

# **Early Hearing Detection and Intervention (EHDI) for Children Who are Deaf or Hard of Hearing**



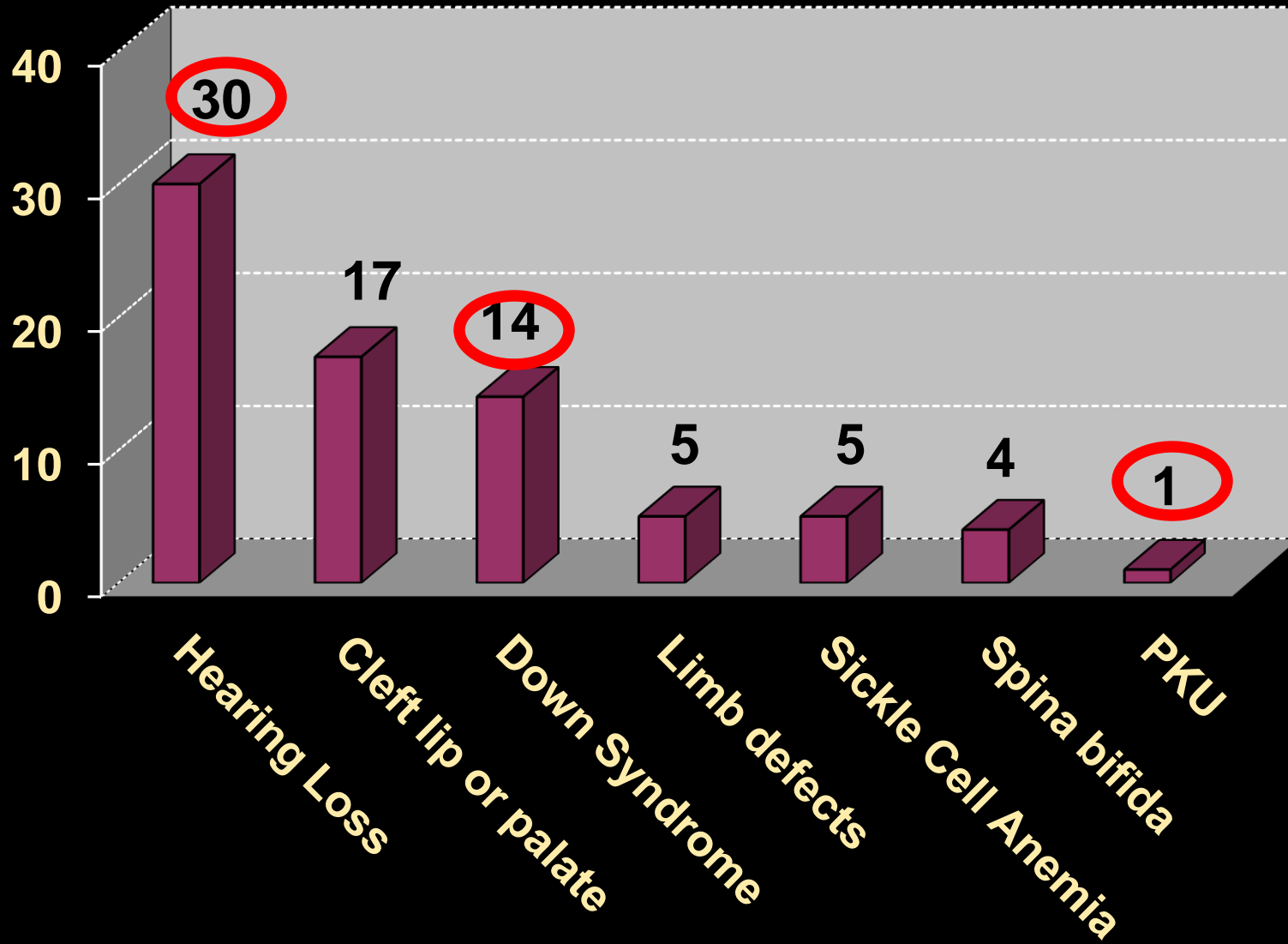
**Karl R. White**

**National Center for Hearing Assessment and Management**

**[www.infanthearing.org](http://www.infanthearing.org)**

# Permanent hearing loss occurs more frequently than any other condition for which we can screen at birth

Incidence per 10,000 of Congenital Conditions



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

--- Helen Keller



Total  
Communication

Cued  
Speech

Sign  
Language

Listening  
& Spoken  
Language



Visual  
Language

Spoken  
Language






MONTREAL ORAL  
SCHOOL  
GROUP - 4  
200-4 1977-78



Audio and picture courtesy of Susan Nittrouer, Ohio State University



A young girl with blonde hair, wearing a pink shirt, is holding a book. In the background, another child is visible, and there are bookshelves with books. The scene is set in a library or classroom.

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









# What enabled us to move from ...



There



to

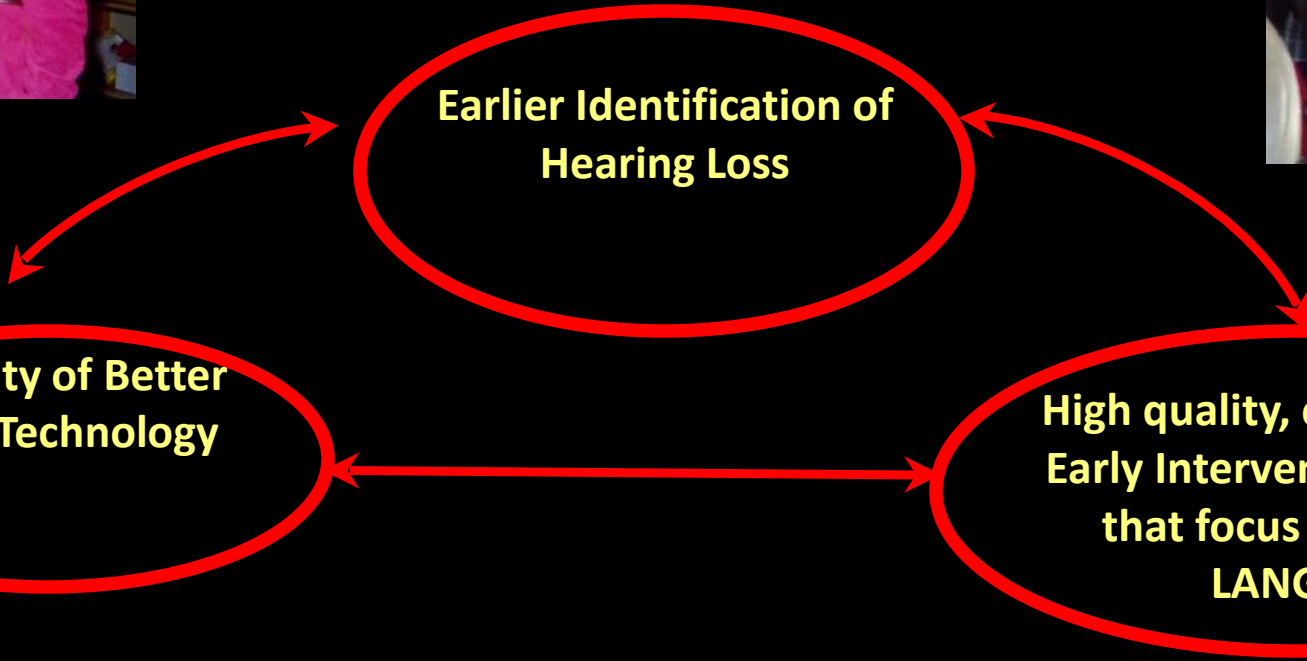
Here?



Earlier Identification of  
Hearing Loss

Availability of Better  
Hearing Technology

High quality, comprehensive  
Early Intervention programs  
that focus on teaching  
LANGUAGE



# 1988-1993

## Rhode Island Hearing Assessment Project

(first large-scale evaluation of universal newborn hearing screening)

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

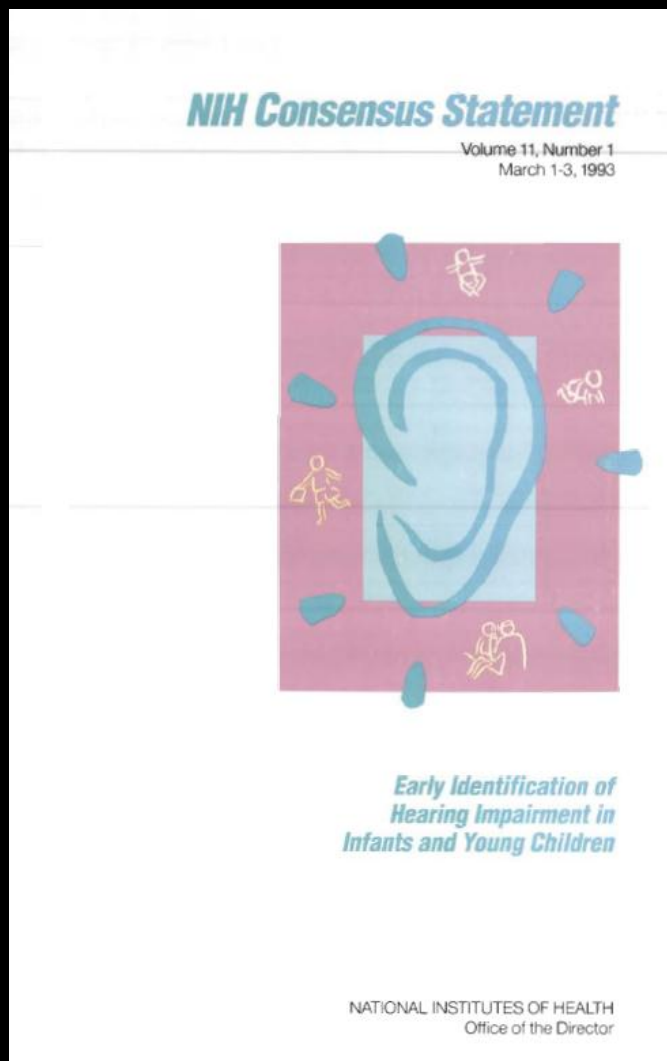
*Karl R. White, Ph.D., Betty R. Vohr, M.D., and Thomas R. Behrens, Ph.D.*

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.<sup>1</sup> 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.<sup>2</sup>

In spite of the acknowledged importance of identifying hearing loss as soon after birth as possible, the average age of identification in the United States is 24 to 30 months

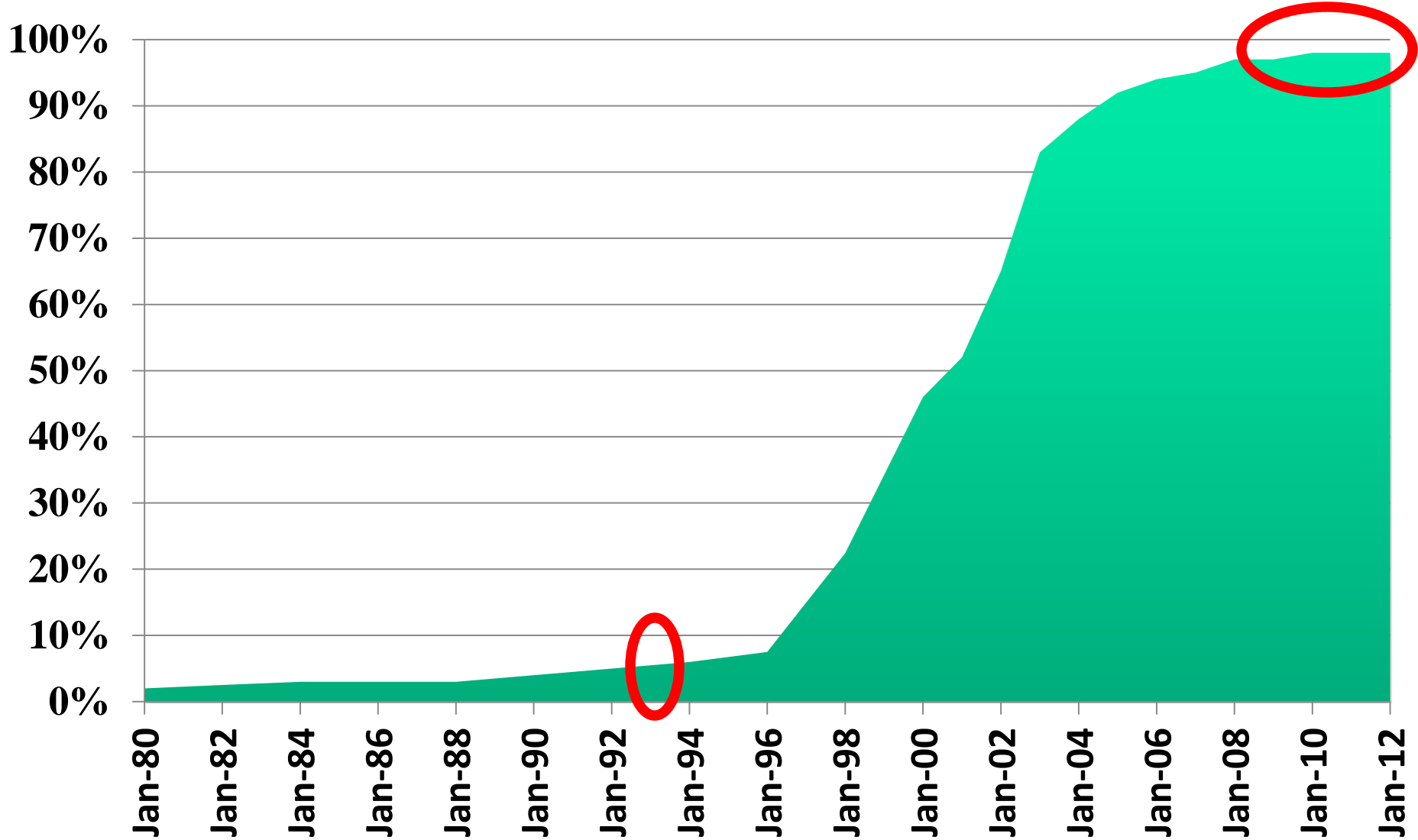
of using auditory brainstem response (ABR) to identify hearing loss among infants and toddlers.<sup>4,5</sup> Such research certainly contributed substantially to the American Speech-Hearing Language Association's (ASHA) recommendation of ABR as the preferred method for screening the hearing of newborns.<sup>6</sup> 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 factors identified by the Joint Committee on Infant Hearing.<sup>7</sup> Unfortunately, recent research has demonstrated that as many as half of all children with bilateral severe-to-

# In March, 1993 an NIH Consensus Panel concluded that:



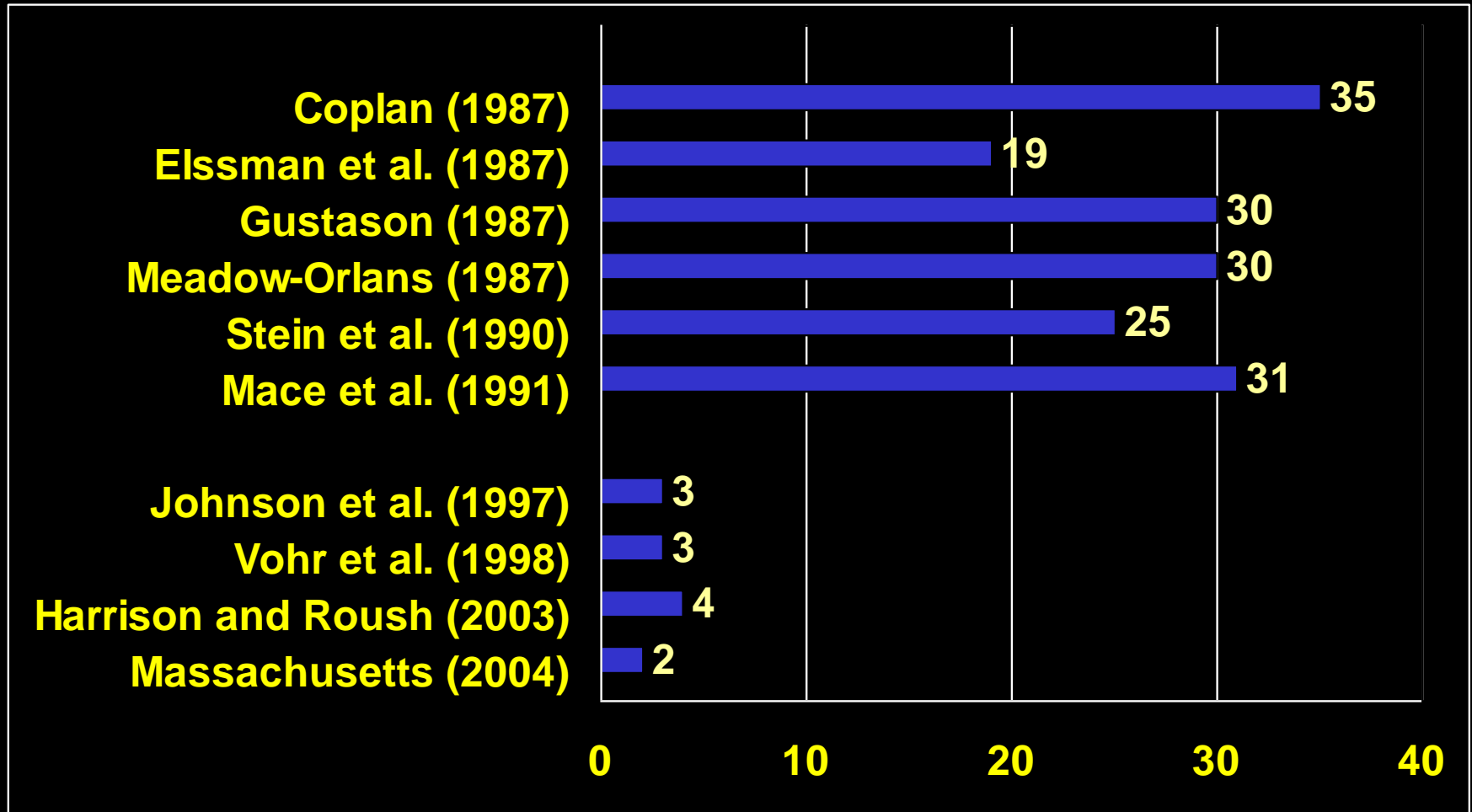
- The average age of diagnosis of hearing loss remains constant at about 2 ½ years of age.
- All infants should be screened for hearing loss...this will be accomplished most efficiently by screening prior to discharge from the well-baby nursery.
- Identification of hearing loss must be seen as imperative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

# Percentage of Newborns Screened for Hearing in the United States



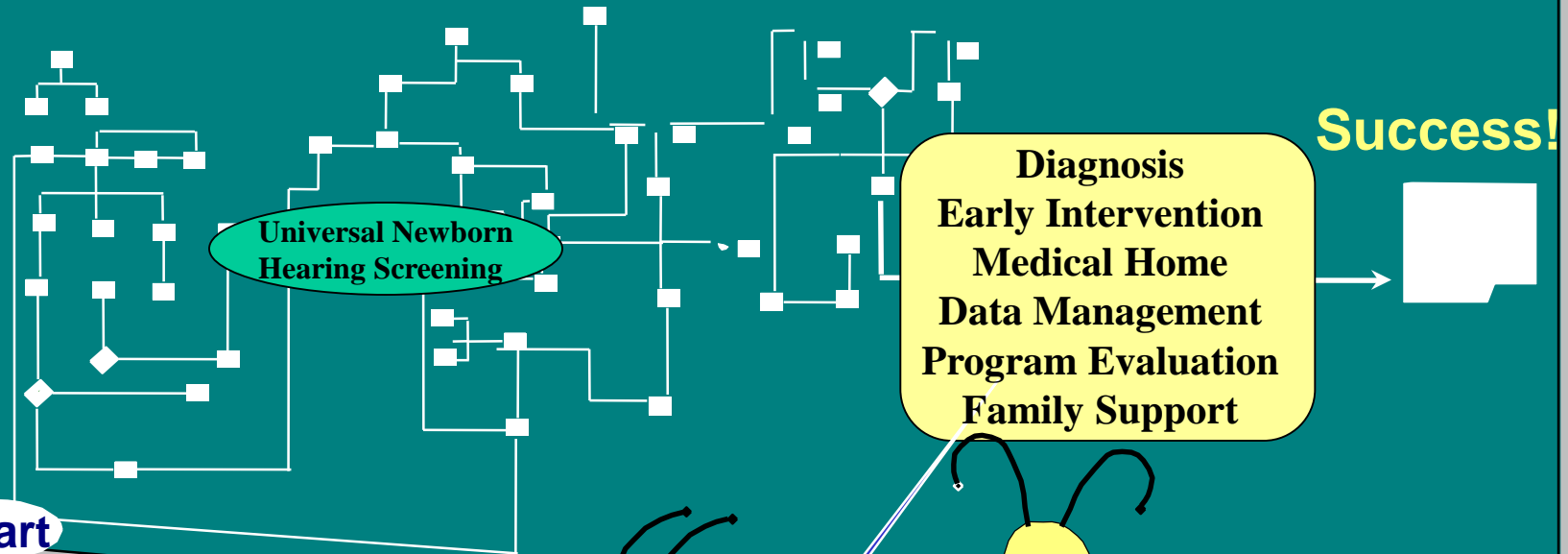


# Age in Months at Which Permanent Hearing Loss Was Diagnosed



White KR, Forsman I, Eichwald J, Munoz K (2010). The evolution of early hearing detection and intervention programs in the United States. *Semin Perinatol.* 34(2):170-9.

# Effective EHDI (Early Hearing Detection and Intervention) Programs



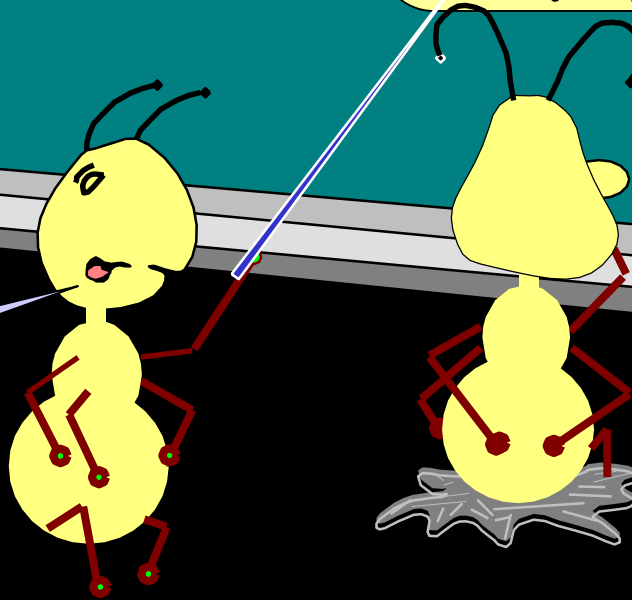
Start

Universal Newborn  
Hearing Screening

Diagnosis  
Early Intervention  
Medical Home  
Data Management  
Program Evaluation  
Family Support

Success!

Good work, but I think we might need a little more detail right here





# 1

## Hearing Screening for Young Children

### 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
- Currently in 46 of 50 states





# National Sample of 2,000+ Physicians Who Care for Children

Do you ever do hearing screening for  
infants and young children in your office?

Yes – 30.2%

No – 69.8%

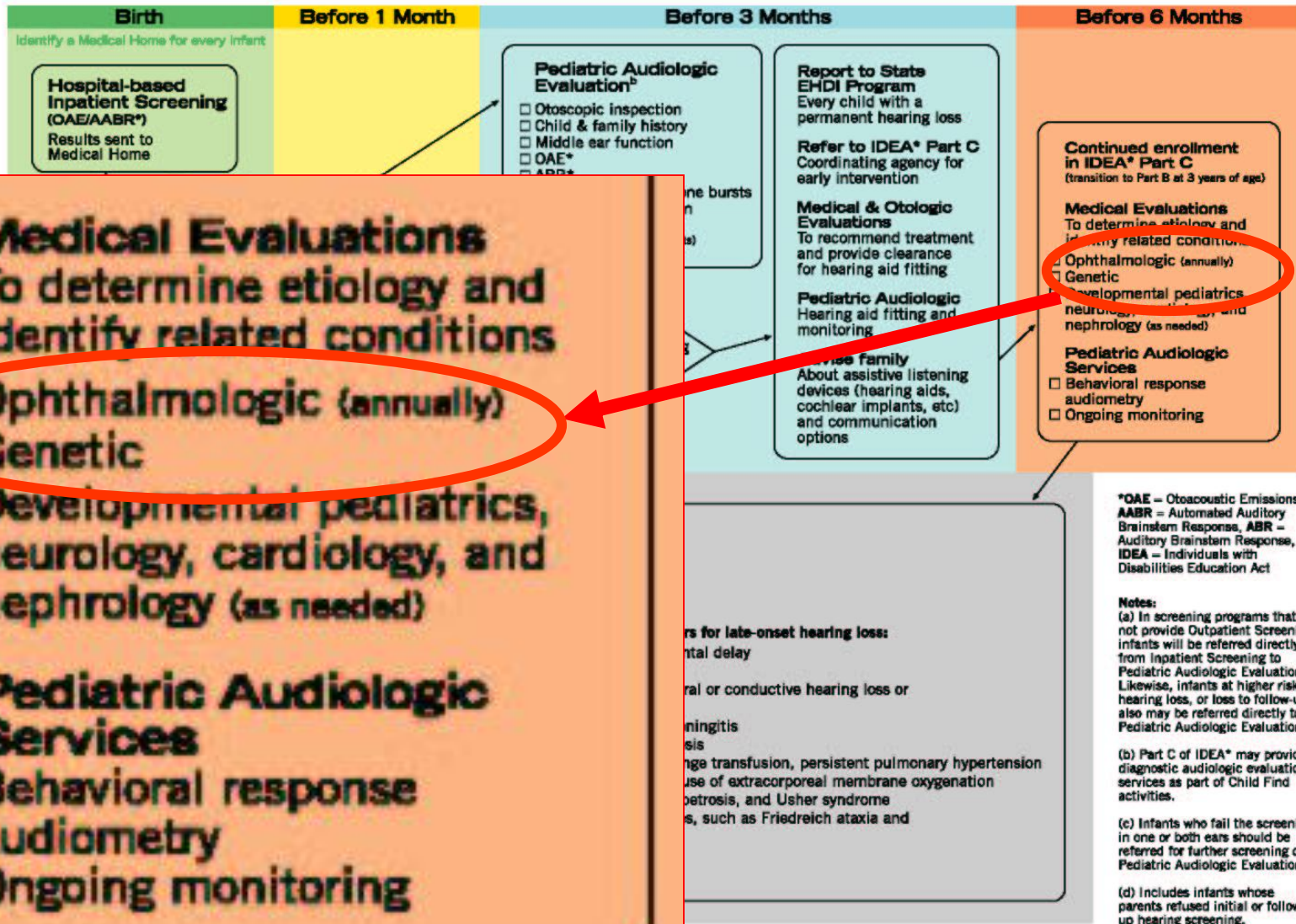


## How often do you use each of the following to screen hearing in your office?

	Never	Occasionally	Frequently	Always
a. AABR	<b>71.1%</b>	<b>16.2%</b>	<b>9.0%</b>	<b>3.7%</b>
b. Response to sounds/noisemakers	<b>16.7%</b>	<b>24.2%</b>	<b>36.6%</b>	<b>22.5%</b>
c. Caregiver interview or questionnaire	<b>8.7%</b>	<b>11.7%</b>	<b>35.2%</b>	<b>44.2%</b>
d. OAE	<b>34.1%</b>	<b>14.7%</b>	<b>27.9%</b>	<b>23.3%</b>
e. Tuning Fork	<b>55.1%</b>	<b>32.5%</b>	<b>8.4%</b>	<b>4.1%</b>
f. Tympanometry	<b>21.5%</b>	<b>28.0%</b>	<b>30.7%</b>	<b>19.8%</b>
g. Other (describe)	<b>25.0%</b>	<b>14.8%</b>	<b>36.4%</b>	<b>22.7%</b>

# American Academy of Pediatrics

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



# Educating Primary Health Care Providers About Early Identification of Hearing Loss

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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?:

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

---

2005

Responses of 1,975 physicians in 21 states

Moeller MP, White KR, & Shisler L (2006). Primary care physicians' knowledge, attitudes and practices related to newborn hearing screening. *Pediatrics*. 118, 1357-1370.



# What is your best estimate of the earliest age at which:

<1 mo	1-3 mos	4-6 mos	7-9 mos	10-12 mos	>12 mo
51.9%	10.8%	12.4%	15.3%	0.3%	9.3%
20.5%	36.8%	26.1%	2.1%	9.9%	4.8%
38.3%	9.0%	11.2%	12.2%	12.2%	18.1%
12.6%	27.7%	31.4%	47.3%	8.6%	8.6%
61.6%	8.0%	13.1%	0.4%	7.0%	7.0%
23.2%	34.1%	39.9%	7.8%	3.4%	3.4%

b. A child can be definitively diagnosed as having a permanent hearing loss

c. A child can begin wearing hearing aids

d. A child with permanent hearing loss should be referred to early intervention services

2005/2012



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## Networking



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## EHDI-Related Videos



Navigating Deafness in a Hearing World



Jeanne Hollabaugh Parent Communication



Communicate With Your Child Using ASL



Rachel Coleman: One Deaf Child

• [Archive of EHDI-Related Videos](#)

## Diagnostic Audiology

**Diagnostic Audiology for Audiologists:** This workshop was filmed during the Diagnostics and Amplification for Infants and Toddlers workshop on June 6th & 7th, 2012 in Meridian, Idaho, and is now available online for AAA CEUs.

(((NCHAM serves as the **National Resource Center** for the implementation and improvement of comprehensive and effective Early Hearing Detection and Intervention (EHDI) systems. As a multidisciplinary Center, our goal is 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.

## EHDI News and RSS

- [Pediatric Hearing Health: Today and Tomorrow](#) September 12, 2013
- [CMV can Lead to Hearing Loss](#) September 11, 2013
- [Vanderbilt's Telemedicine Initiative Conducts Followup Hearing Tests on Newborns in Rural Areas](#) September 9, 2013
- [Public Health Planning for Hearing Impairment—Short Course Scheduled in South Africa](#) September 4, 2013
- [The September edition of Probes and Tips is now available: New Resources for Finding a Pediatric Audiologist](#) September 3, 2013
- [How do families and healthcare providers find your state EHDI website?](#) August 29, 2013
- [Study Identifies Molecular Process Behind Form of Non Syndromic Deafness](#) August 28, 2013
- [More News...](#)

*Disclaimer*

## EHDI Components

- Newborn Hearing Screening
- Early Childhood Hearing Screening
- Diagnostic Audiology
- Early Intervention
- Family Support
- Medical Home
- Data Management
- Financing & Reimbursements
- Program Evaluation



## EHDI/UNHS Resources

- Newborn Hearing Screening Training Curriculum
- Addressing Privacy Regulations
- Position Statements
- EHDI/UNHS FAQ
- Slideshow Presentations
- Educational and Training Videos
- NCHAM Materials
- EHDI Implementation in Latin America
- EHDI E-Book
- Telehealth
- Tele-intervention Resource Guide
- EHDI Web Resource Guide



## State EHDI Information

## EHDI Legislation