Children labeled medically complex enrolled in Early Intervention

Susan Wiley, MD
Jareen Meinzen-Derr, PhD
Dan Choo, MD

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Background

- Approximately 40% of children with hearing loss have additional developmental concerns
- This high rate may be due to an increasing ability to support children born extremely prematurely and reliance on life-saving supports for medically complex children
- These children are increasingly served by early intervention (EI)

State System

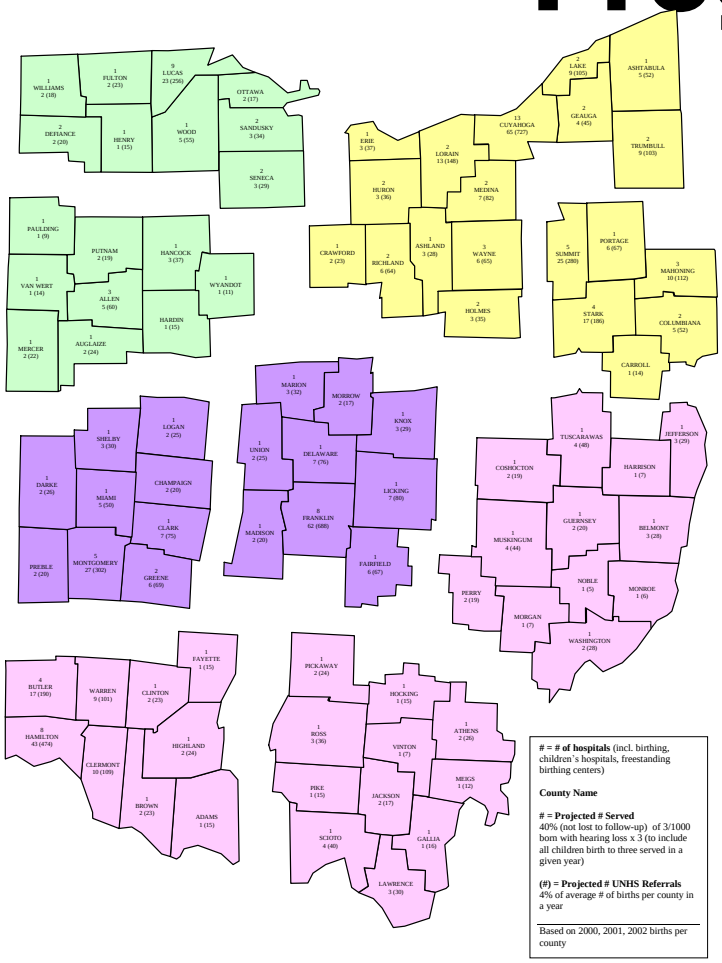
- Regionalized tracking of children not passing UNHS is paired with the Early Intervention System (Regional Infant Hearing Programs)

- This system also collects child data about hearing loss and other issues

Annually in Ohio:

- Approximately 150,000 births per year
- Approximately 6000 non-pass UNHS
- Approximately 450 expected to be born with some degree of hearing loss

Regional Infant Hearing Programs



Coordinates tracking and follow-along for newborns identified through Ohio's newborn hearing screening program

Assures that all families enrolled in the program receive Part C core services

Provide Early Intervention specific to hearing loss
Provides services at no cost to the families

Have strong community linkages

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SKI*HI Curriculum

- The Parent Advisors are SKI*HI trained

- SKI*HI : specialized curriculum offering nonbiased information on communication choices, ongoing home and family centered support for infants and children with deafness or hearing loss

http://www.skihi.org/ (Utah State University)

Objectives

- To compare medically complex children who are Deaf/hard of hearing (HOH) to children without medical complexities enrolled in EI in one state between years 2003-2006

- To understand language growth in the population of children enrolled in early intervention services for Deaf/hoh described as medically complex

Methods

- Children with permanent HL
- Enrolled in RIHP EI program 2003-06
- SKI*HI Language Development Scale
  - At least every 6 months
  - Provides units for specific ages
  - Language quotient (LQ) was created by dividing the actual score (unit completed) with the unit that signifies the appropriate language skills for the child's current age

Medically Complex

- Determined by Regional Infant Hearing Program Parent mentors

- Typically children with medical diagnoses such as
  - seizures
  - tracheostomy
  - G-tube
  - children with some syndromes likely represented in this group as well

Methods

- Children with complex medical condition (n=177) were compared to children without medical complexities (n=328*) regarding HL characteristics

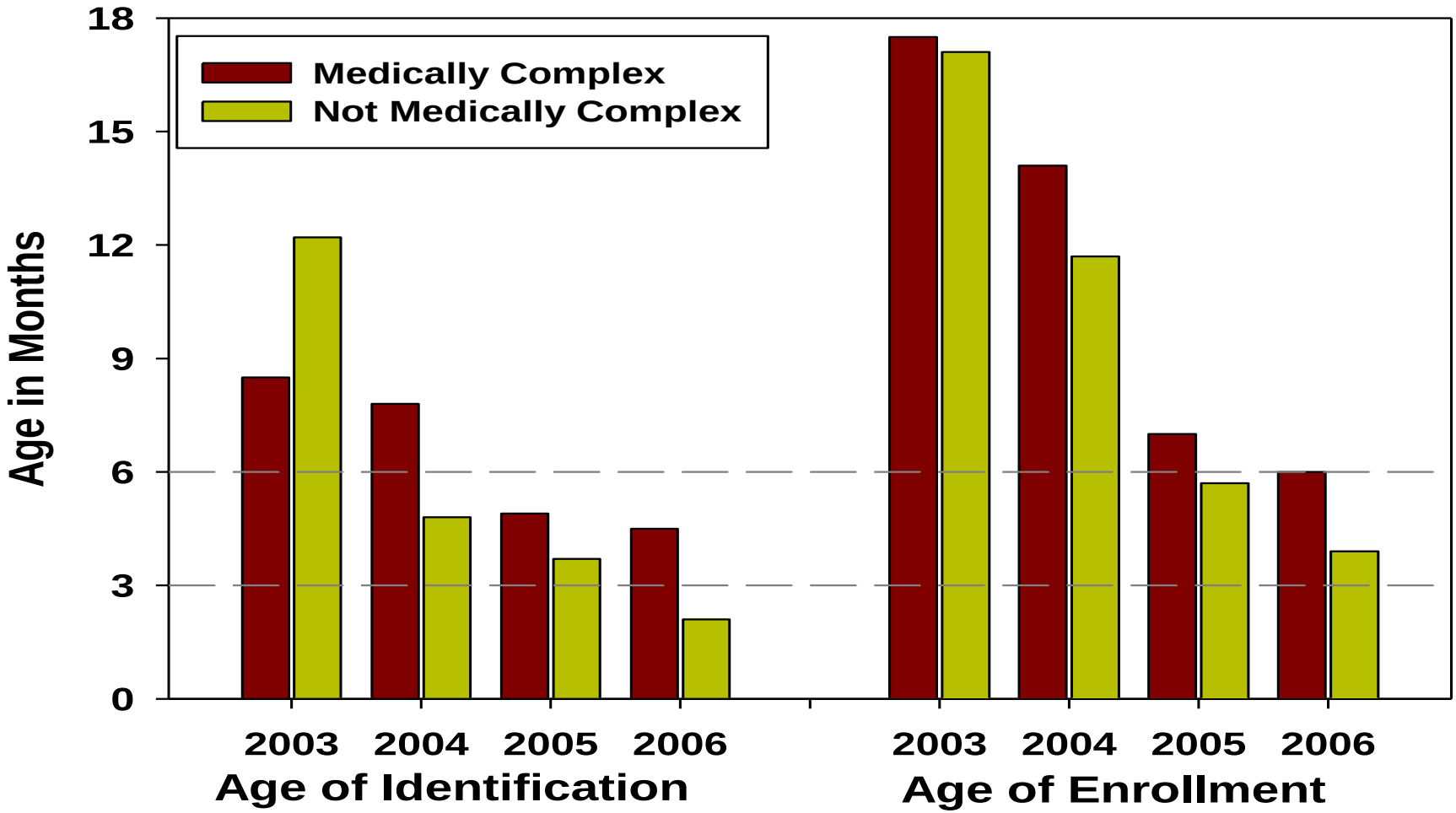
- Analysis of language among MC children
  - Changes in language units (representing gains in language skills)
  - Language quotients over time (representing language levels relative to age of child)

- Baseline language levels by early EI enrollment (<6 mos of age) late EI enrollment (≥6 months)

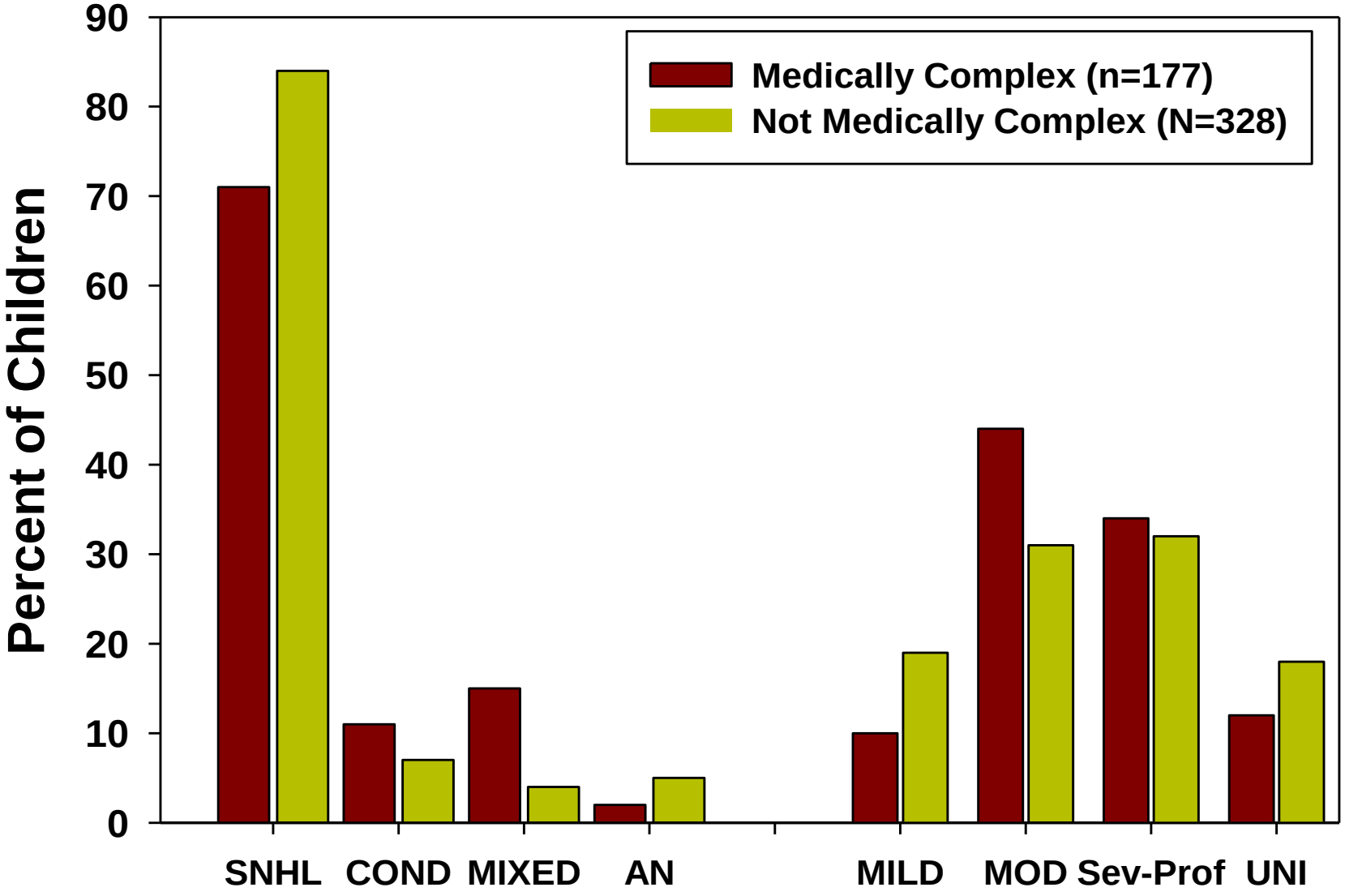
- Change of language over 1st 12 mos of EI

*Am Ann Deaf, Winter 2011

Decreasing ages over time



Type and Level of HL



	Medically Complex N=177	**Not Complex** n=328
Median age months at ID	5.5 (2.7-11.4)*	3.4 (1.7-9.2)
Median age at EI enrollment	8.6 (4.8-15.6)*	6.5 (3.2-15.5)
% enrolled by 6 months	36%*	49%
Received amplification	77%	76%
Median age at amplification	9.5 (6.3-18.2)*	7 (4.2-16.1)
% of children with severe to profound SNHL receiving CI	28%*	52%

Median with interquartile range reported
**p<0.01 difference between groups*

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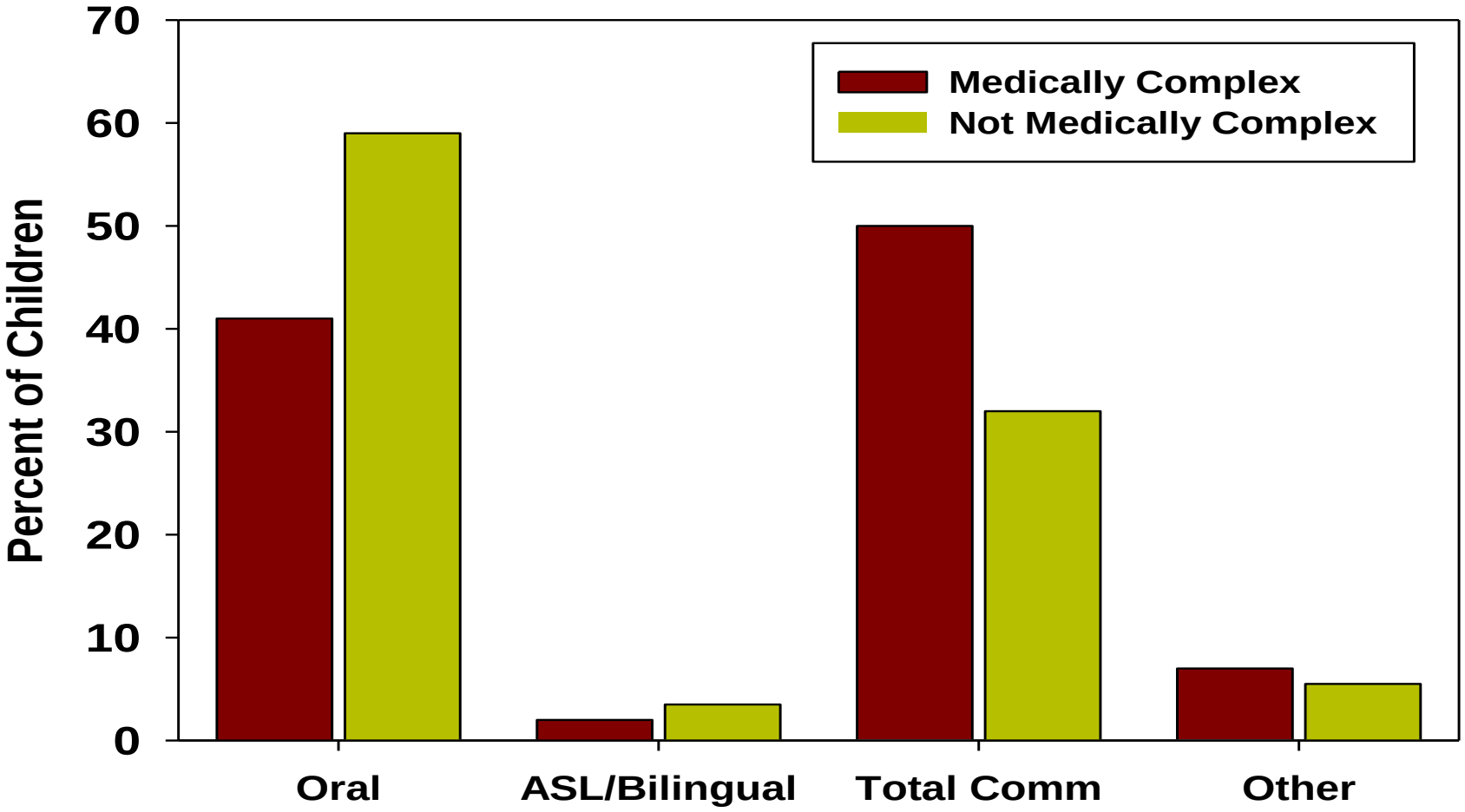
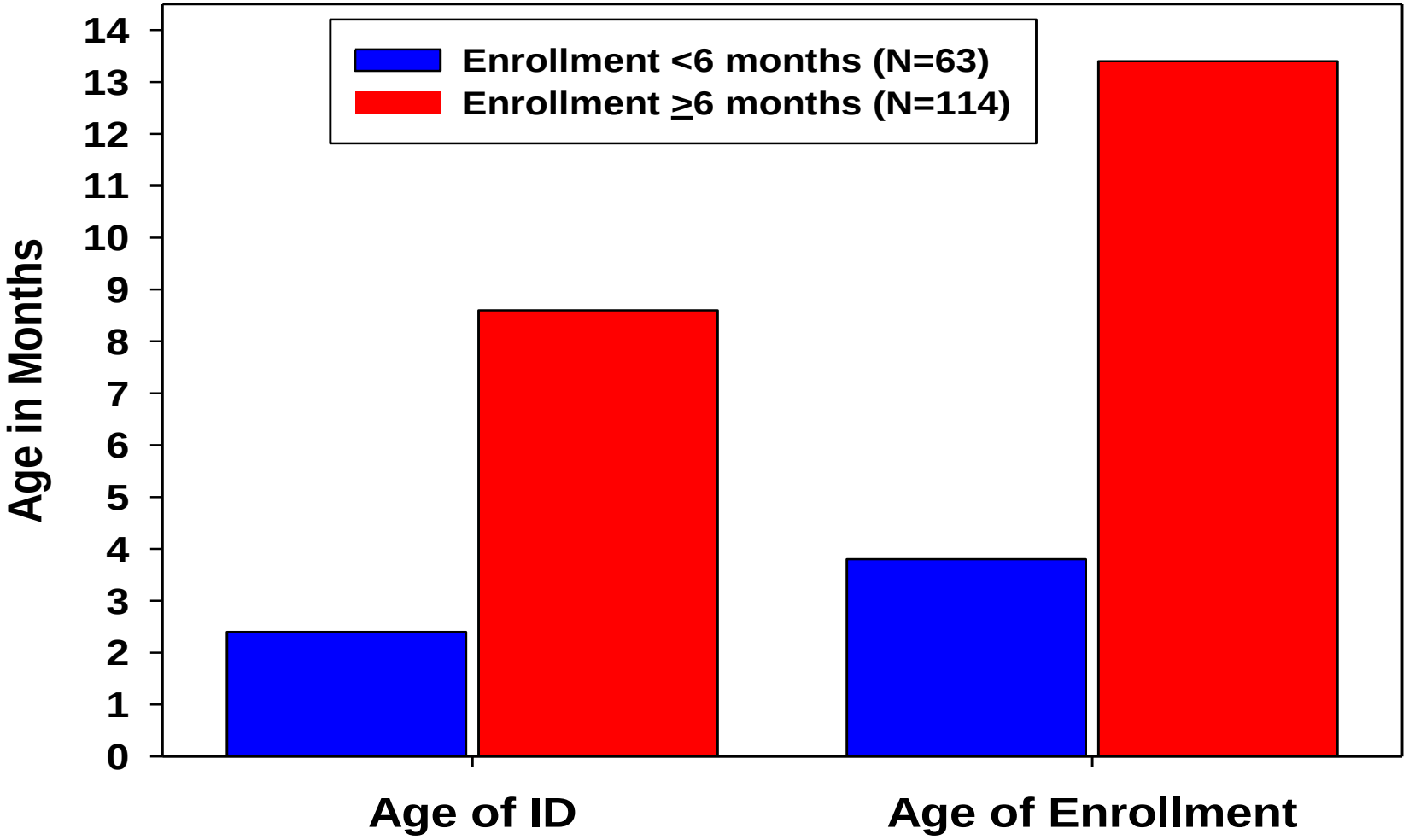
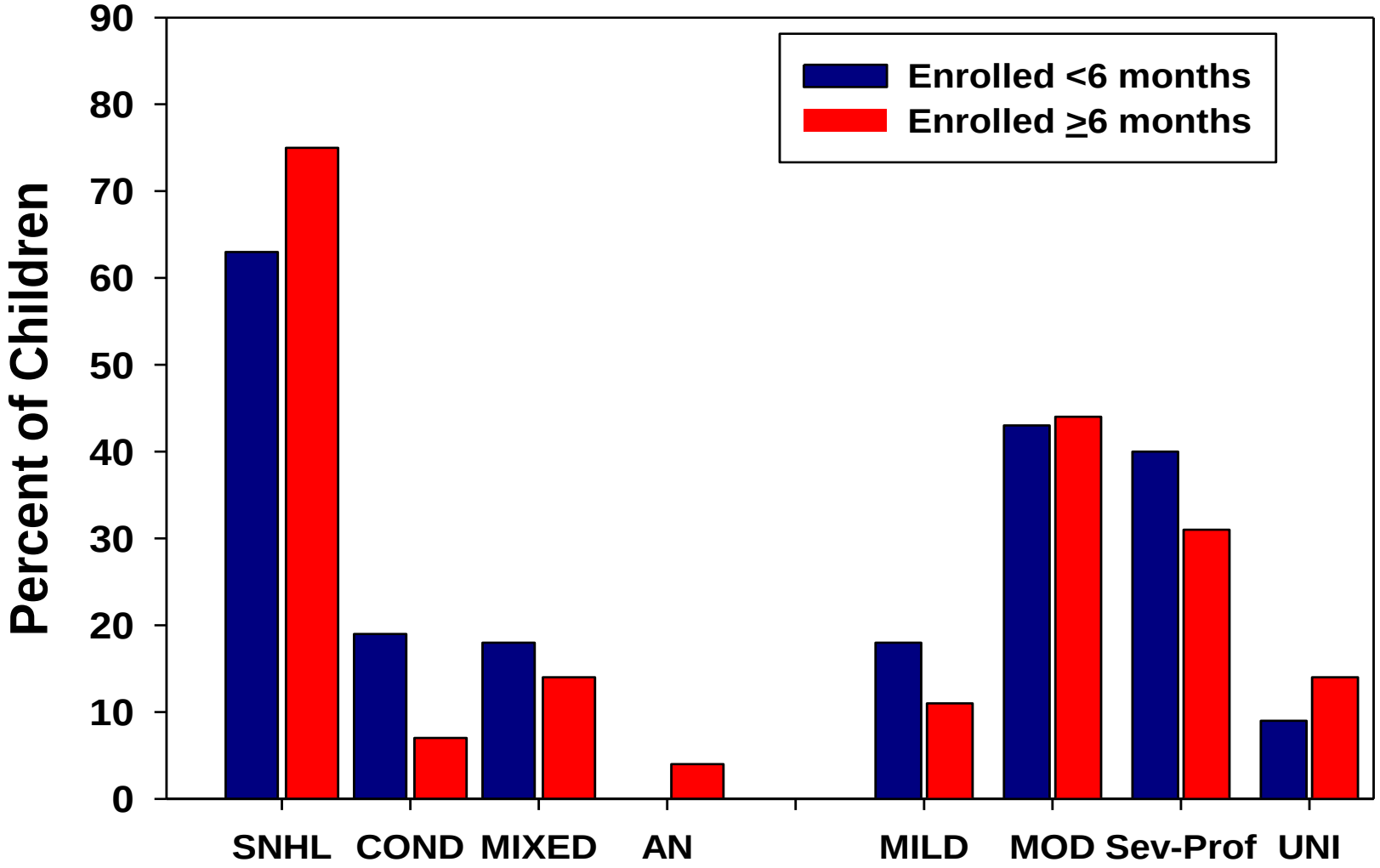
Communication Modality



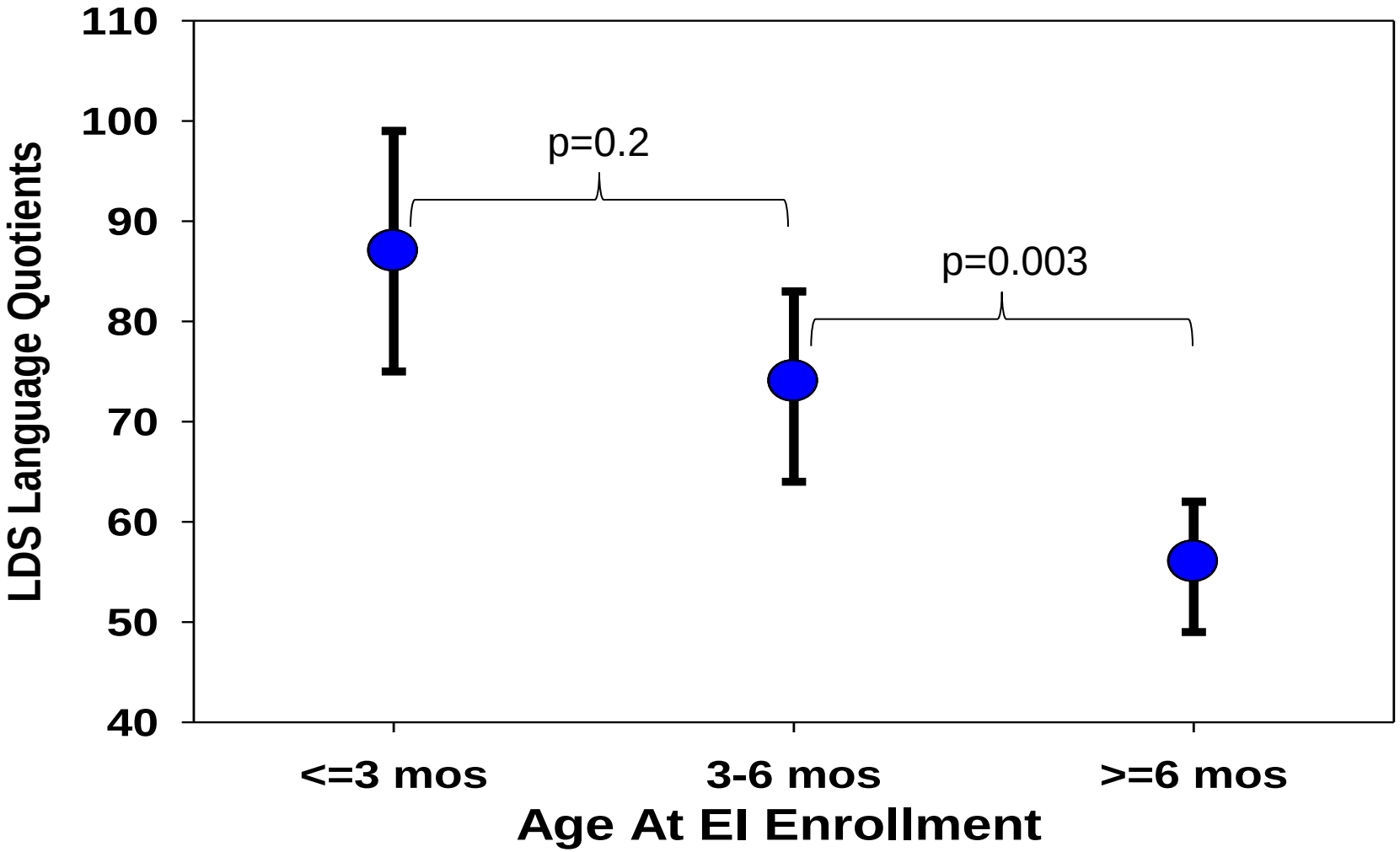
Medically Complex by enrollment age



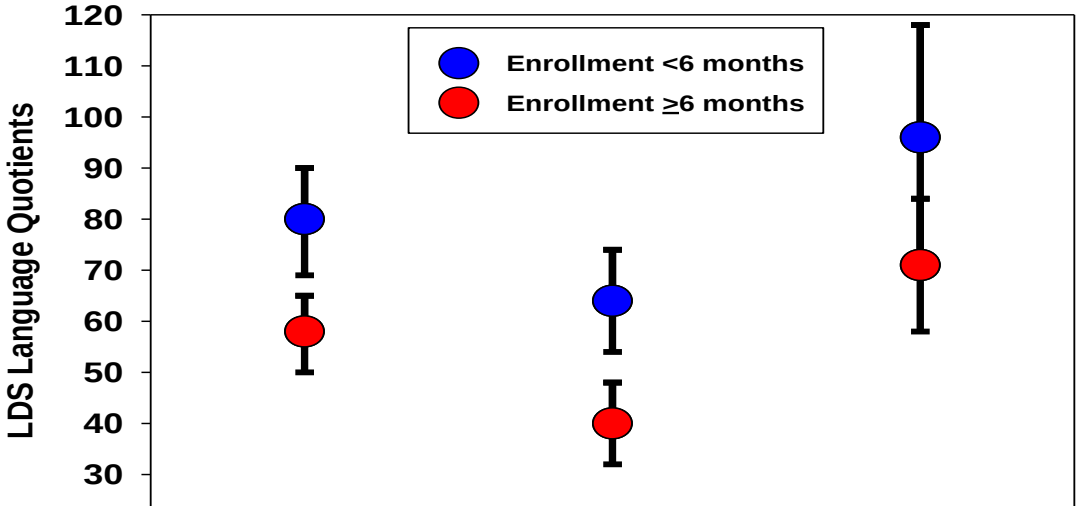
Medically Complex by enrollment age



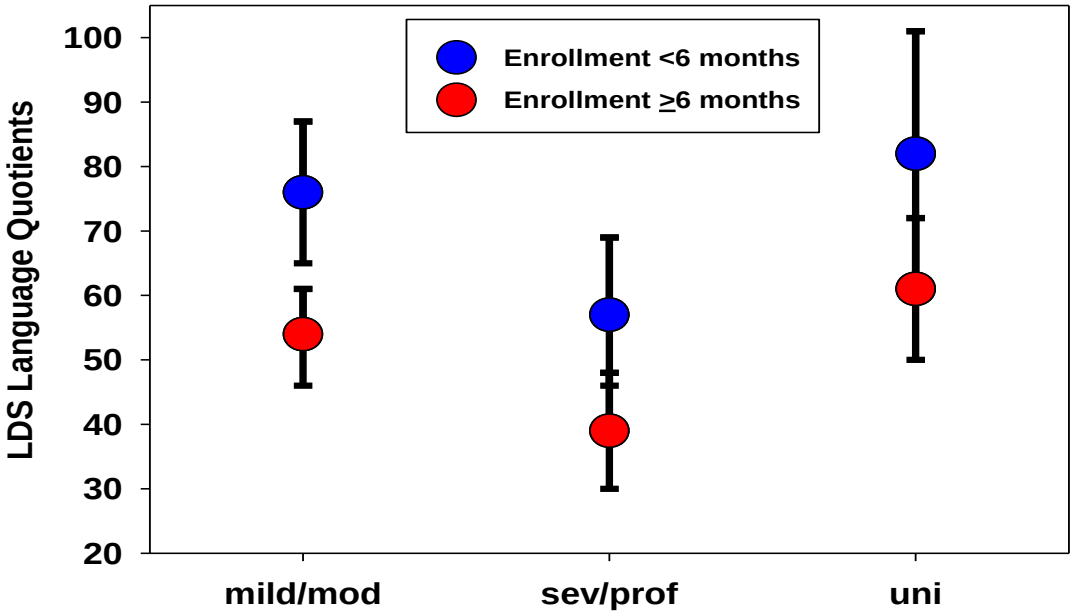
Bilateral Baseline Language by Enrollment Age



Adjusted mean baseline quotients



Receptive



Expressive

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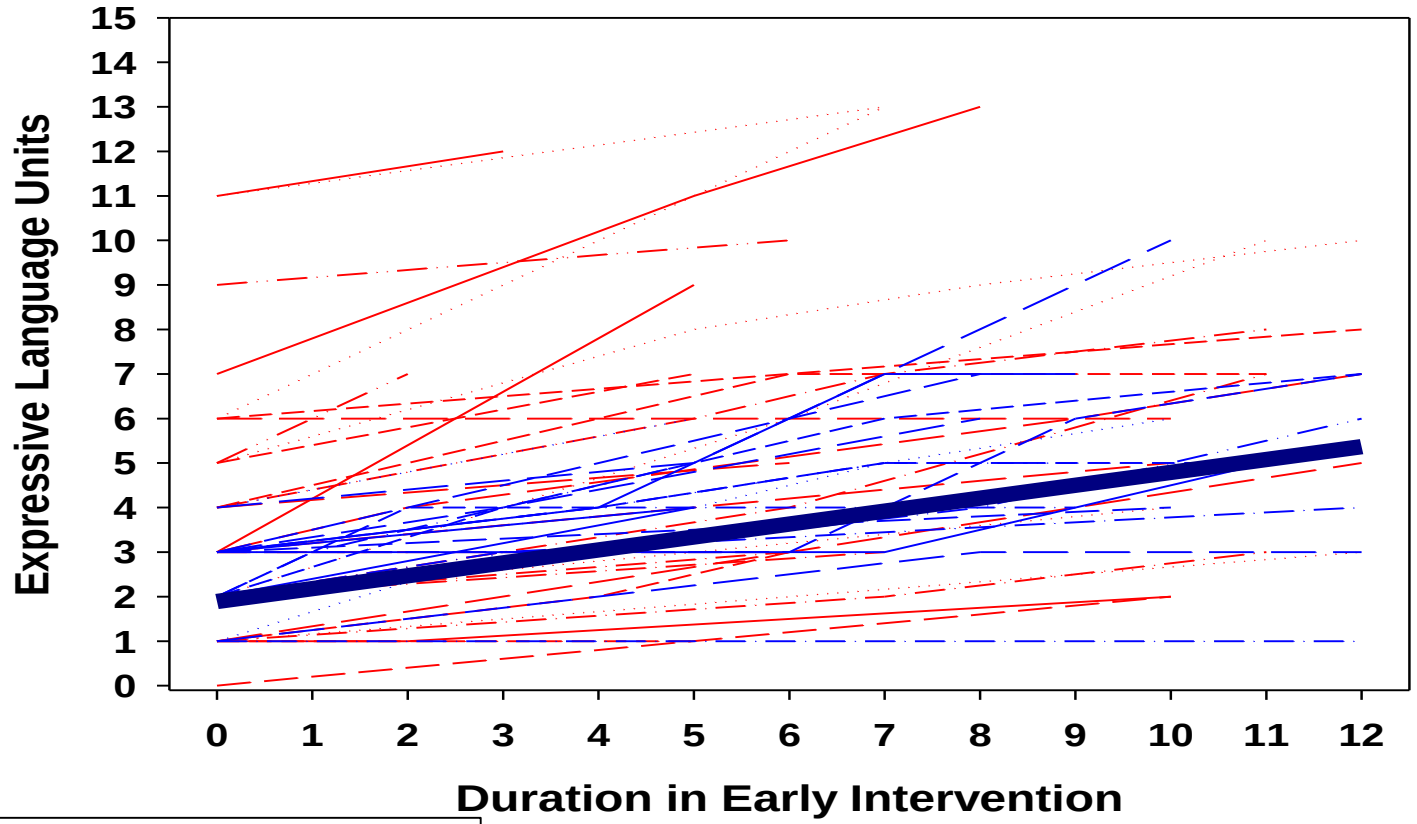
Expressive Language Gains

Mild/Moderate Hearing Loss



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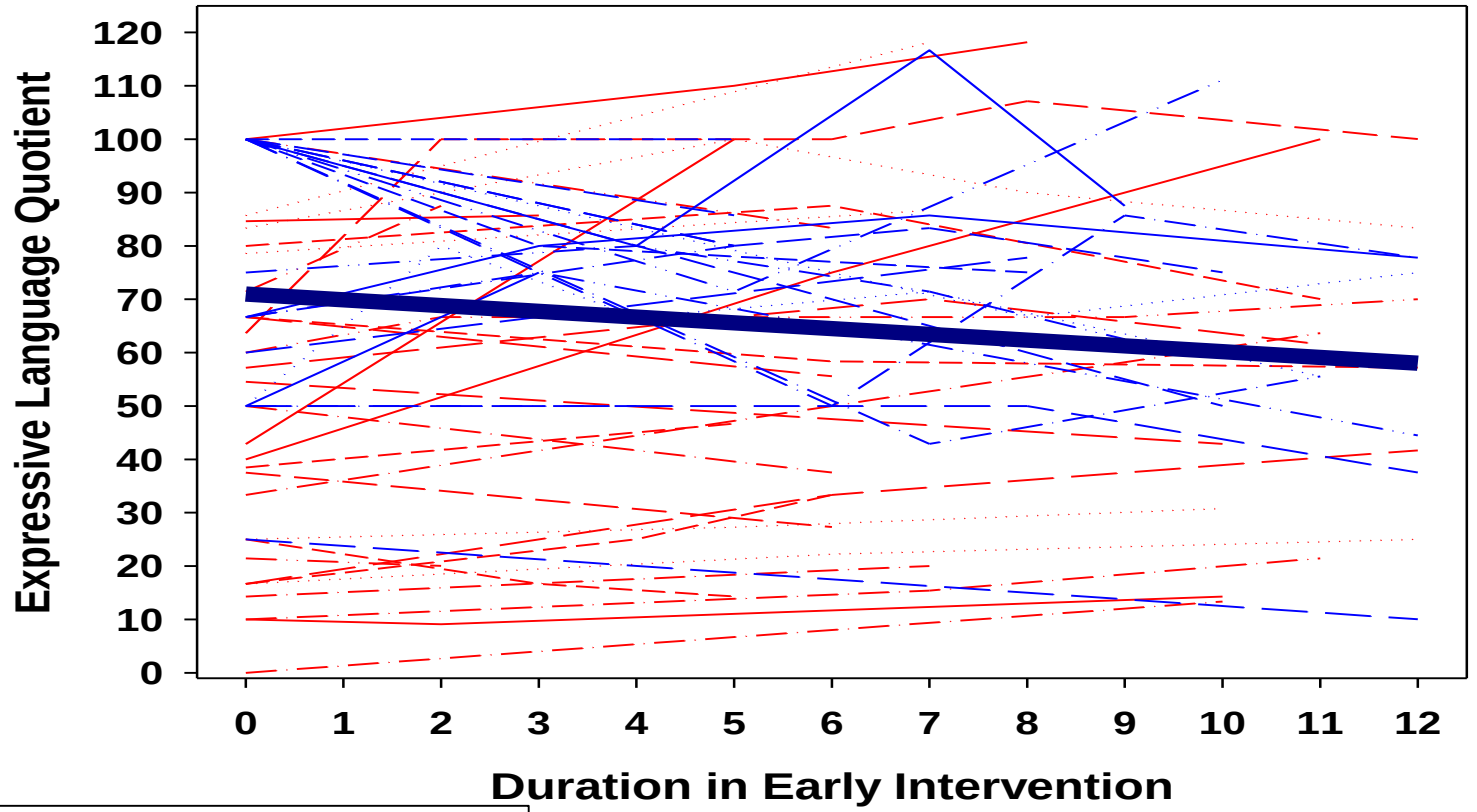
Expressive Language Relative to Age

Mild/Moderate Hearing Loss



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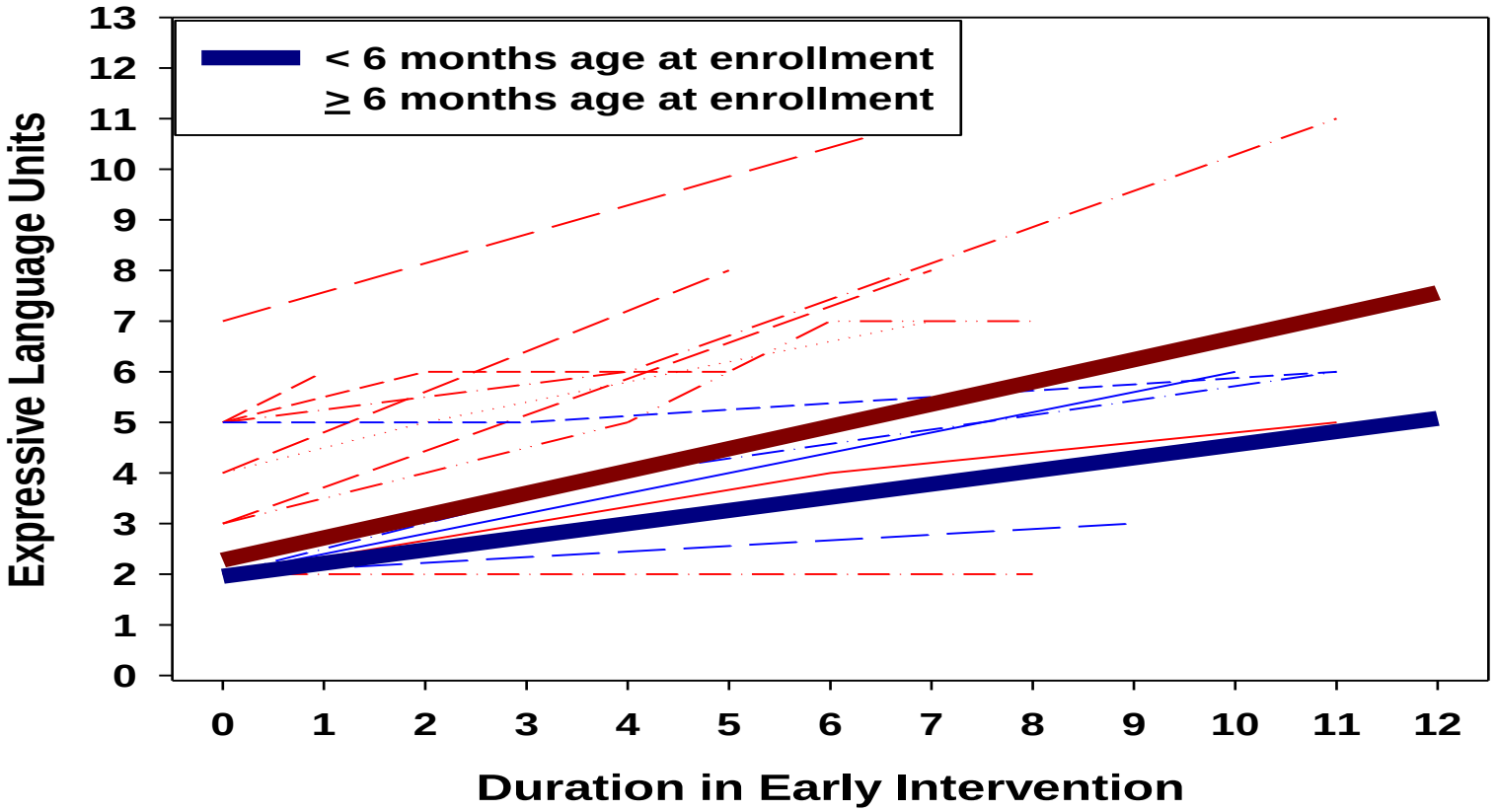
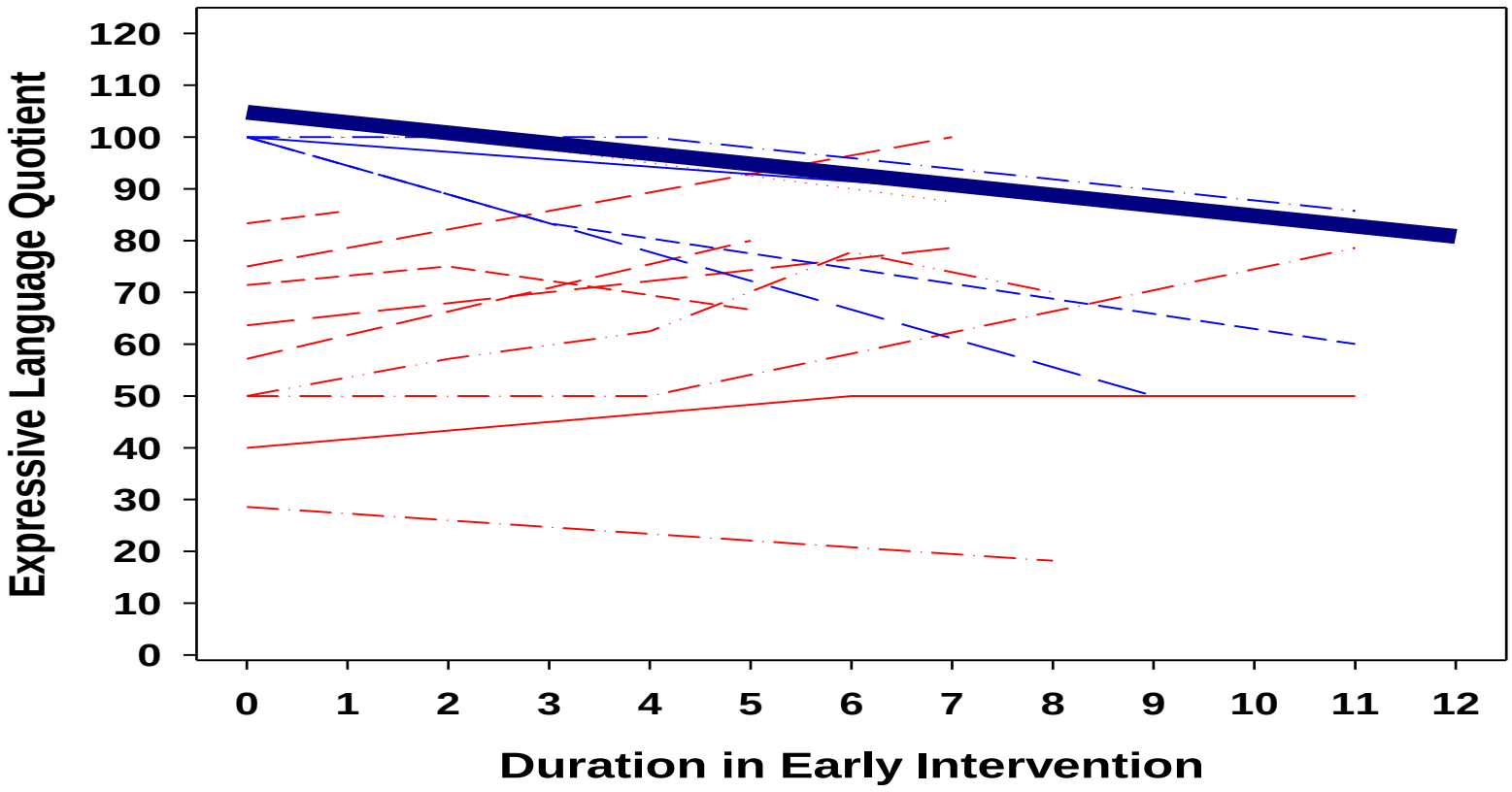
Expressive Language Gains

Unilateral Hearing Loss



Expressive Language Relative to Age

Unilateral Hearing Loss



< 6 months age at enrollment
≥ 6 months age at enrollment

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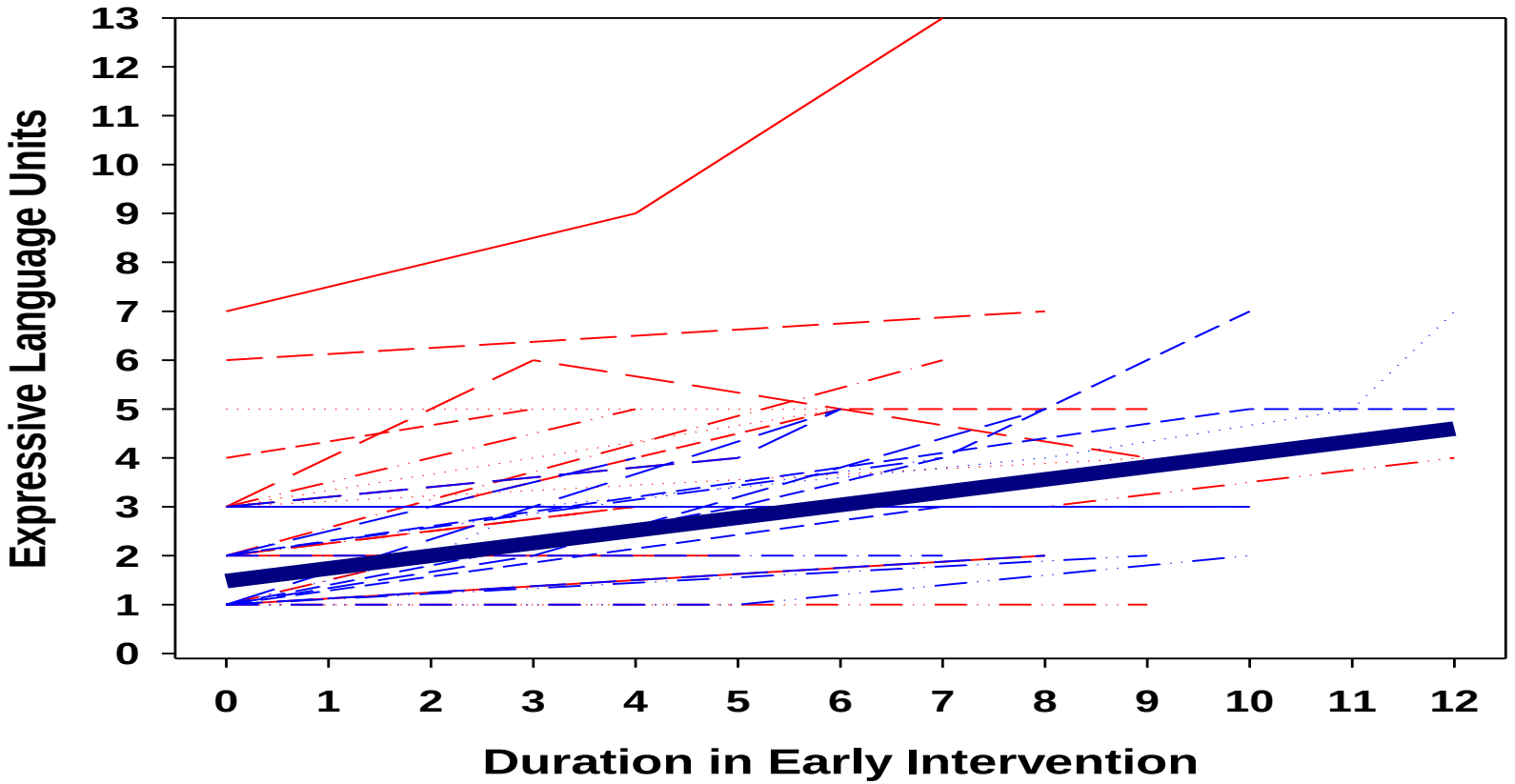
Expressive Language Gains

Severe to Profound Hearing loss



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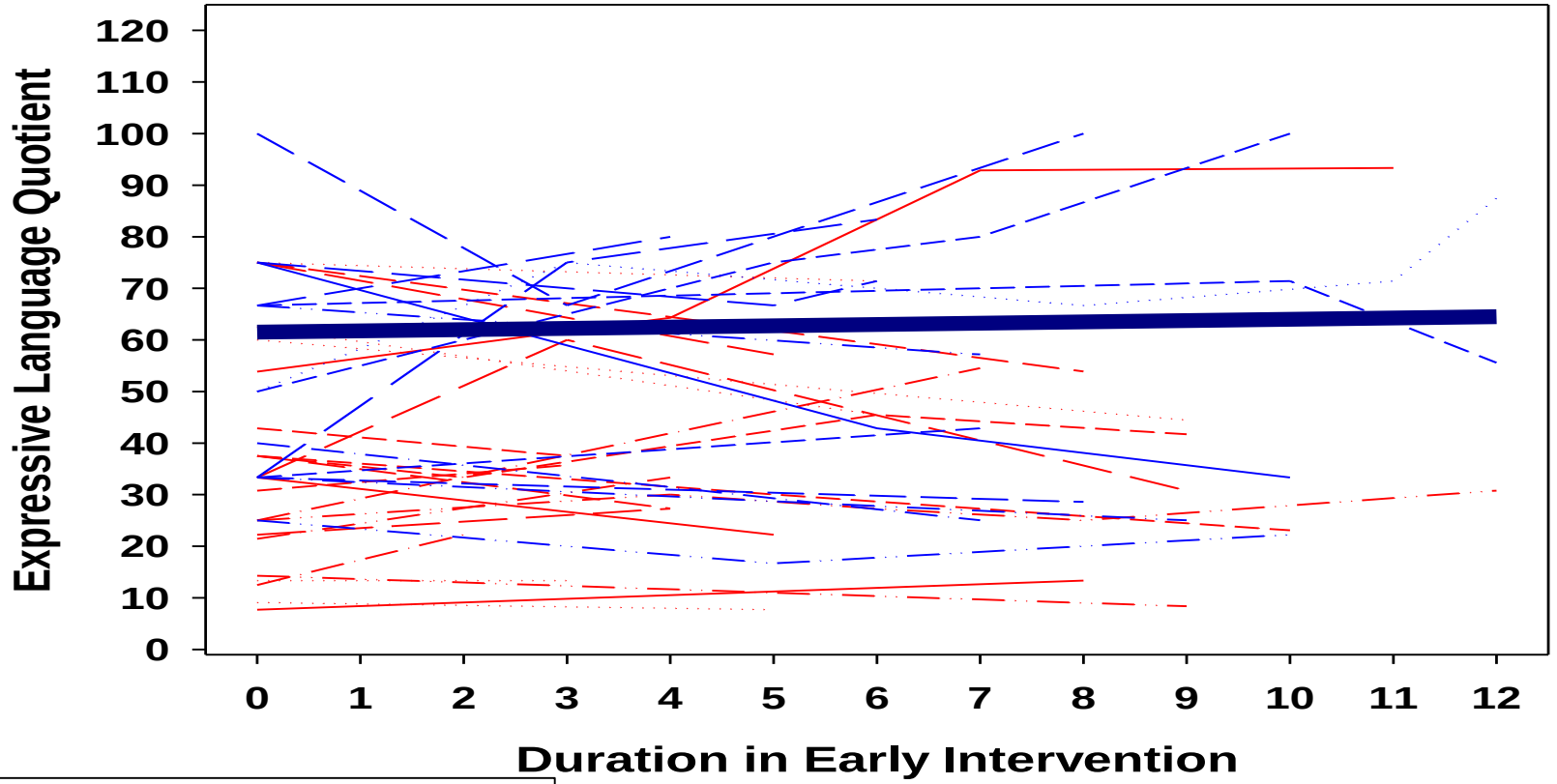
Expressive Language Relative to Age

Severe to Profound Hearing Loss



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Language Outcomes Among MC

- For all degrees of HL, MC entering EI early had significantly higher mean baseline LQ (>20 points, $p<0.01$) than late entry children
- Children enrolled early with severe/profound HL made significant language gains ($\beta=0.27$, $p<.0001$) in the 1st year, with LQ remaining steady
- Similar gains were seen among those enrolled late ($\beta=0.28$, $p<.0001$), with potential for increase in LQ ($\beta=0.76$, $p=0.2$)
- Children with mild/moderate HL had similar gains ($\beta=0.33$, $p<.0001$), with increasing LQs among late entry group ($\beta=0.86$, $p=0.01$), indicating possible "catch up" to early entry peers

Limitations

- No definition of medically complex
- Language quotients rather than standard scores
- No developmental/cognitive proxy measure in either group

Summary of Findings

- Both groups received amplification at equal rates, however the medically complex were fit with amplification at older ages
- Despite similar rates of severe-profound SNHL, children who are medically complex were less likely to receive cochlear implants (28% vs 52%)
- Children with medical complexities compared to those with no medical complexities were less likely to meet the 1-3-6 goals regarding identification and enrollment

Summary of Findings

- MC children who entered EI <6 months of age had significantly higher baseline language than children who entered ≥6 months of age

- Age at EI enrollment seemed to be the most important factor for language in this population of children

Thank you

- Ohio Department of Health


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Among those labeled MC

	Enrolled < 6 mos n=63	Enrolled ≥ 6 mos N=114
Median age of ID in mos	2.4 (0-5.5)	8.6 (0-32.3)
Median age of Enrollment	3.8 (0.8-5.9)	13.4 (6-34.5)
Type of HL		
SNHL	40 (63.3%)	86 (75.4%)
Conductive	12 (19%)	8 (7%)
Mixed	11 (17.5%)	16 (14%)
AN	0	4 (3.5%)
Severity of HL		
Mild	5 (17.9%)	13 (11.4%)
Moderate	27 (42.9%)	50 (43.9%)
Severe-Profound	25 (39.7%)	35 (30.7%)
Unilateral	6 (9.5%)	16 (14%)