

The language acquisition of children with hearing loss: Interim results from the LOCHI study

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NAL LOCHI Team

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Participating Centres

Catherine Sullivan Centre, Hear & Say Centre, Matilda Rose Early Intervention Centre, RIDBC, The Shepherd Centre, St Dominic's Centre, St Gabriel's School, Sydney Cochlear Implant Centre, Taigum ECDU and Yerrongpilly ECDU

Supporting Agencies

Australian Hearing, Cochlear Implant Centre – Royal Victorian Eye and Ear Hospital, Hearing Cooperative Research Centre, NIH Grant, OHS, NSW Department of Health, Oticon Foundation



Impact of Hearing Loss

Prevalence

- Moderate or greater loss ~ 1 in 1000

Impact on children

- Auditory skills
- Speech and language skills
- Social development
- Literacy skills
- Educational outcomes



Early Detection and Intervention

Does early detection and intervention lead to improved outcomes for children with a hearing loss?

“There were no prospective studies that directly examine whether earlier intervention result in improved speech, language, or educational development.”

(USPSTF, 2001)



Assessment Points



6mths
post



12mths
post



3yrs
of age



5yrs
of age



9yrs
of age



Child & Family Factors

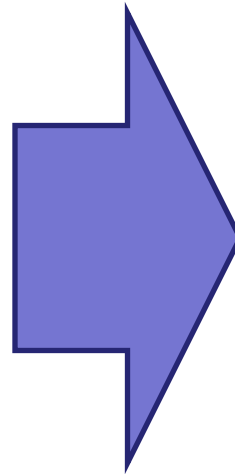
- Age of intervention
- Aetiology
- Hearing thresholds
- Maternal education
- Socioeconomic status
- Cognitive ability
- Additional needs
- Communication mode
- Gender

Device Factors

- Hearing aid prescription
- Cochlear implant parameters

Intervention Factors

- Age of enrolment
- Type and amount
- Family involvement



Child Outcomes

Speech production

Speech intelligibility

Speech perception

Receptive & expressive lang.

Receptive vocabulary

Phonological awareness

Reading and writing

Functional performance

Psycho-social skills

Pragmatics

Educational attainment



Participants

477 current participants

242 NSW

135 VIC

100 QLD

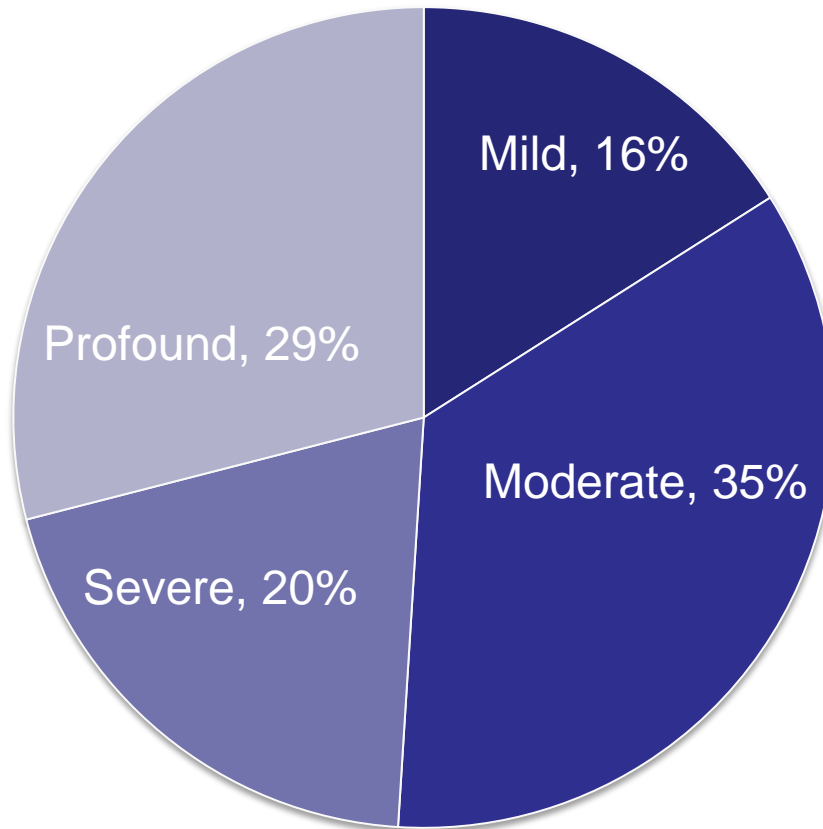
328 using hearing aids

149 using cochlear implants

(83 unilateral, 66 bilateral)



Participants' Hearing Losses

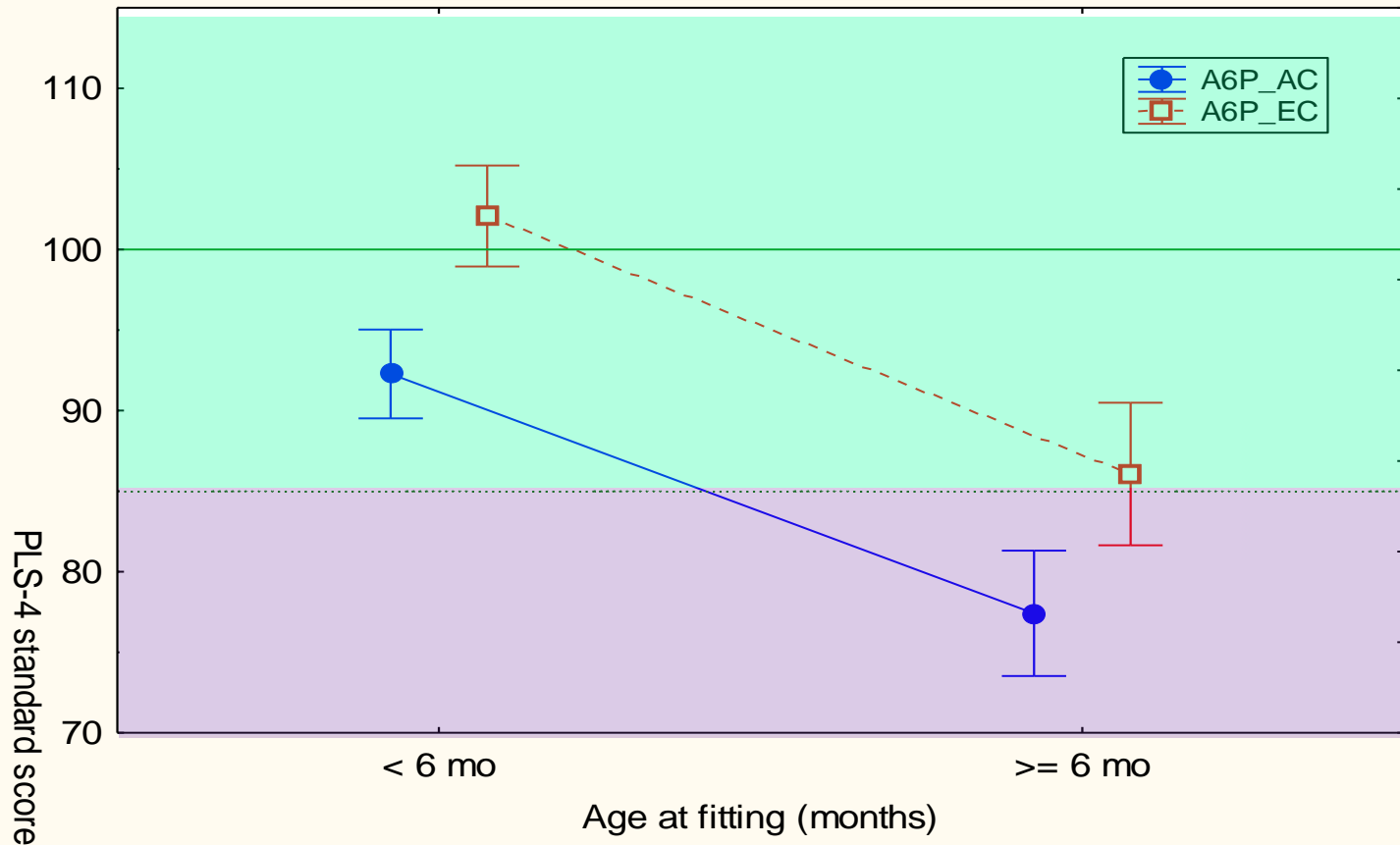


Preliminary Results

PLS-4 at 6mths post-fitting

Covariate means:
F6AV3FAMD: 55.91065

Fitting age: $p < 0.0001$
Hearing loss: $p < 0.0001$

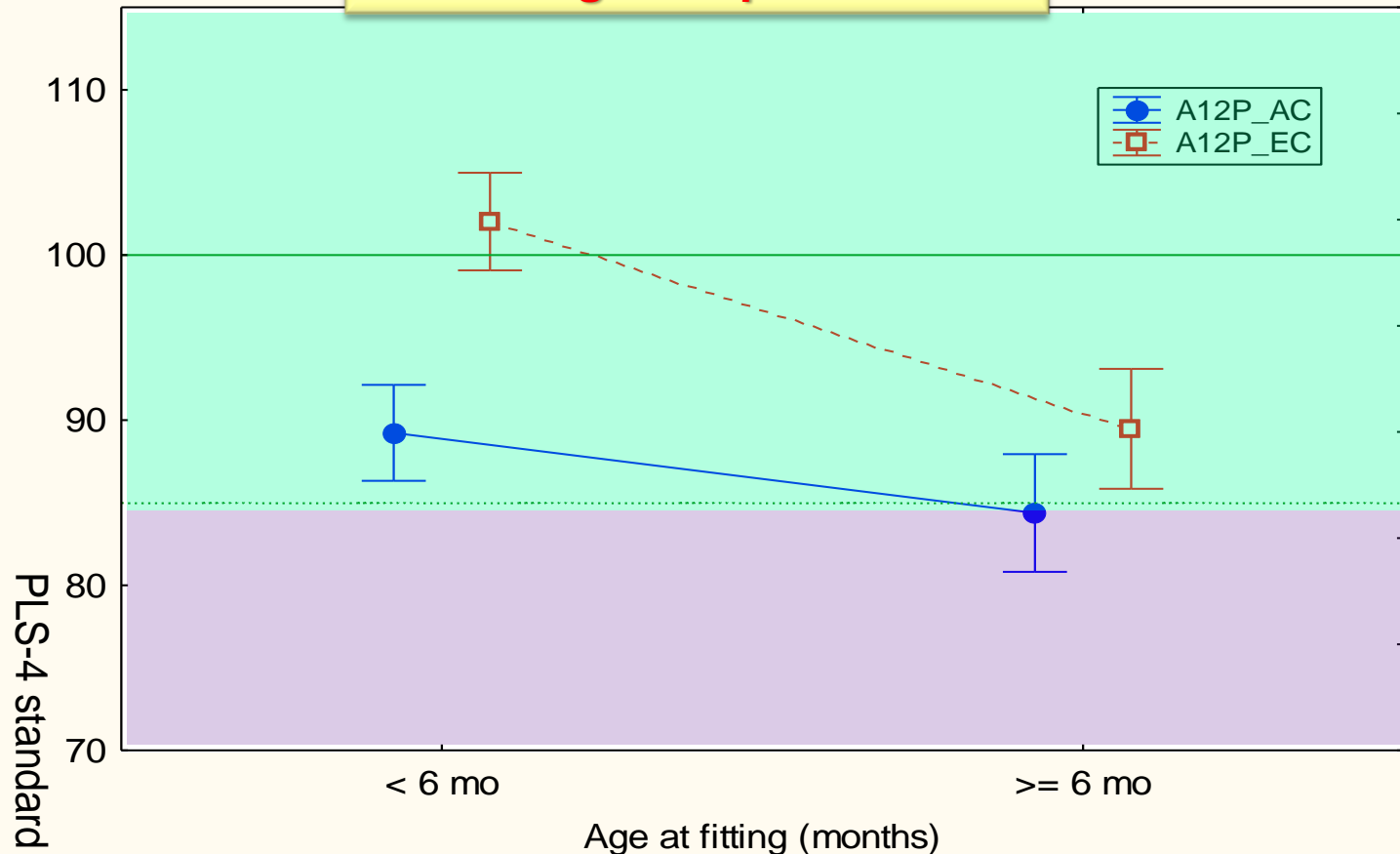


6mths after hearing aid fitting (n=194)

PLS-4 at 12mths post-fitting

Covariate means:
F6AV3FAMD: 53.48506

Fitting age: $p < 0.001$
Hearing loss: $p < 0.0001$

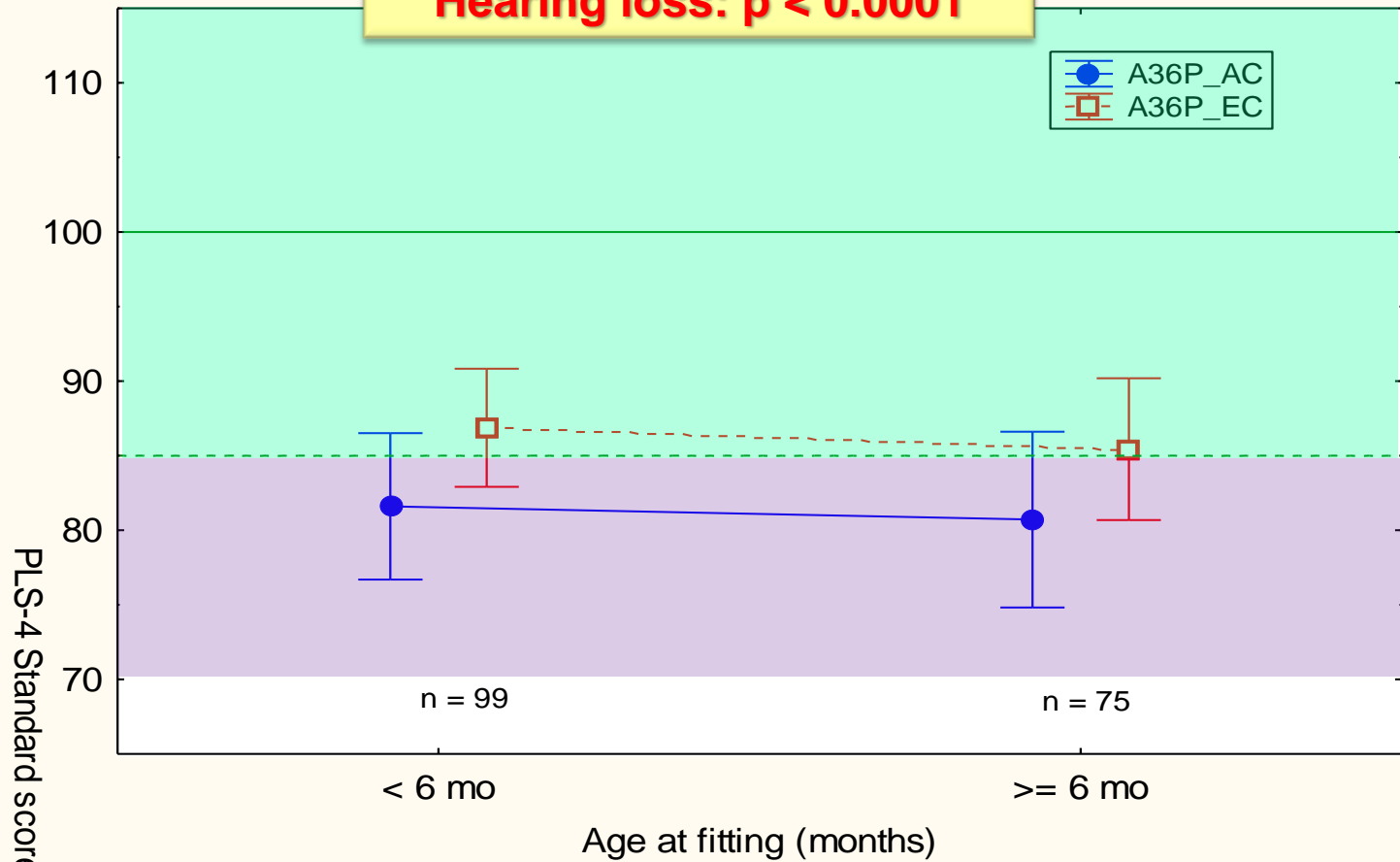


12mths after hearing aid fitting (n=202)

PLS-4 at 3yrs

Covariate means:
F6AV3FAMD: 51.8864

Fitting age: $p = 0.7$
Hearing loss: $p < 0.0001$



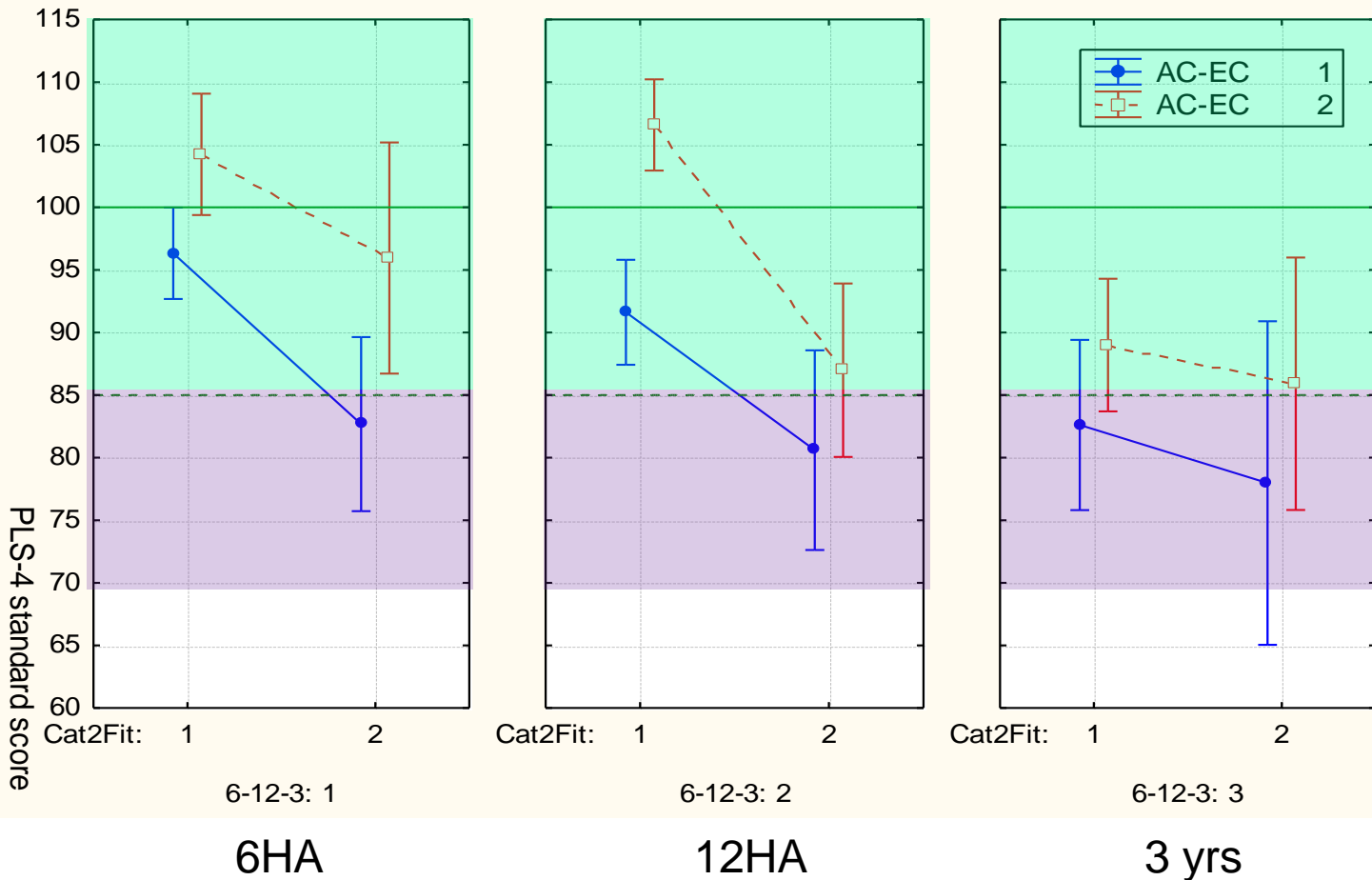
3 years of age (n= 174)



Longitudinal PLS-4 Performance

Covariate means:
F6AV3FAMD: 50.62872

6-12-3*AC-EC*"Cat2Fit"; LS Means
Current effect: $F(2, 120)=3.5525, p=.03170$
(Computed for covariates at their means)
Vertical bars denote 0.95 confidence intervals



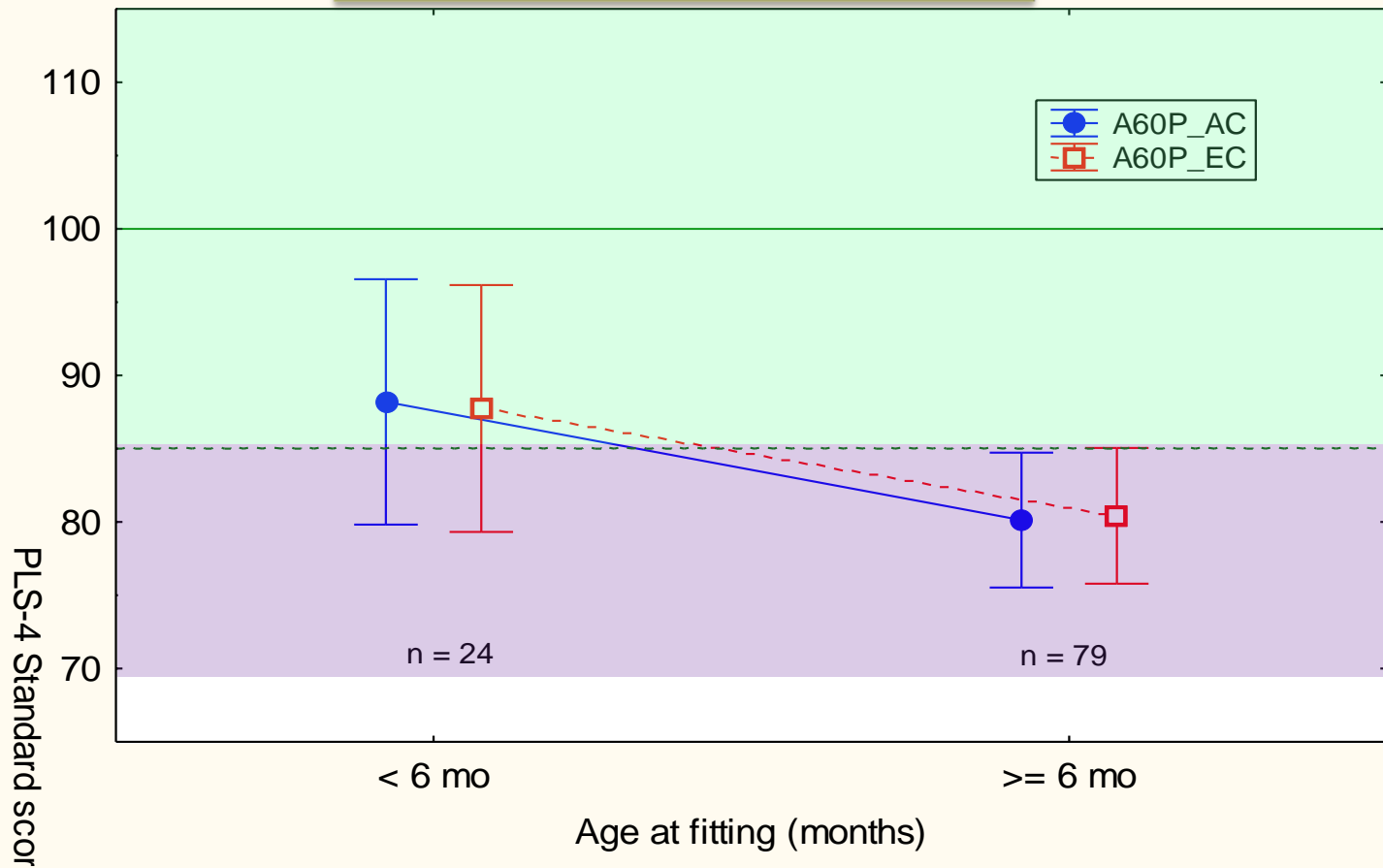
(n = 65)



PLS-4 at 5yrs

Covariate means:
F6AV3FAMD: 52.79968

Fitting age: $p = 0.1$
Hearing loss: $p = 0.03$

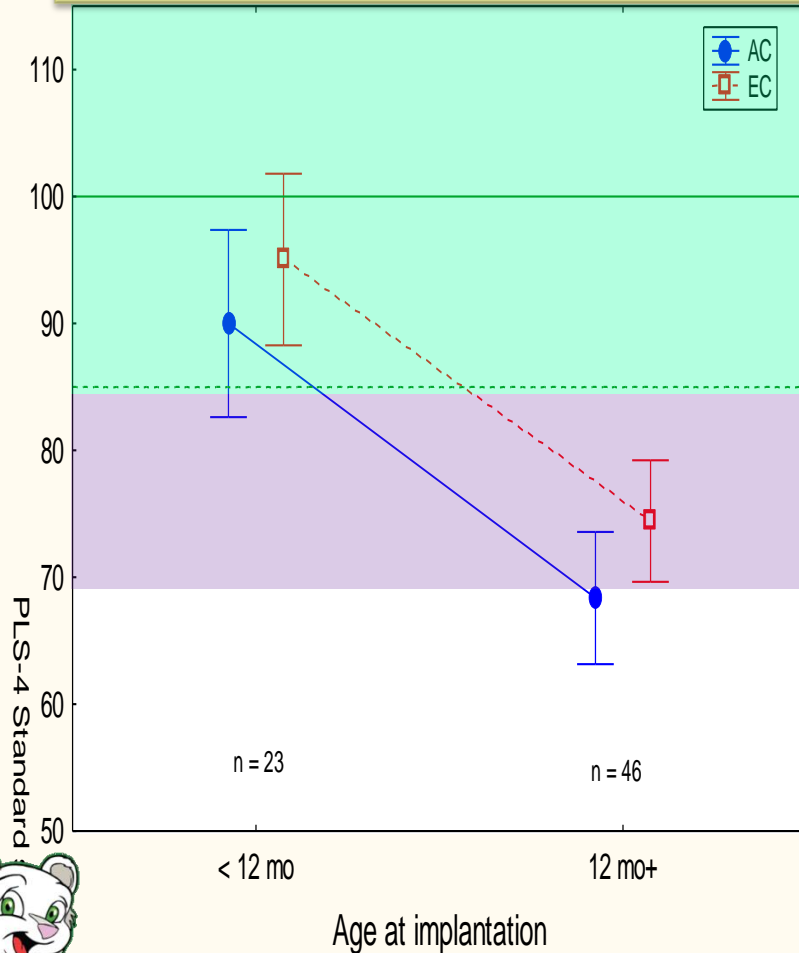


5 years of age (n = 103)



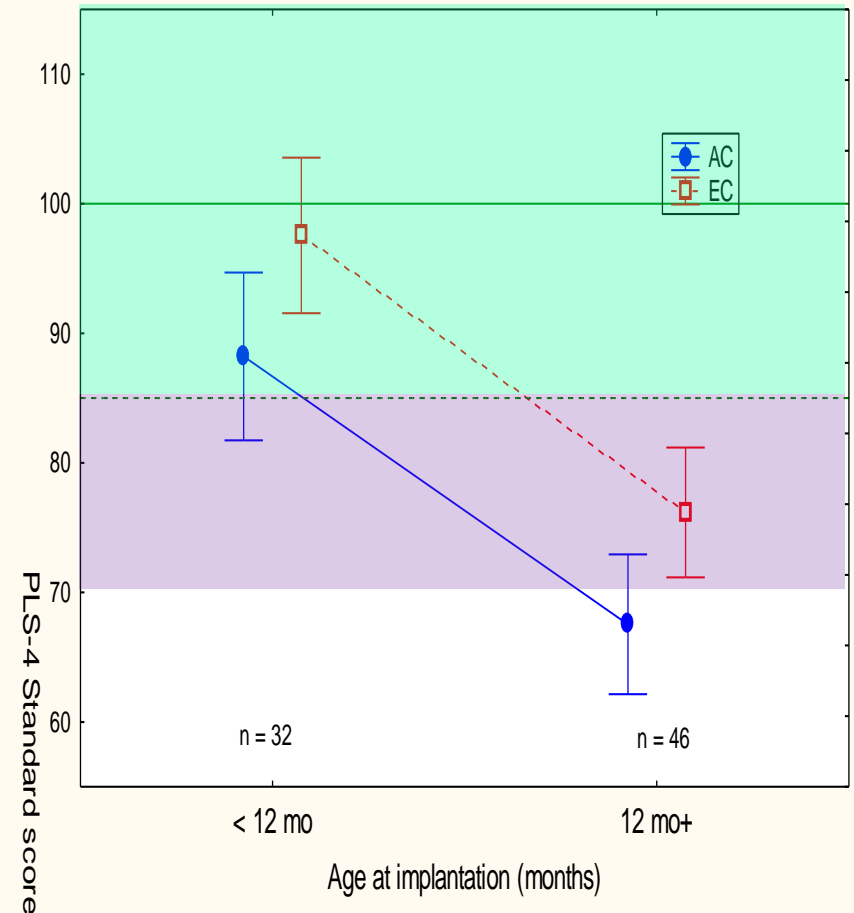
PLS-4 for Cochlear Implants

Age of implantation: $p < 0.0001$



6mths after switch-on (n=69)

Age of implantation: $p < 0.0001$

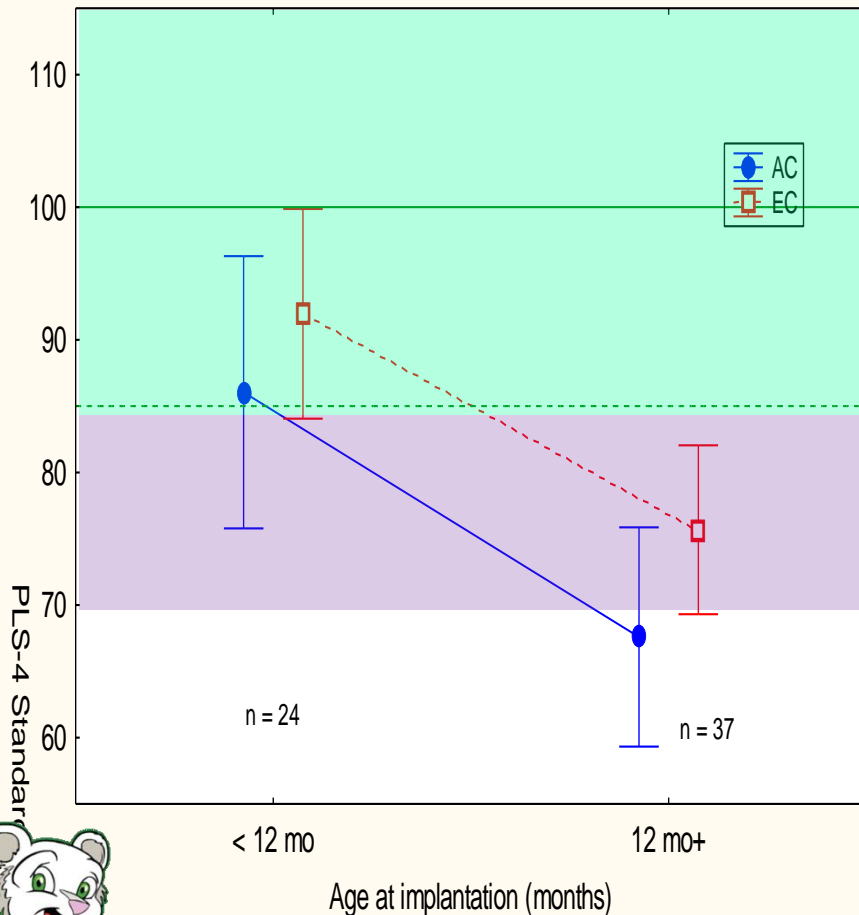


12mths after switch-on (n=78)



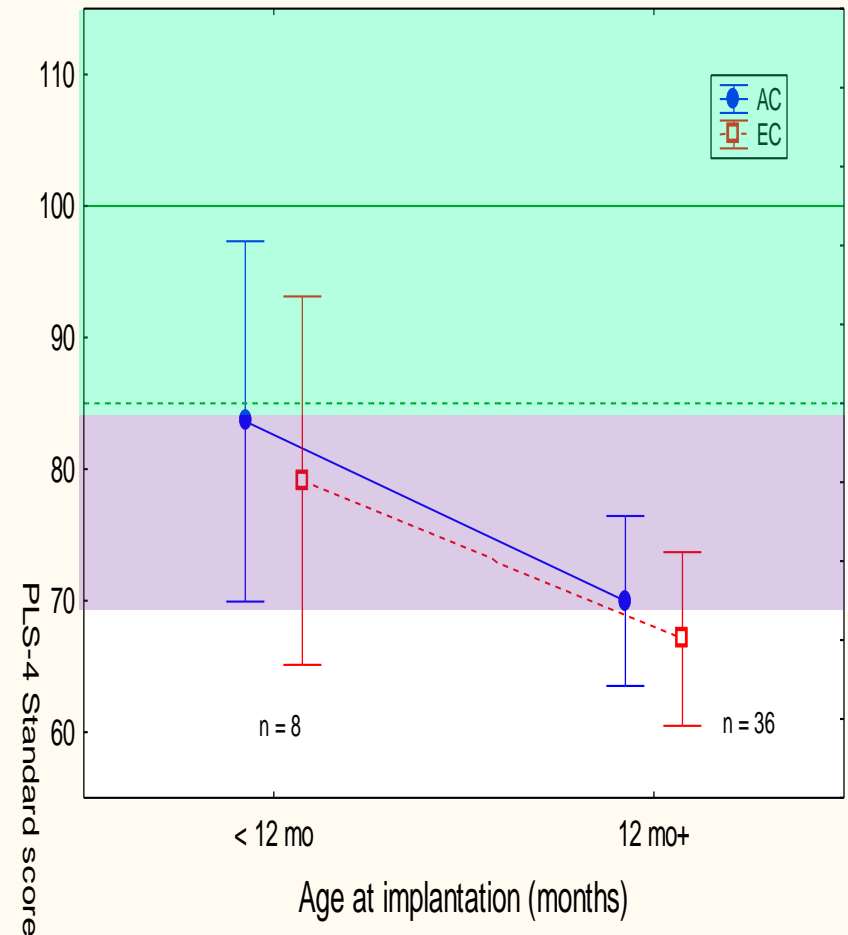
PLS-4 for Cochlear Implants

Age of implantation: $p < 0.004$



3yrs of age (n=64)

Age of implantation: $p = 0.09$



5yrs of age (n=44)



Interim Findings

Children with hearing aids

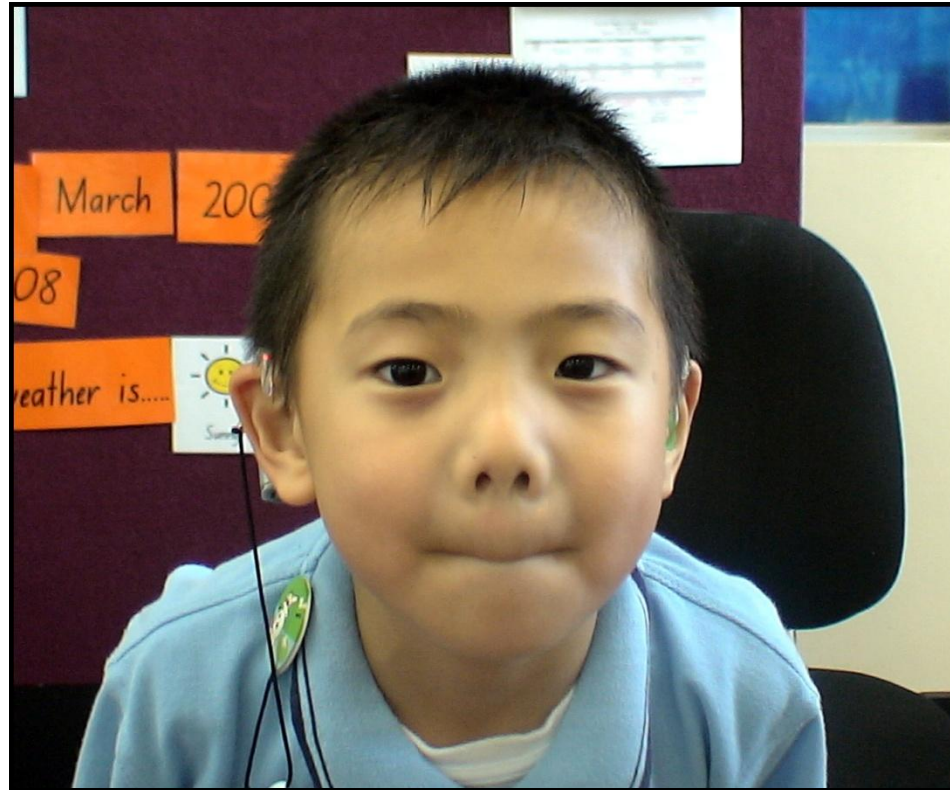
	6HA	12HA	3yrs	5yrs
Age of Fitting	✓	✓	✗	✗

Children with cochlear implants

	6HA	12HA	3yrs	5yrs
Age of Implantation	✓	✓	✓	✗



LOCHI Results - Summary



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www.outcomes.gov.au



Outcomes of Children with Hearing Impairment



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Hi, I'm LOCHI the lion from the Longitudinal Outcomes of Children with Hearing Impairment study. This study is conducted by the

National Acoustic Laboratories (NAL)

to examine the long-term speech, language, psychosocial and educational outcomes of children with hearing impairment. Children who wear hearing aids and/or cochlear implants are included.

[Click for info on Normative Sub-Study](#)

[Click here to view publications and presentations of the LOCHI study](#)

[New PEACH/TEACH rating scale](#)

[Aetiology Presentation by Henrik Dahl](#)



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