (May 18)
- For more information, go to www.regonline.com/hopeworkshops
- Or call Sarah Gard at 303.524.6848, sgard@cochlear.com

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Helping Adults and Children with Cochlear Implants Enjoy Music Workshops 2011



- One day workshops for professionals; evening (or half day) workshops for adults and parents
- Four more sites scheduled so far (watch for more)
- Toronto (Feb 11/12), Ann Arbor, MI (April 12/13), Houston (April 26/27), Oklahoma City (April 28)
- For more information, go to: www.regonline.com/hopeworkshops or call Sarah Gard at 303.524.6848, sgard@cochlear.com

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Contact Cochlear



- For questions about this seminar, please contact: gcire@cochlear.com
- For inquiries and comments regarding HOPE programming, please contact: dsorkin@cochlear.com
- For a Certificate of Participation, please send your completed Feedback Form to:
- hopefeedback@cochlear.com



Questions?



THANK YOU!