



Australian Government  
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# “How are you doing?”

**A cross-sectional follow up of children born with a unilateral hearing loss at primary school**

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## Children with unilateral hearing loss

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Despite early detection of congenital unilateral hearing loss (UHL) via universal newborn hearing screening (UNHS), there is a lack of evidence on the efficacy of fitting a device early in life for improving outcomes.

The benefit vs harms of early detection and treatment is uncertain.

Consequently, is it appropriate to fit devices early to children born with a unilateral hearing loss?

**Prospective study:**

Randomised controlled trial on device fitting  
Care program offered to all families  
Aetiology and outcomes

**Retrospective study:**

Child outcomes at school age

CUHL



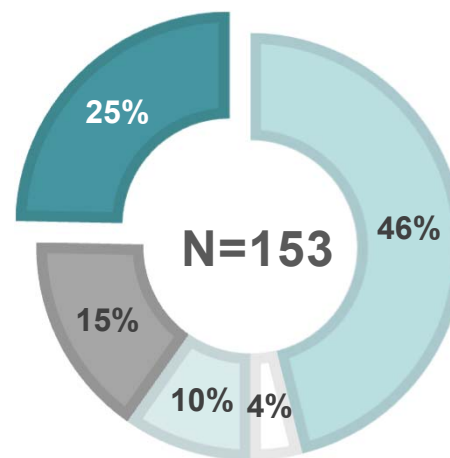
# Brief Literature Review

Source	Age	n	Sample	Speech	Language	Education	Psychosocial/ QoL	Comments
Ito (1998)	Uni students	305	Population			≈		
Bess et al (1998)	8-15 yrs	37	Population			✗	✗	
Kiese-Himmel (2002)	1-10 yrs	31	Clinical		≈			In <3yrs, No diff: +/- aiding
Borton (2010)	6-17 yrs	85	Clinical				≈	
Lieu et al (2010)	6-12 yrs	148	Population		✗	✗		
Briggs et al (2011)	7-12 yrs	8	Clinical	≈		≈		No diff: +/- aiding
Lieu et al (2012)	6-8 yrs	46	Population		≈			No diff: +/- aiding
Lieu (2013)	6-8 yrs	109	Clinical	✗		≈	✗ Aided children	NH siblings
Fitzpatrick et al (2018)	0-4 yrs	120 (38 UHL)	Clinical	≈	≈			No clear recommen dation for aiding

## Participants

- Children born between 2002 and 2007 in NSW whose diagnostic data were obtained for the LOCHI study, but who did not meet selection criteria for inclusion
- Children had various aetiologies and degrees of hearing loss
- N= 39 children, mean test age: 10;4 years (range: 9;0-12;7)

■ Uncontactable ■ Remote ■ Declined ■ No response ■ Recruited for CUHL



## **Audiology**

Masked audiogram and tympanometry for both ears within 6 months of assessment

Speech perception measures (BEST sentences and VCV)

PEACH

## **Speech and Language**

Peabody Picture Vocabulary Test- 4 (PPVT4)

Clinical Evaluation of Language Fundamentals – 4th Edition (CELF-4)

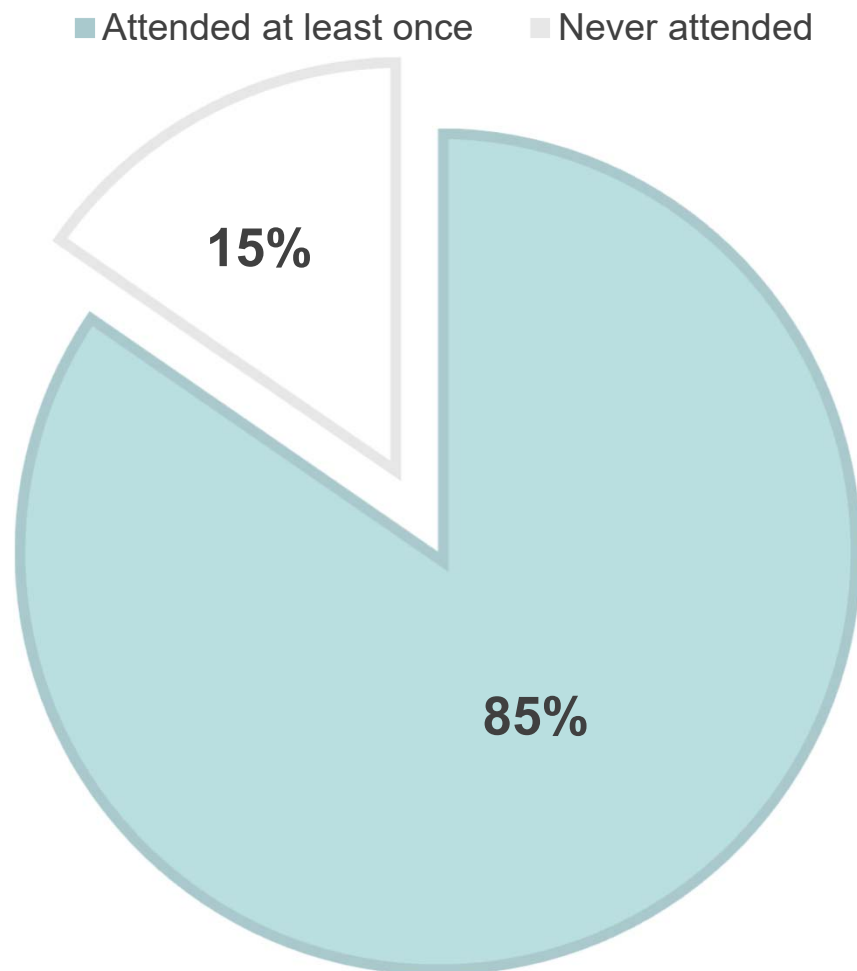
Woodcock Diagnostic Reading Battery (WDRB)

## **Demographic data**

*Age of assessment: 9;0-12;7years*

# Retrospective Study- Audiological History

## Accessed Australian Hearing services:



## Average age at:

### Diagnosis:

**0;2 years**  
(13 days - 9.6 months)



## First Australian Hearing appointment:

**2;7 years**  
(0;6 years - 8;2 years)



## First device fitting:

**4;5 years**  
(0;10 years - 8;4 years)



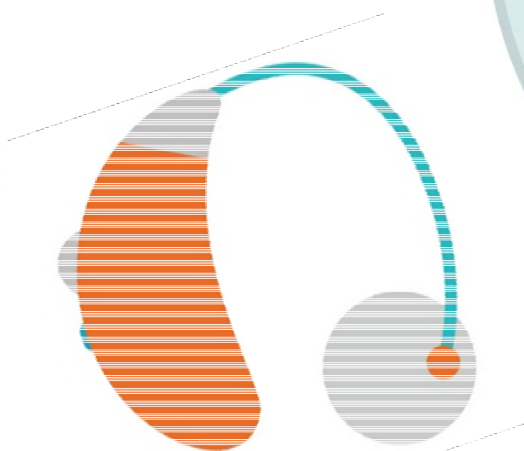
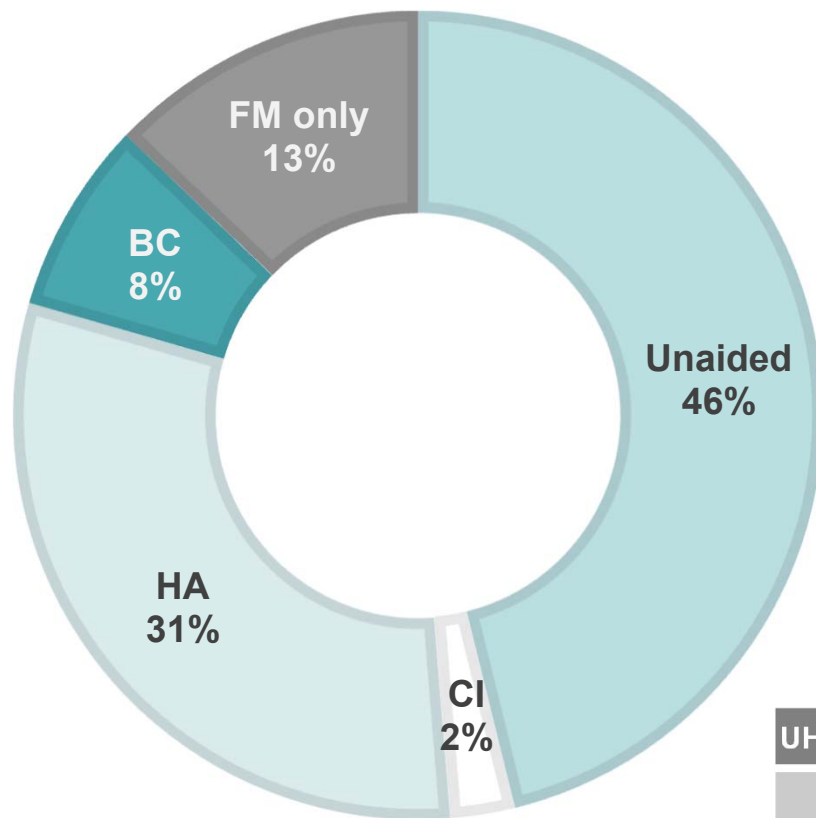
# Retrospective Study- Hearing Loss Evolution



Diagnosis (13days-9.6months)	CUHL Assessment (9;0-12;7years)						
	Normal	Mild [25-40]	Moderate [41-60]	Severe [61- 80]	Profound [>81]	Did not test	Total
Normal	0						0
Mild	5	5		2			12
Moderate		4	3	4	4		15
Severe			1	1	6		8
Profound				3			3
Did not test				1 (atresia)			1
Total							39



## CURRENT DEVICE FITTING



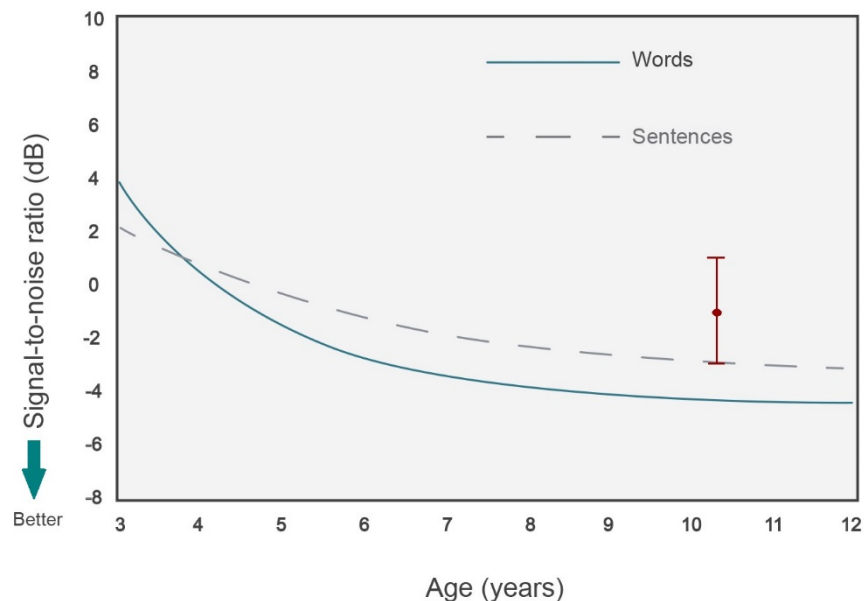
UHL Diagnosis	Current Device	
39	18	Unaided (includes 5 NH)
	17	Unilateral
	4	Bilateral

## BEST sentence test results

Average SRTs for  $S_0N_0$  **-0.9 dB** (SD 1.8)

Average SRTs for  $S_0N_{90}$  **-1.4 dB** (SD 4.4)

Mean SRMs was **0.4 dB** (SD 3.5)



**Compared to normal-hearing children, no masking release was observed in children with unilateral hearing loss**

**On average, children with a unilateral hearing loss are performing approximately 3dB worse than their normal-hearing peers**

## PEACH results (n= 27)

<b>PEACH Total score</b>	<b>78.4%</b>
PEACH Quiet score	84.3%
PEACH Noise score	71.3%
Usage score	51-75% (n=13)

## SELF results (n= 31)

<b>SELF Total score</b>	<b>84.8%</b>
SELF Quiet score	85%
SELF Noise score	84.7%
Usage score	51-75% (n=18)



**Parents report that children with a unilateral hearing loss have more issues in noise**

**Children fitted with a device will use it more than 50% of the time**

**Hearing levels can change for better or worse depending on aetiology and unilateral hearing loss can progress to a bilateral loss  $\approx$  10% in this sample**

**Changes in management pathway of children born with a unilateral loss**

### **Limitations:**

Late fitting vs early fitting

*- Average age of fitting: 4;5 years*

Cannot evaluate effectiveness of fitting and outcomes

*- 15% never accessed Australian Hearing services*

*- 17/39 children had additional disabilities and were mostly fitted*

## CUHL Study- What's Happening?

Investigating whether fitting a device early will impact outcomes of children born with a unilateral loss in the CUHL- Prospective study.

Investigating the impact and decision-making process of fitting/not with families and audiologists.

Data collection is ongoing and will continue until 2020. Currently we are halfway through data collection for CUHL-Prospective study.

CUHL

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