



# **EARLY HEARING DETECTION AND INTERVENTION (EHDI) OUTCOMES FROM RESEARCH AND IMPLICATIONS FOR GEIS**

**A Workshop for the  
Guam Early Intervention System**

**by**

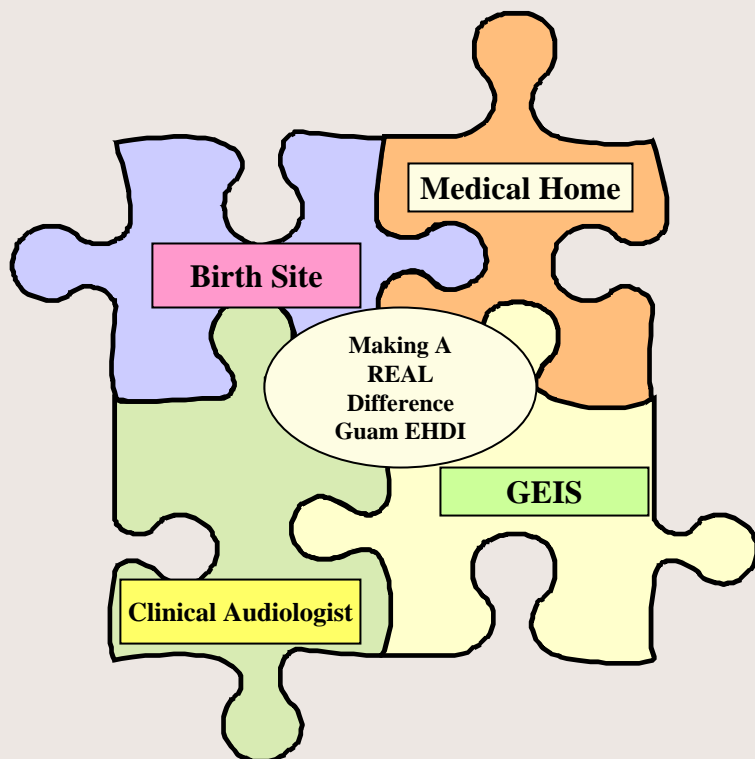
**Dr. Velma Sablan, Project Director for  
Guam EHDI Tracking & Surveillance**

**Feb. 1, 2006-1:30-3:30pm**

**GSAT Classroom**

# Purpose of the Workshop

*Review after administering the Pre-test*



1. To provide Early Intervention Service Providers (EISPs) with research information on the outcomes of infants identified with hearing loss and were provided with early intervention services
2. To underscore the importance of early follow up and the development of the IFSP for infants with hearing loss
3. To brainstorm ideas to support families in returning for follow up
4. To fine tune an EHDI-GEIS plan of action for follow up on infants who have been identified with hearing loss



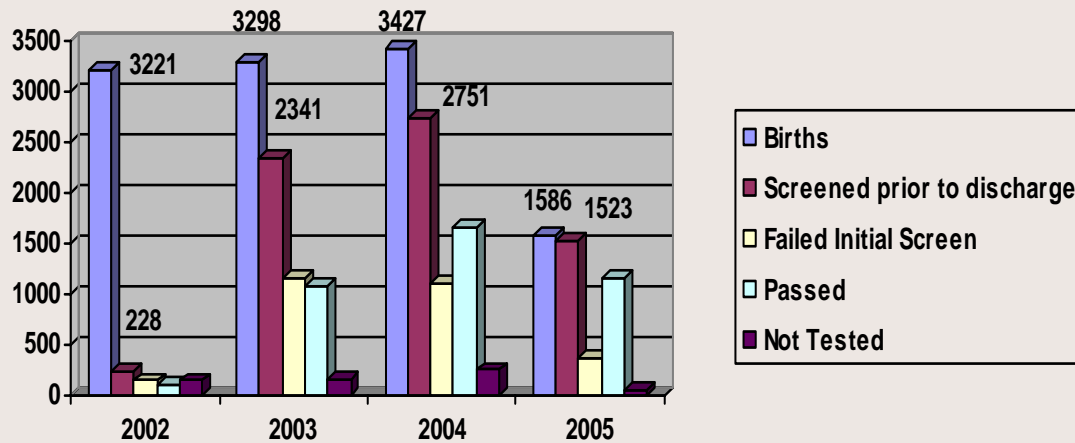


# Outcomes for Today:

At the end of the session participants....

- Can articulate the research outcomes of infants identified with hearing loss and provided early intervention services-
- Can articulate the importance of early follow up and the development of the IFSP for infants with hearing loss
- Brainstorm ideas to support families in returning for follow up
- Will provide input on the EHDI-GEIS plan of action for follow up on infants who have been identified with hearing loss and need rescreening, DAEs, or IFSPs.

# Before we look at the research, let's look at some facts on how Guam is doing in UNHS.....



- Guam began screening infants in November, 2002, screening less than 10% of infants born that year
- By 2003, Guam had screened 71% of infants
- By 2004, Guam had screened 80% of all infants born on Guam
- By 2005, Guam will be reaching over 95% of the infants born on Guam
- We have made significant progress and with the passage of Public Law 27-150, the Universal Newborn Hearing Screening and Intervention Act of 2004 which makes hearing screening part of the standard of care for all infants born on Guam
- As of February 8, 2006, a total of 9,412 have been screened from 2003-2006

# So Guam has improved screening rates, but how are we doing with follow up?

2003 Infants	DOB	Referral Date	Total Months DOB to Referral	Date of Full Diagnostic Assessment	Total Months from DOB to Assessment
IB	6-03	10-04	17 mos.	3-05	21 mos
TC	9-03	11-03	2 mos.	1-05	16 mos.
SG	2-03	6-03	4 mos.	8-03	6 mos.
MG	11-03	12-03	1 mon.	3-04	4 mos.
IP	2-03	2-05	24 mos.	5-05	27 mos.
MS	7-03	2-04	7 mos	1-05	18 mos.
JT	12-02	3-03	3 mos.	10-03	10 mos.
<b>2003 N=7</b>	<b>Range: 4 months to 27 months Average months from BIRTH to REFERRAL: 8.3 months</b>			<b>Range: 4 months to 27 months Average months from BIRTH to FULL ASSESSMENT: 14.6 months</b>	

# So Guam has improved screening rates, but how are we doing with follow up?

2004 Infants	DOB	Referral Date	Total Months DOB to Referral	Date of Full Diagnostic Assessment	Total Months from DOB to Assessment
SA	9-04	10-04	1 month	12/04	3 mos.
KB	10-04	11-04	1 month	2/05	4 mos.
SE (twin1)	7-04	1-05	6 months	3/05	8 mos
SE (twin2)	7-04	1-05	6 months	3/05	8 mos.
AE	5-04	1-05	8 months	2/05	9 mos.
RL	8-04	9-04	1 month	2/05	6 mos.
ALG (twin1)	1-04	5-04	4 months	NDA*	-----
ALG (twin2)	1-04	5-04	4 months	10/04	9 mos
CJM	7-04	8-04	1 month	3/05	8 mos.
VS	4-04	3-05	11 months	LFU**	-----
CS	7-04	12-04	5 months	3/05	8 mos.
TW	2-04	4-04	2 months	9/04	7 mos
<b>2004 N=12</b>	<b>Range: 3 months to 9 months Average no.of months from BIRTH to REFERRAL: 4.2 months</b>			<b>Range: 3 mos. To 9 months Average no. of months from BIRTH to FULL ASSESSMENT: 7 months</b>	

# Brief Discussion

## Discussion Question:



What do you think made the difference that changed the 2003 14.6 average from rescreening to DAE to 7 months in 2004, a decrease of 7.6 months  
Do we need to improve??

# And...how is Guam doing in getting infants with hearing loss into early intervention services?

**Time Lag Between DOB to IFSP for Identified Infants 2003**

<b>2003 Infants N=7</b>	<b>DOB</b>	<b>Date of IFSP</b>	<b>Total Months from DOB to IFSP</b>
IB	6-03	4-05	23 months
TC	9-03	3-05	18 months
SG	2-03	6-05	28 months
MG	11-03	2-05	15 months
IP	2-03	6-05	28 months
MS	7-03	6-05	23 months
JT	12-02	3-05	27 months
<b>Range: 15 months to 28 months</b> <b>Average Months from DOB to IFSP in 2003:</b> <b>23.1 Months</b>			



# And...how is Guam doing in getting infants with hearing loss into early intervention services?

## Time Lag Between DOB to IFSP for Identified Infants 2004

2004 Infants N=12	DOB	Date of IFSP	Total Months from DOB to IFSP
SA	9-04	2/05	11 months
KB	10-04	5/05	18 months
SE	7-04	9/05	10 months
SE	7-04	9/05	10 months
AE	5-04	4/05	13 months
RL	8-04	6/05	10 months
ALG	1-04	5/04	4 months
ALG	1-04	5/04	4 months
CJM	7-04	4/05	8 month
VS	4-04	7/04	3 months
CS	7-04	4/05	12 months
TW	2-04	6/05	16 months
<b>Range: 3 months to 18 months</b> <b>Average Months from DOB to IFSP in 2004:</b> <b>9.9 Months</b>			

# Brief Discussion

Discussion Question:



What do you think made the difference that changed the time from DAE to IFSP of 23.1 in 2003 to 9.9 months in 2004?

# How is Guam doing with follow up for infants with High Risk factors?

**2004 Infants with High Risk Factors Receiving Follow Up Services**

<b>2004 MONTH</b>	<b>Number of HIGH RISK INFANTS</b>	<b>Number Tested at 6 Months Follow Up</b>	<b>PASSED</b>	<b>REFERRED</b>	<b>INCOMPLETE Hearing Screening</b>	<b>Number Lost to Follow Up</b>	<b>% of High Risk Infants Lost to Follow up</b>
January	43	4	3	0	1	39	91%
February	12	0	0	0	0	12	100%
March	28	4	4	0	0	24	86%
April	34	11	9	0	2	23	68%
May	29	11	4	2	5	18	62%
June	22	6	5	0	1	16	73%
July	27	8	5	1	2	19	70%
August	29	3	3	0	0	26	90%
September	31	4	3	0	1	27	87%
October	36	9	6	1	2	27	75%
November	31	1	1	0	0	30	97%
December	16	0	0	0	0	16	100%
<b>TOTAL</b>	<b>338</b>	<b>61</b>	<b>42</b>	<b>4</b>	<b>15</b>	<b>277</b>	<b>82%</b>

# Brief Discussion

- Discussion Question

Why do you think Guam is experiencing an 82% loss to follow up for high risk infants who have been scheduled for rescreen in 6 months?



# So, how would we rate Guam's effort so far in UNHS..

- Providing a hearing screening test to all babies born on Guam?
  - Providing full audiological diagnostic services to babies who are referred for hearing loss?
  - Providing Early Intervention services to infants found to have a hearing loss?
  - Providing follow-up for infants with high risk factors?
- Excellent, Good, Fair, Poor, Terrible
  - Excellent, Good, Fair, Poor, Terrible
  - Excellent, Good, Fair, Poor, Terrible
  - Excellent, Good, Fair, Poor, Terrible



Now...let's look at some of research  
on infant hearing screening  
outcomes...

What are studies really telling us?  
How can Guam improve?

## Does “early” really mean “early” when we are talking about infants with suspected hearing loss?



- Christine Yoshinaga-Itano (2003)  
University of Colorado, Boulder
- Has been studying outcomes since 1994 and published research findings on language, speech, and social-emotional development of children who are deaf and hard of hearing, all of whom had hearing parents
- Found that language development is positively and significantly affected by the age of identification of hearing loss and age of initiation into intervention services.

# Does really early identification and follow up really make a difference?



- **Apuzzo & Yoshinaga-Itano (1995) compared the development of 4 groups of children:**
  - (1) 14 Early Identified (EID) children in the first 2 months of life identified through high-risk register,
  - (2) 11 children identified between 3 and 12 months
  - (3) 30 participants identified between 13 and 24 months and
  - (4) 14 children identified 25 months or greater on



# Does really early identification and follow up really make a difference?

**8 subtests of the Minnesota Child Development Inventory (MCDI): 1. general development 2. self-help 3. situation comprehension 4. conceptual comprehension 5. expressive language 6. gross motor 7. fine motor 8. personal-social**

**FINDINGS: Group 1 had significantly higher language quotients (LQ=87) than those in Group 2 (LQ=58), Group 3 (LQ=68), and Group 4 (LQ=58)-between 20 to 30 points!**

**An LQ of 87 is within the low average range of development while an LQ of 58 is significantly delayed from the average range of development**



# What is the critical age?

- Yoshinaga-Itano et al. (1998).
- Studied 150 deaf and hard of hearing infants and toddlers (72 EID, and 78 later identified/intervened [LID] ) found significantly higher language development on the MCDI among children identified with hearing loss and placed into intervention by 6 months of age.



# Details of the Findings



- FINDINGS: “The first 6 months of life represents a particularly sensitive period in early language development, a window of opportunity for initiation of intervention services. Access to language during this period provides an opportunity for children with significant hearing loss to develop language skills that are slightly depressed from the mean language of children with normal hearing (low average) but within the normal developmental continuum.”
- Children with hearing loss identified in the first 2 months, 3<sup>rd</sup> and 4<sup>th</sup> months and 5<sup>th</sup> and 6<sup>th</sup> months of life had similar language development quotients, language development proportionate to their chronological age.
- Regardless of the month of identification in the first 6 months, these children had developmental profiles at the low average range of the development of children with normal hearing.

# Other Conclusions:



- Yoshinaga-Itano et al. (1998). *Continued*
- There were no significant differences in the language development of children identified at 7-12 months, 19-24 months, or 25-30 months. Age of identification of hearing loss between 7 to 30 months did not significantly affect language quotients, nor was time at intervention significantly correlated with language quotients.
- However when EIDs were compared with LIDs the EIDs differed significantly from the LIDs in language quotients.
- These findings may imply that early intervention for LID children can keep language delays from increasing, but closing developmental delays at the time of diagnosis of hearing loss is much harder, as it would require children to make language gains greater than the development of typically developing hearing children.
- EID children maintained language development similar to their nonverbal cognitive symbolic play development from the Play Assessment Questionnaire, while LID children evidenced greater than a 20-point discrepancy between nonverbal cognitive development and language development.

# What happens when they get to Kindergarten?

- Moeller (2000) studied 112 participants with hearing loss and no additional disabilities when they were 5 years old and found that these variables tended to predict language outcomes by age 5:



# Moeller's Findings

- Age of initiation of intervention
- Level of parental involvement
- Nonverbal intelligence
- She also found that children identified and receiving EI services between birth to 11 months had developmental quotients within the low normal range of development



# Studies conducted and children studied



- Calderon and Naidu (2000) conducted a longitudinal study of 80 children: 9 entered EI by 12 months of age, 39 entered EI by 13 to 24 months of age, and 32 entered EI between 25 and 36 months of age.
- FINDINGS: Age of entry into EI significantly predicted receptive language posttest scores, expressive language posttest scores, auditory discrimination posttest scores, and speech production posttest scores.
- They also studied 5 of the children who had EI prior to 13 months to 23 children who had EI later (mean of 26 months). Language development was measured between the ages of 9 month and 52 months, postgraduation from EI, and the children were between 45 and 88 months of age.
- FINDINGS: The children who entered into EI earlier had significantly higher receptive and expressive scores on the Language Development Scale and marginally significant differences on the PLS. Also mothers of EID children tended to be more involved than the LID group.

# Brief Discussion

Discussion Question:



Why do you think EID mothers were more likely to be involved with their infants that LID mothers?



# Bibliography



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