



Sunrise Sessions

Inside Research at
Utah State University



Regence

Early Identification of Children's Hearing Loss: A Silent Revolution



presented at the

Sunrise Session:

Inside Research at Utah State University

by

Karl R. White

Director, National Center for Hearing Assessment and Management

Professor of Psychology

www.infanthearing.org

September 28, 2006

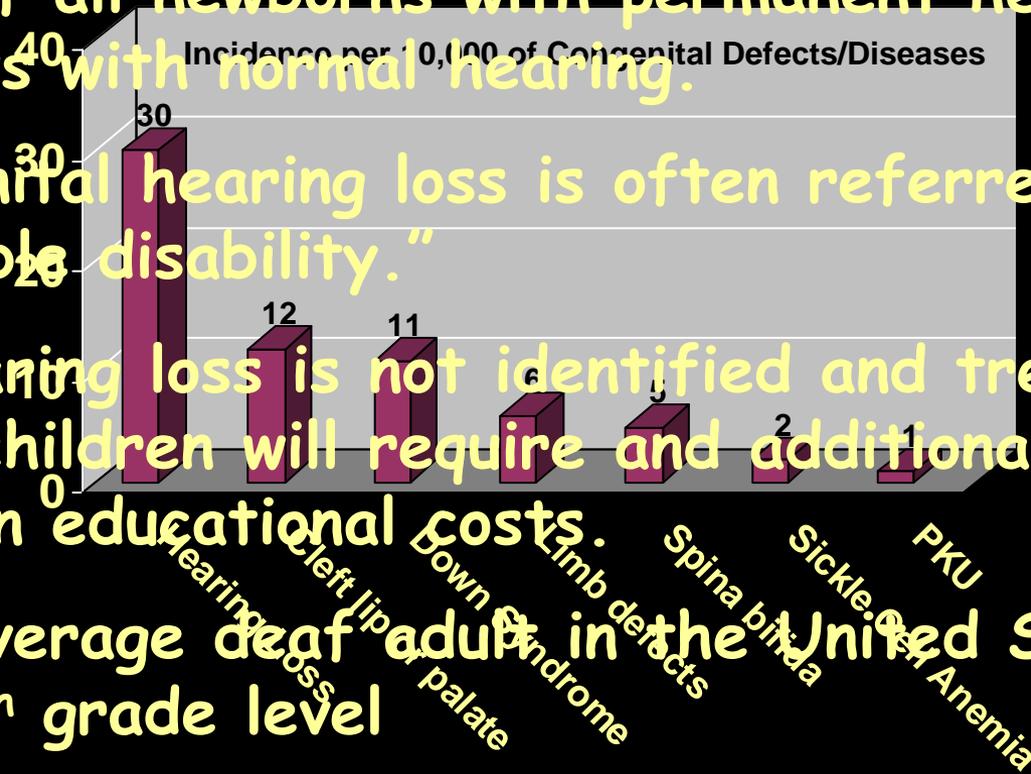
**Blindness separates people from things.
Deafness separates people from people.**

--- Helen Keller



Little Known Facts About Congenital Hearing Loss

- Permanent hearing loss is the most frequent birth defect in the United States.
- 95% of all newborns with permanent hearing loss have parents with normal hearing.
- Congenital hearing loss is often referred to as an "invisible disability."
- If hearing loss is not identified and treated early, deaf children will require an additional \$400,000 per child in educational costs.
- The average deaf adult in the United States reads at the 4th grade level





**Montreal School
For the Deaf**
Group 4 1977-78



A young girl with blonde hair, wearing a pink shirt, is looking towards the camera. In the background, a younger child with dark hair, wearing a white shirt and dark overalls, is looking towards the camera. The background shows a classroom setting with a wooden cabinet and various items on it.

Spring is my favorite season. The sun shines bright. The flowers begin to grow. I like spring.





What enabled us to move from



There



Here?

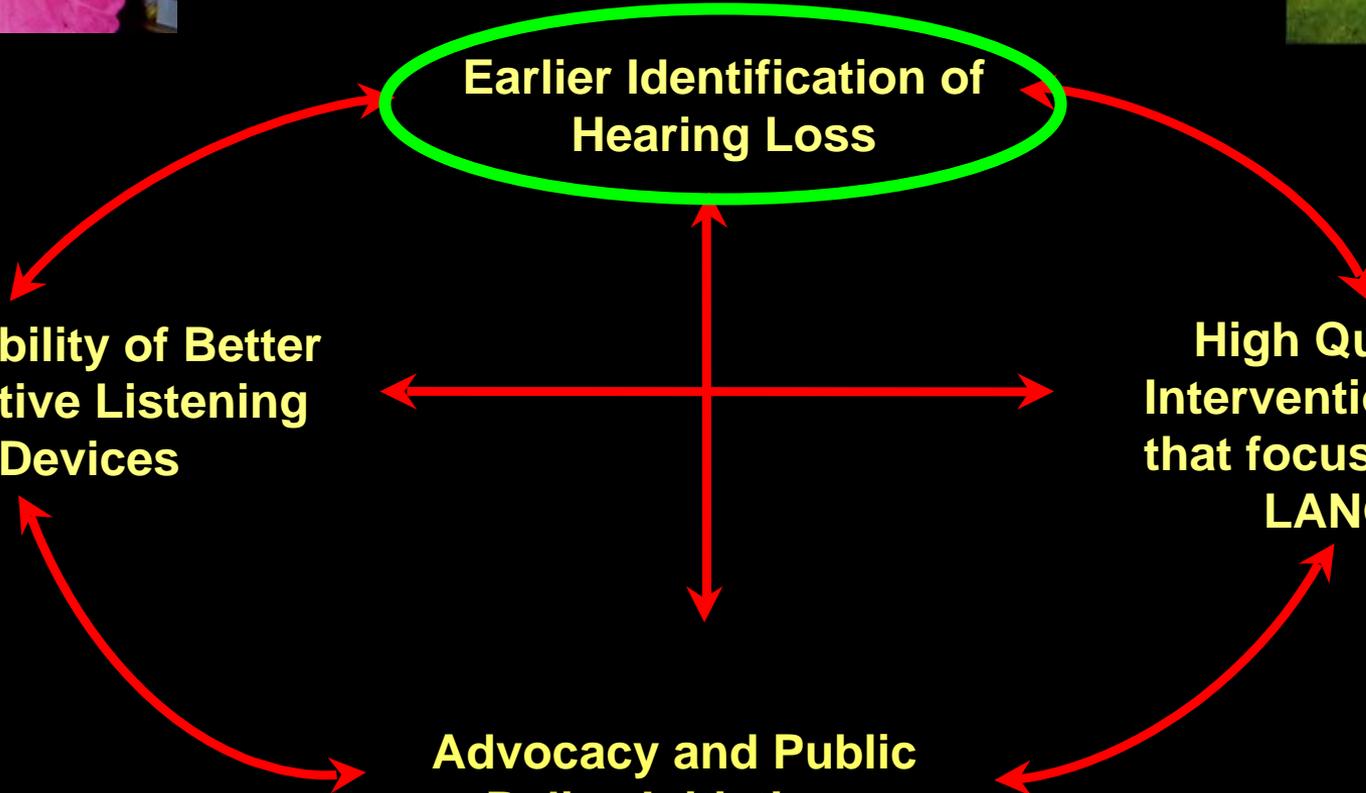


**Earlier Identification of
Hearing Loss**

**Availability of Better
Assistive Listening
Devices**

**High Quality Early
Intervention Programs
that focus on teaching
LANGUAGE**

**Advocacy and Public
Policy Initiatives**



How does your
baby hear sound?



From 1988-1993 USU conducted the first large-scale clinical trial of universal newborn hearing screening -- the Rhode Island Hearing Assessment Project ---

SEMINARS IN HEARING—VOLUME 14, NUMBER 1 February 1993

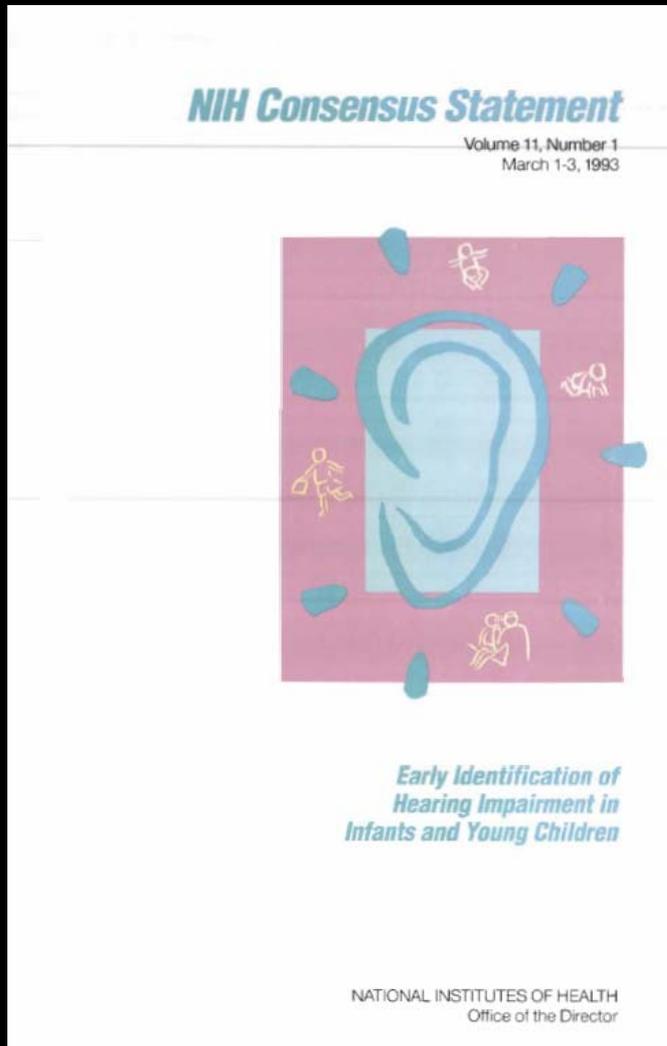
UNIVERSAL NEWBORN HEARING SCREENING USING TRANSIENT EVOKED OTOACOUSTIC EMISSIONS: RESULTS OF THE RHODE ISLAND HEARING ASSESSMENT PROJECT

Karl R. White, Ph.D., Betty R. Vohr, M.D., and Thomas R. Behrens, Ph.D.

The earlier that hearing loss can be identified and intervention begun, the better the prognosis for the child in areas ranging from language development to academic success, social interactions, and successful participation in society.¹ Indeed, early identification of significant hearing loss is so important that the U.S. Department of Health and Human Services (HHS) recently set a goal to reduce to 12 months the average age at which significant hearing loss is identified.²

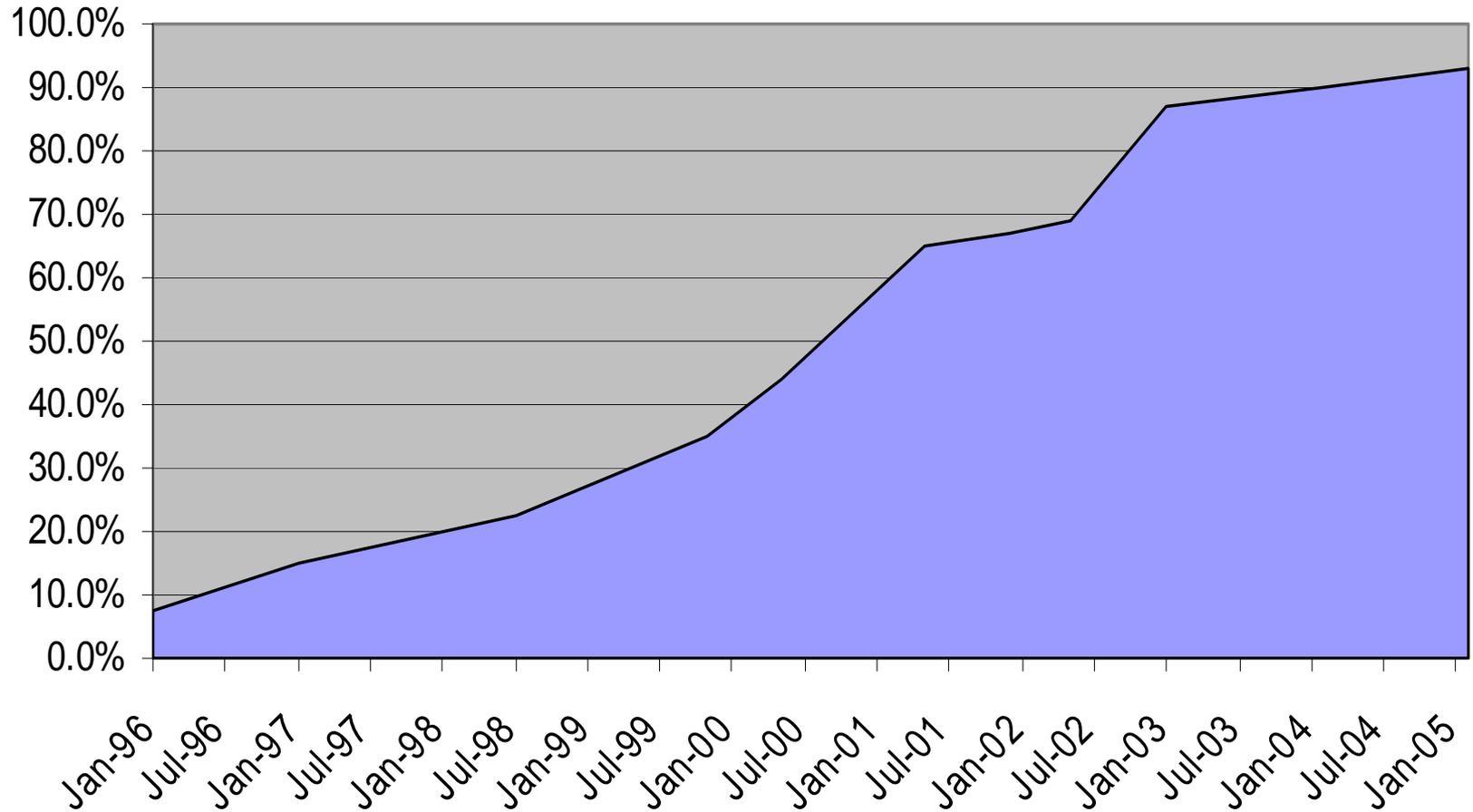
of using auditory brainstem response (ABR) to identify hearing loss among infants and toddlers.^{4,5} Such research certainly contributed substantially to the American Speech-Hearing Language Association's (ASHA) recommendation of ABR as the preferred method for screening the hearing of newborns.⁶ However, the expense of doing ABR testing of newborns was very likely what led to ASHA's recommendation that it be done only with infants who exhibit one of the ten risk fac

Based largely on the results of this study conducted by Utah State University, the National Institutes of Health concluded in March 1993 that:

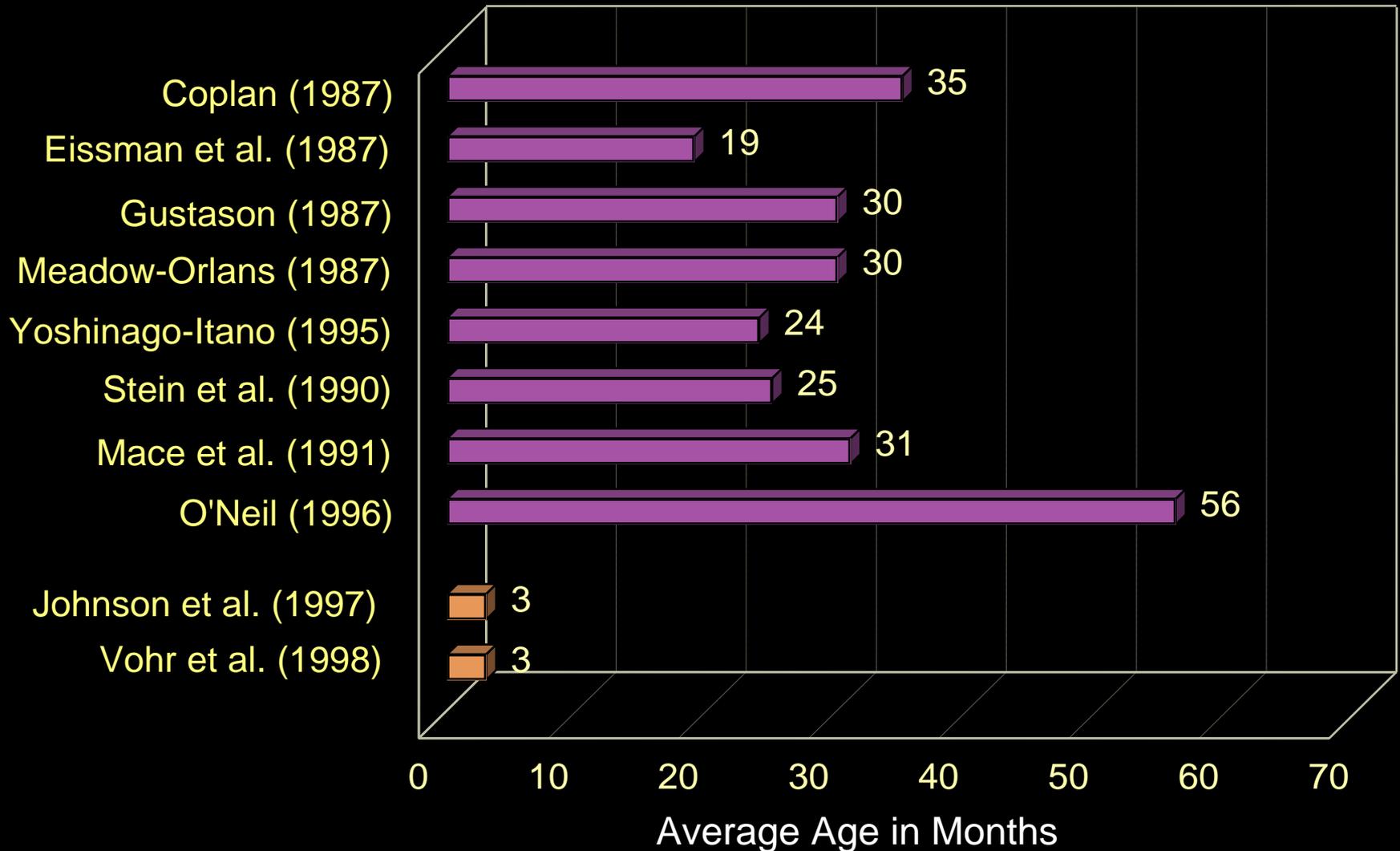


- *“The average diagnosis of hearing impairment remains constant at about 2 ½ years of age.*
- *All infants should be screened for hearing impairment...this will be accomplished most efficiently by screening prior to discharge from the well-baby nursery.*
- *Identification of hearing impairment must be seen as imperative for all infants.”*

Percentage of Newborns Screened for Hearing in the United States



Confirmation of Permanent Hearing Loss



What enabled us to move from



There



Here?

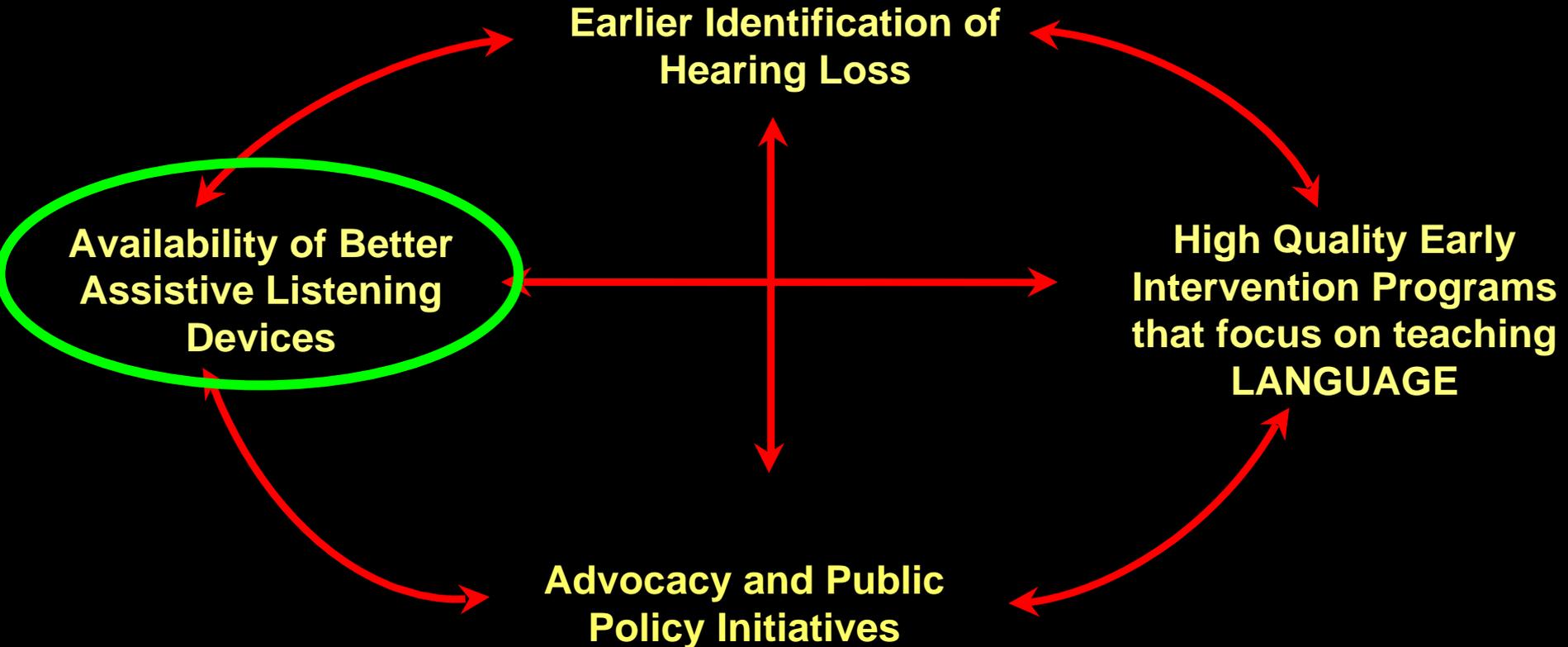


Earlier Identification of
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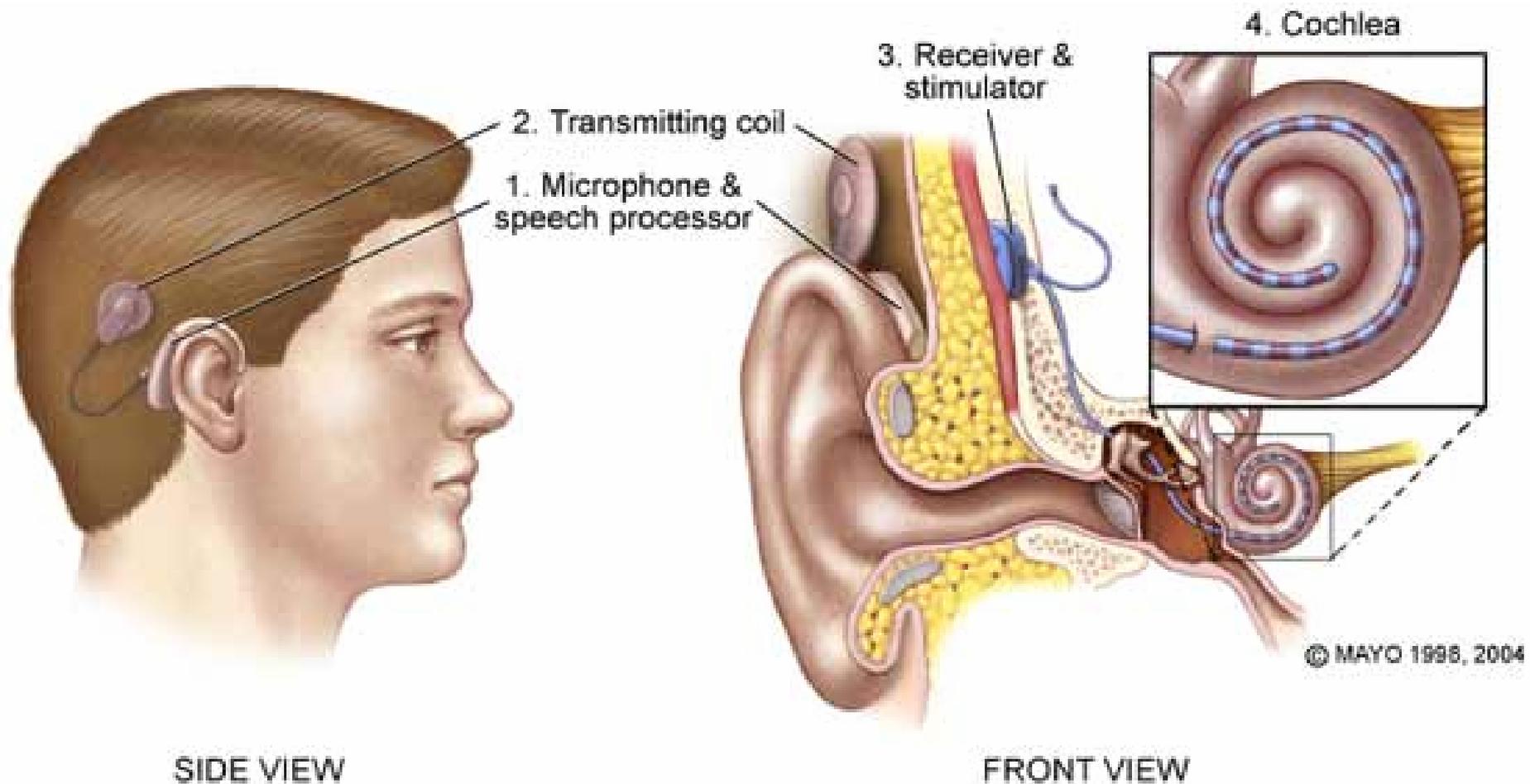
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© MAYO 1998, 2004

What enabled us to move from



There



to

Here?

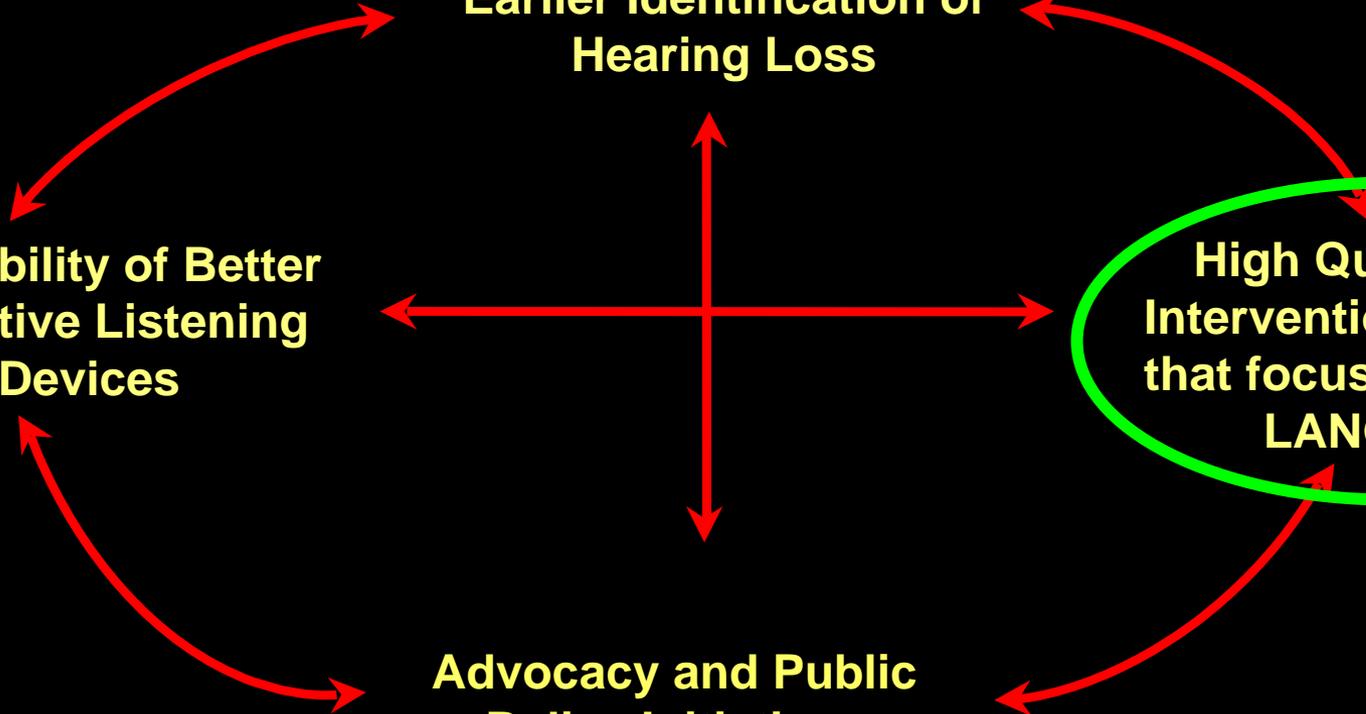


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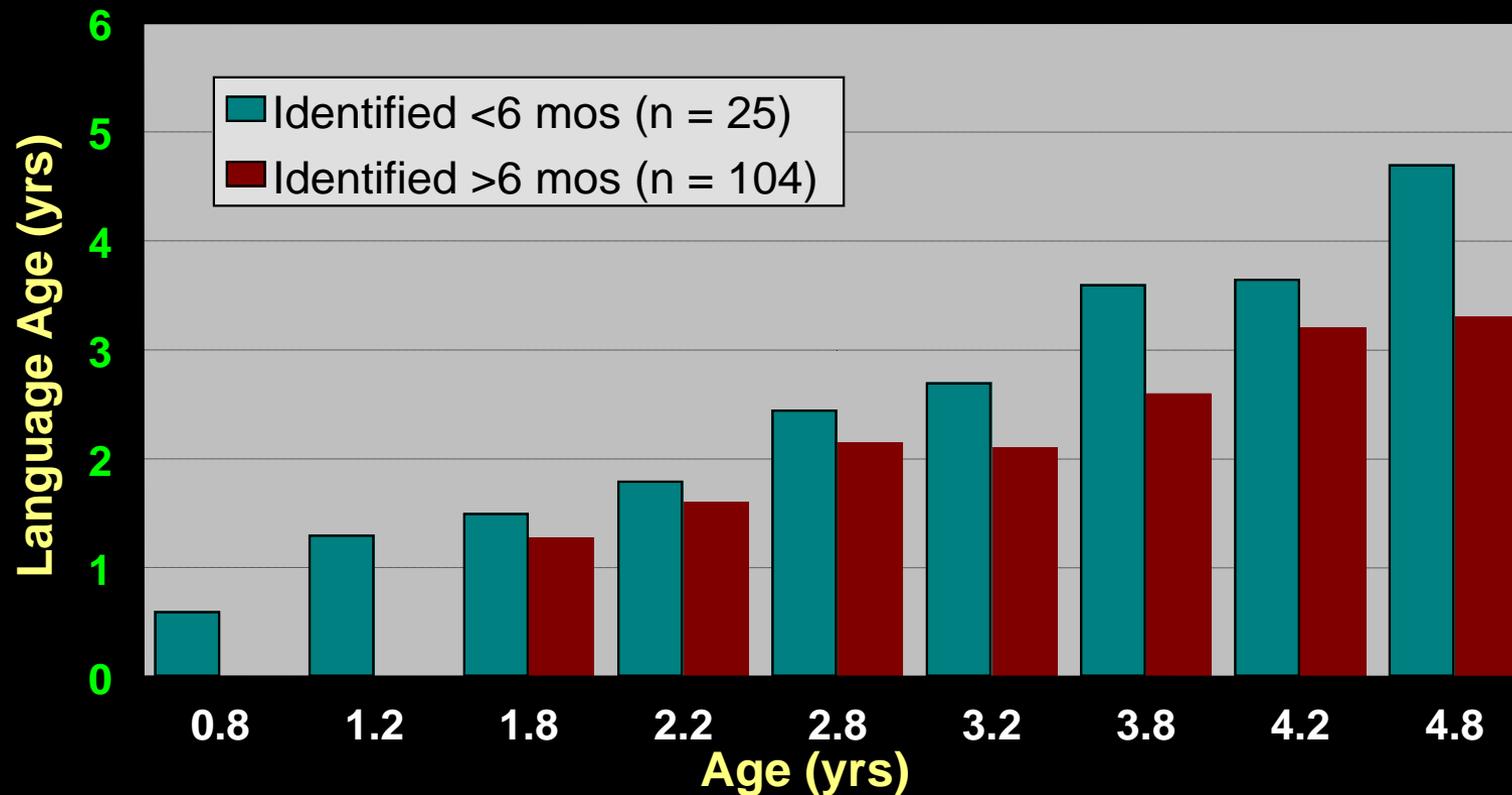
Advocacy and Public
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Boys Town National Research Hospital Study of Earlier vs. Later

129 deaf and hard-of-hearing children assessed 2x each year.

Assessments done by trained diagnostician as normal part of early intervention program.



Moeller, M.P. (1997). Personal communication moeller@boystown.org

Status of EHDI Programs in the US: Early Intervention



- **Current system designed to serve infants with bilateral severe/profound losses--- but, majority of those identified have mild, moderate, and unilateral losses**
- **State EHDI Coordinators estimate that only 53% of infants with hearing loss are enrolled in EI programs before 6 months of age**
- **28% of parents of children who are DHH report that they had to move to a new location to receive the services they wanted for their child**

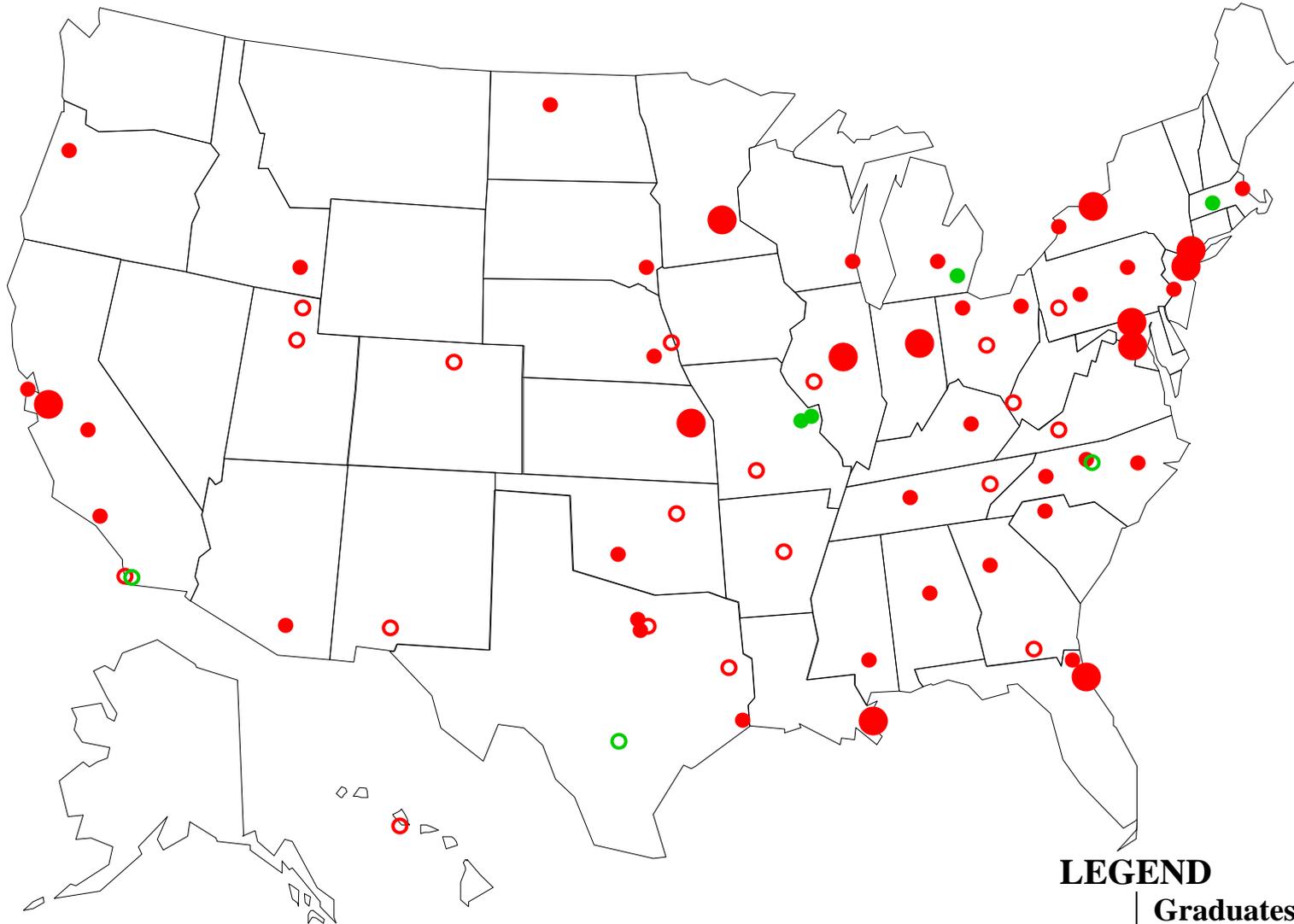
Most Early Intervention Programs for Children with Hearing Loss are "Missing the Mark"

- 95% of all newborns with hearing loss have parents with normal hearing.
- When parents in North Carolina were given a choice
 - In 1995:** 60% chose sign-language options; 40% chose auditory-oral
 - In 2005:** 15% chose sign-language options; 85% chose auditory-oral
- The number of cochlear implants for children under age 5 has quadrupled in the last 4 years (to 2000+ implants per year)

Mitchell RE and Karchmer MA. Chasing the mythical ten percent: Parental hearing status of Deaf and Hard of Hearing students in the United States. *Sign Language Studies*. 2004; 4(2), 138-163.

Brown C. Early intervention: *Strategies for public and private sector collaboration*. Paper presented at the 2006 Convention of the Alexander Graham Bell Association for the Deaf and Hard of Hearing, 2006 Pittsburgh PA.

Primary Emphasis of Personnel Preparation Programs for Teachers of Deaf and Hard of Hearing



LEGEND

Primary Emphasis	Graduates per Year:		
	1-5	6-15	16+
Sign Language-based	○	●	●
Spoken Language-based	○	●	●

Note: Although many programs describe themselves as providing “comprehensive” services, most have a primary emphasis on a specific approach as indicated by the curriculum offerings, the placement of graduates, the type of practicum available, etc. Classification of programs on this map considered those factors in conjunction with annual self-report survey data from the 2004 and 2005 issues of the *American Annals of the Deaf*.

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Advocacy, Education & Public Awareness



Training and Technical Assistance



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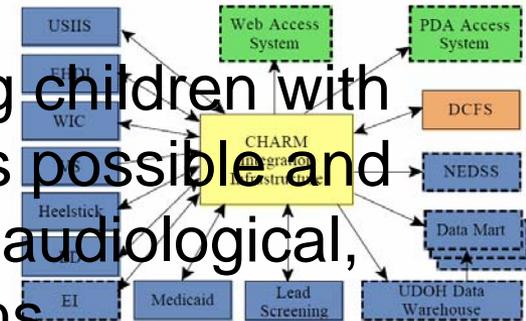
...to ensure that all infants and young children with hearing loss are identified as early as possible and provided with timely and appropriate audiological, medical, and educational interventions.

Basic Research

Detecting mutations on biosensor silicon chips



Public Health Information Management



NCHAM's Annual extramural funding: ~\$2.5 million

- **Funding sources:**

- 68% Federal agencies (e.g., CDC, MCHB, NIH, ACF),
- 25% State Departments of Health or Education,
- 7% Private foundations

- **Multi-disciplinary staff of 40 people from:**

- Psychology
- Computer science
- Audiology
- Special education
- Instructional technology
- Health education

Oberketter is considering a project with NCHAM to:

- Conduct and disseminate results of **applied research, needs assessment, and program evaluation studies** to guide policy and programmatic decisions regarding gaps in services, effectiveness of alternative models, needs of families, and allocation of training resources;
- Work with existing **pre-service and in-service professional training programs** to establish state-of-the-art curricula, promote collaboration, and recruit people to serve children who are deaf or hard of hearing;
- Coordinate with state agencies and professional organizations to up-grade and **strengthen certification and/or credentialing requirements** for professionals and programs specializing in early intervention for children who are deaf or hard of hearing;
- **Collaboratively establish and promote the best practices for educating children** who are deaf or hard of hearing and respond to gaps in services by working with state education agencies, state EHDI coordinators, Part-C administrators and others to develop and implement effective models for the delivery of services to children who are deaf or hard of hearing; and
- **Provide information and resources for parents and professionals** including printed materials, internet-based resources, professional speakers, seminars, videos, and CDs.

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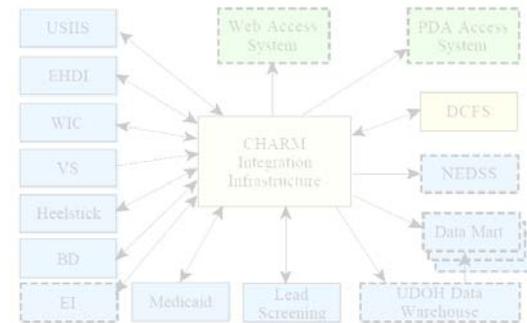


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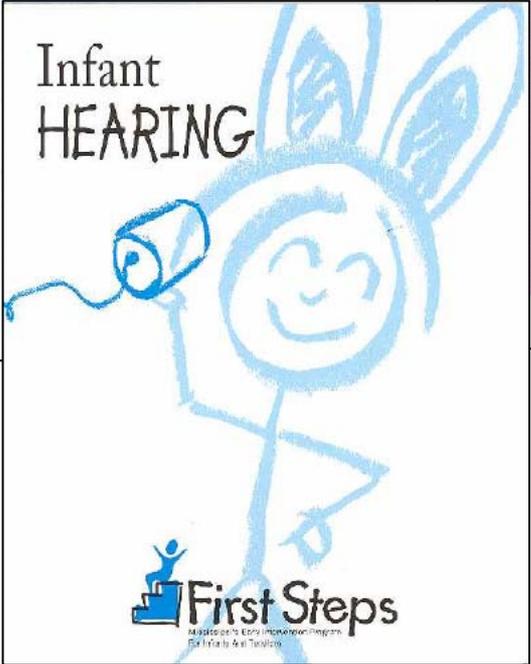
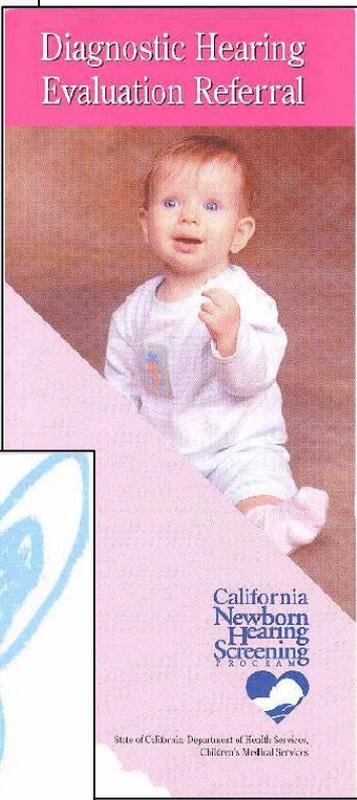
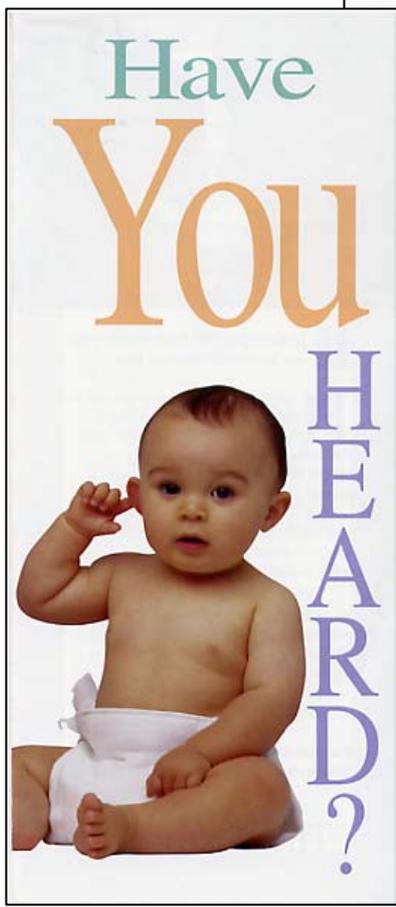


Since 1996 NCHAM has been funded by the federal government as the

National Resource Center for EHDI Programs (EHDI=Early Hearing Detection and Intervention)

- Provide training, technical assistance, and information to EHDI programs in every state
- Collaborate with professional and advocacy groups (e.g., American Academy of Pediatrics, March of Dimes) to promote effective screening and identification of hearing loss
- Webcasts, working meetings, information dissemination
- National Network of EHDI Experts

Are current EHDI materials effective?



**Distance Education/Hands-on
Audiology Training Workshops**

**Investing in Family Support
Working Meeting**

**Meeting of Part C Coordinators at 2006
National EHDI Meeting**

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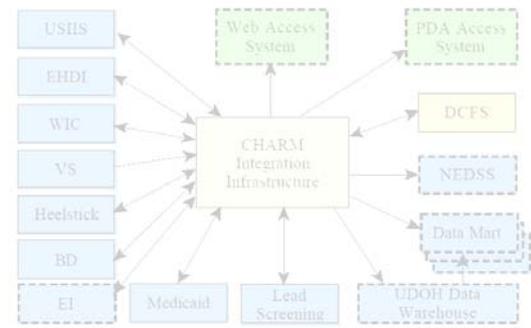


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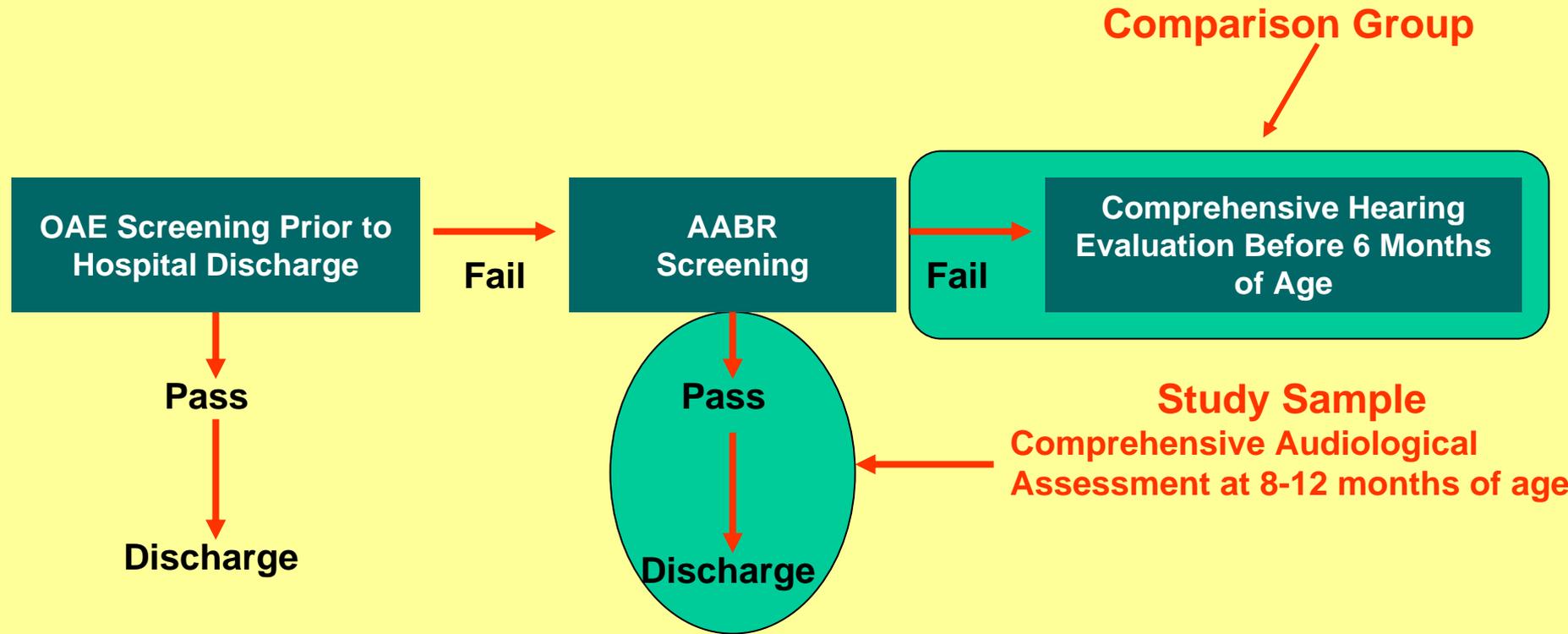


The Hearing Head Start Project

- Feasibility study from 2001-2004
- 69 programs in 3 states with 3,000+ children screened
- Identified 2 per 1,000 with permanent hearing loss and 20 per 1,000 with unidentified transient losses
- Programs now being replicated in 12 additional states



Does a 2-stage (OAE/AABR) newborn hearing screening protocol miss babies with mild hearing loss?



How Many Additional Babies with Permanent Hearing Loss were Identified?

	Comparison Group (Fail OAE/ Fail AABR)	Study Group (Fail OAE/ Pass AABR)	Total
Number of Babies	158	21	179
Prevalence per 1,000	1.82	.55*	2.37

*Adjusted for proportion of OAE fails that enrolled

Represents 23%
of all babies with
PHL in birth
cohort

Costs of Newborn Hearing Screening in Utah



**Linda D. Goetze, Kay W. Hansen, Karl R. White,
and Scott Grosse**

Early Intervention Research Institute
Utah State University
Logan, UT 84322-6580
www.eiri.usu.edu
Linda.Goetze@usu.edu

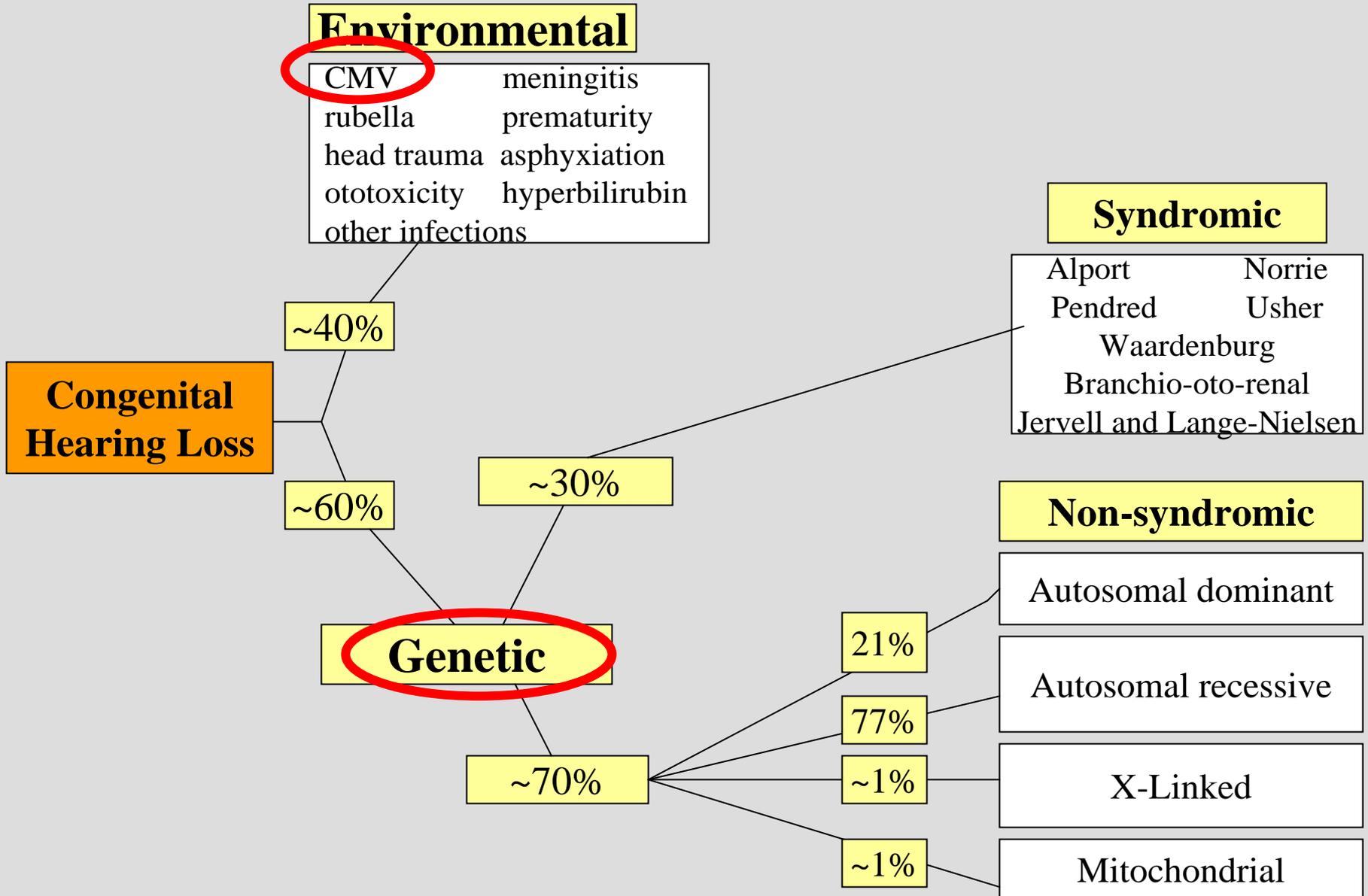
Presented at:

**National Early Hearing Detection and Intervention Conference
Washington, DC**

February 20, 2004



What Causes Hearing Loss?



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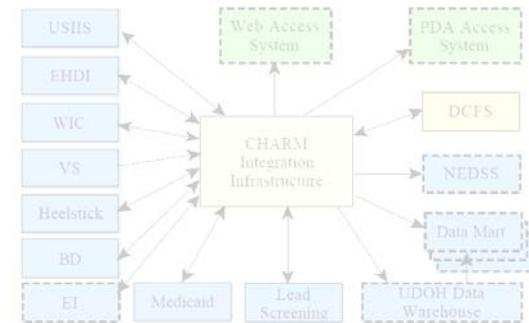


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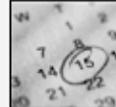
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SEARCH WEB SITE



[Bulletin Board](#)



[Upcoming Events](#)



[Links & Links](#)

NAVIGATION

Who We Are

- [Our Background](#)
- [Nat. ELDI Resource Center](#)
- [Research Projects](#)
- [The Staff](#)

EHDI Components

- [Newborn Hearing Screening](#)
- [Diagnostic Audiology](#)



• 2006 SE Regional ELDI Conference •

Registration is open for the Southeast Regional ELDI Conference: Partnering for Progress to held on October 5-7, 2006 in Jackson, Mississippi
[Click for more information](#)

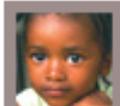
 To ensure that all infants and toddlers with hearing loss are identified as early as possible and provided with timely and appropriate audiological, educational, and medical intervention, an early hearing detection and intervention (EHDI) program should comprise three basic components—[newborn hearing screening](#), [audiological diagnosis](#), and [early intervention](#). Threaded throughout these components should also be some key elements—[culturally-competent family support](#), [medical home](#), [data management](#), [legislative mandates](#), and [program evaluation tools](#). Follow the links below to find information about these [basic components](#) and key elements, and about [other related EHDI resources and information](#).

 <p>EHDI Components</p>	 <p>EHDI Resources</p>	 <p>State Information</p>	 <p>Legislative Activities</p>	 <p>NCHAM Items</p>	 <p>Annual EHDI Meetings</p>	 <p>EHDI Workshops</p>
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hear and
now .ORG

can you hear me?

i can't hear you.



Help your child hear. And now.

Parents

Health Care Providers

Resources

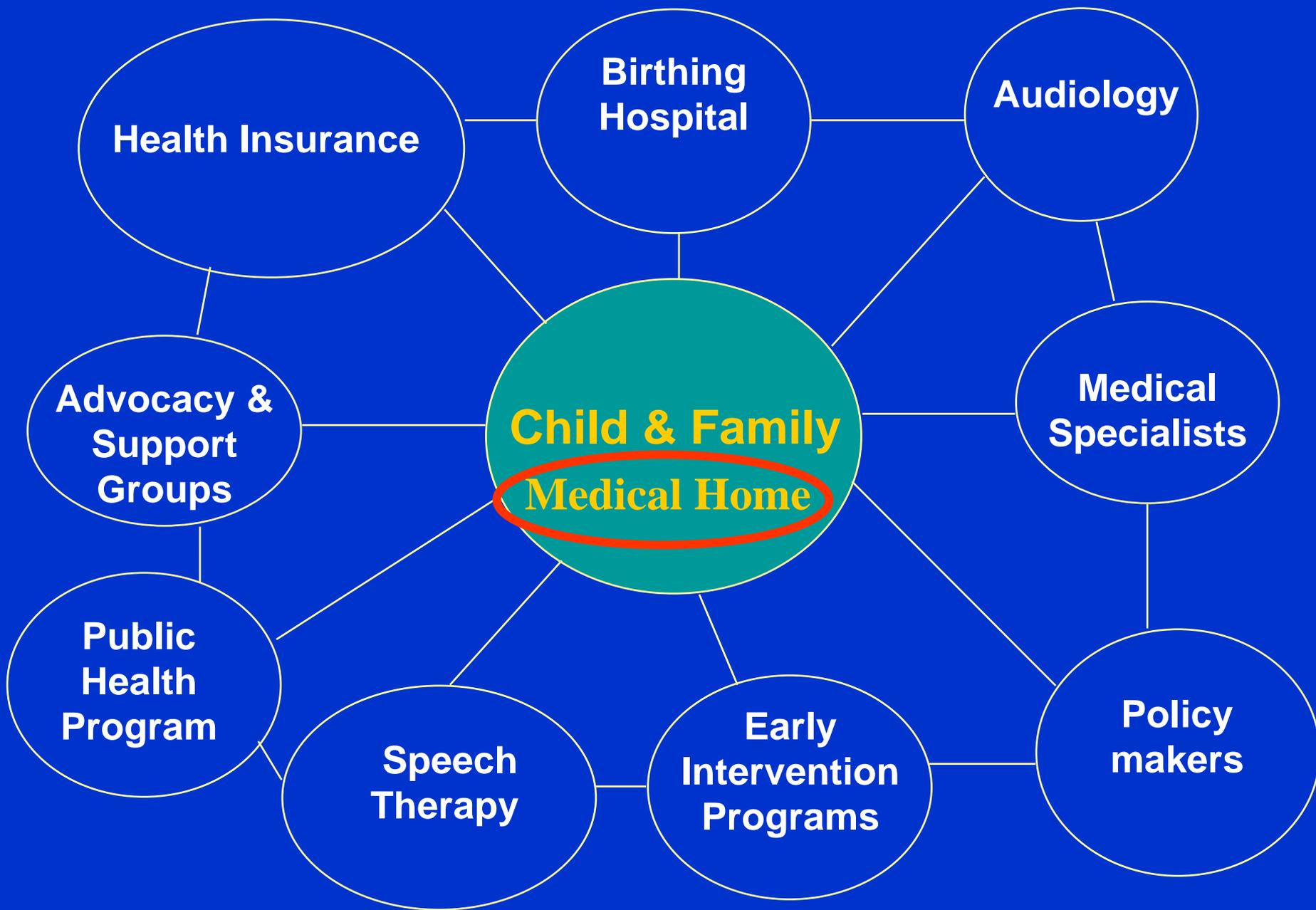
About Us

Parents

Many people are surprised to learn that 12,000 babies a year in the U.S. are born with a permanent hearing loss. That makes hearing loss the most common birth defect. It also means that about 1 out of every 300 babies will need special help to hear and speak. This is why hospitals now screen (test) the hearing of most newborns. When a hearing loss is found early, parents and professionals can work together to help a child develop normally. If you have questions or concerns about your child's hearing, don't wait and see--help your child.

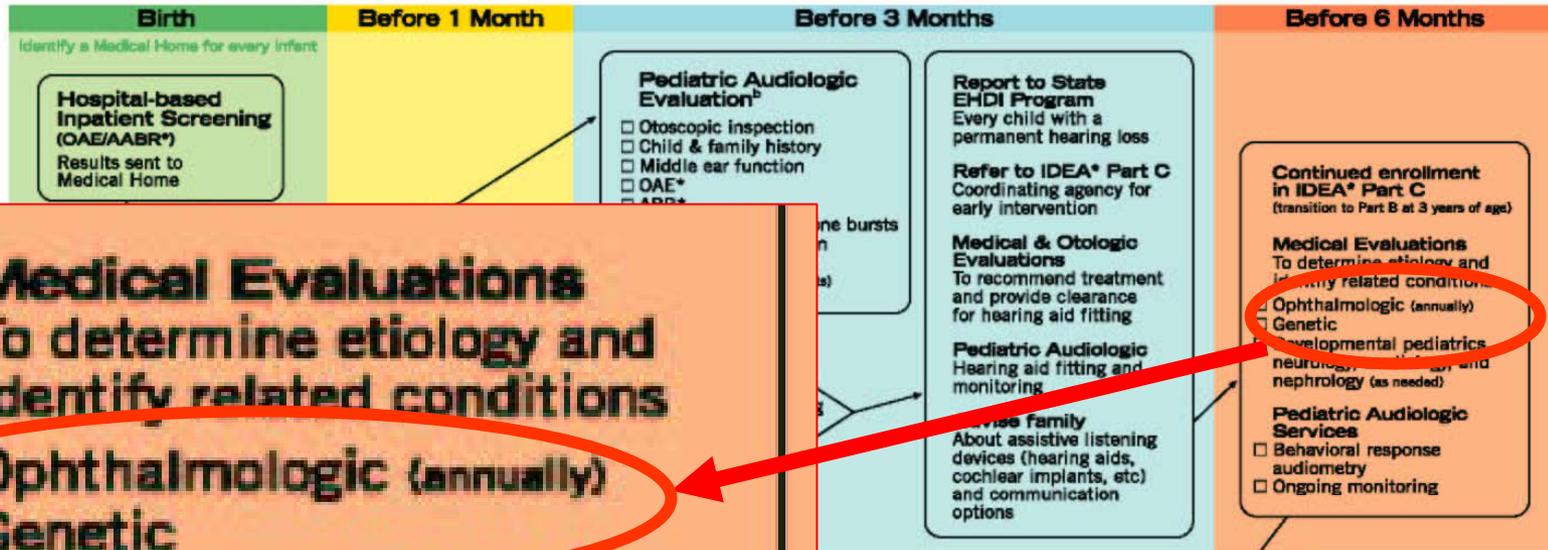
- ◆ What do I do if my baby failed a hearing screening test?
- ◆ Was my baby's hearing screened?
- ◆ I am worried my child doesn't hear well.
- ◆ Why is hearing so important for children?

Partnership is the Key to Successful EDHI Programs



American Academy of Pediatrics

Universal Newborn Hearing Screening, Diagnosis, and Intervention Guidelines for Pediatric Medical Home Providers



Medical Evaluations To determine etiology and identify related conditions

- Ophthalmologic (annually)
- Genetic
- Developmental pediatrics, neurology, cardiology, and nephrology (as needed)

Pediatric Audiologic Services

- Behavioral response audiometry
- Ongoing monitoring

*OAE = Otoacoustic Emissions, AABR = Automated Auditory Brainstem Response, ABR = Auditory Brainstem Response, IDEA = Individuals with Disabilities Education Act

Notes:

(a) In screening programs that do not provide Outpatient Screening, infants will be referred directly from Inpatient Screening to Pediatric Audiologic Evaluation. Likewise, infants at higher risk for hearing loss, or loss to follow-up, also may be referred directly to Pediatric Audiologic Evaluation.

(b) Part C of IDEA* may provide diagnostic audiological evaluation services as part of Child Find activities.

(c) Infants who fail the screening in one or both ears should be referred for further screening or Pediatric Audiologic Evaluation.

(d) Includes infants whose parents refused initial or follow-up hearing screening.

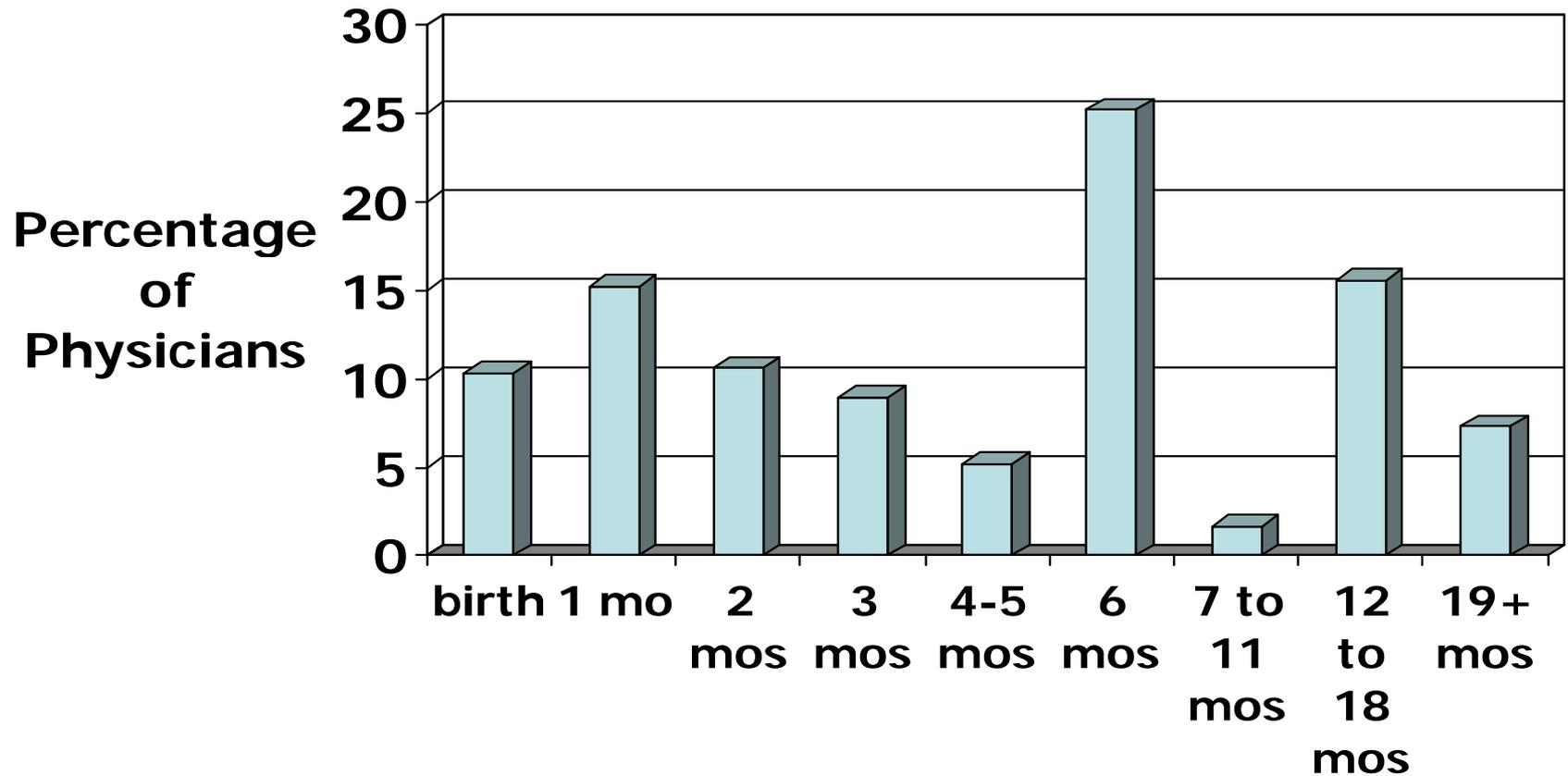
Educating Primary Health Care Providers About Early Identification of Hearing Loss

Assume a newborn for whom you are caring is diagnosed with a moderate to profound bilateral hearing loss. If no other indications are present, to which specialists would you refer the baby?:

	Always or Often
Ophthalmological evaluation	0.6%
Genetic evaluation	8.9%
Otolaryngological evaluation	75.6%

Responses of 1975 physicians in 21 states

When can an infant be fit with hearing aids?



Type of Physician	Age at which hearing aids can be fit				
	<=1 mo	2-3 mos	4-6 mos	7-11 mos	12+ mos
Pediatrician (n=1145)	36.3%	16.9%	29.0%	2.1%	15.6%

Hearing Screening During Well Child Visits to Health Care Providers

Early Identification of Hearing Loss



Conducting periodic Otoacoustic Emissions (OAE) hearing screening with infants and toddlers during well-child visits



Helping Children Hear... and Now

NCHAM
National Center for Hearing Assessment and Management
Utah State University


OTICON FONDEN

- Pilot studies and materials development 2005-2006
- Worked with American Academy of Pediatrics to develop recommended policy changes
- Development of training and implementation materials funded by Oticon foundation

Materials available from
www.HearAndNow.org

Policy and Legislative Initiatives with Local, State and Federal Partners





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Advocacy, Education & Public Awareness



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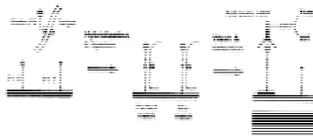


International Outreach

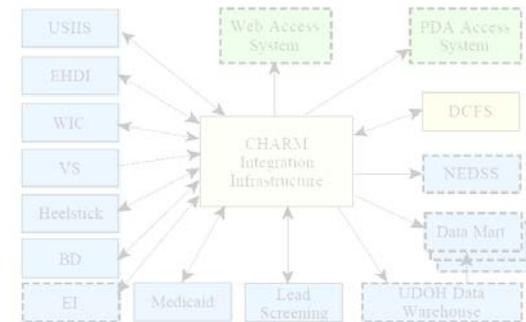


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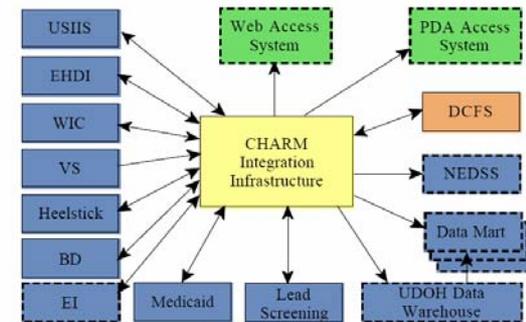


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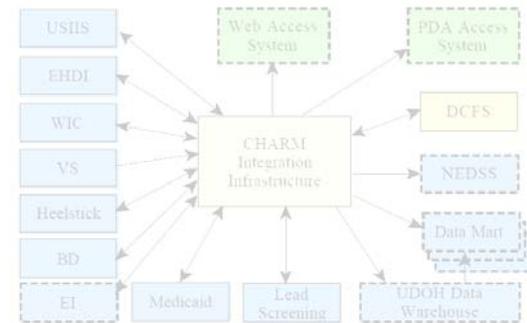


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Public Health Information Management





Poland



Malaysia



India



Costa Rica

Ah, but a man's reach should exceed
his grasp. Or what's a heaven for?

---- Robert Browning





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