

# REVIEW OF OUTCOMES OF CHILDREN WITH DESIGNATED ADDITIONAL NEEDS RECEIVING COCHLEAR IMPLANTATION



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## 1. Aims

A review of the outcomes of children with additional needs receiving cochlear implantation (CI) at the Yorkshire Auditory Implant Service (YAIS)

## 2. Introduction

Cochlear implants (CIs) are recognised as a clinically and cost-effective method in the management of children with severe to profound deafness (1). However, the impact of CIs in children with additional needs (ANs) is less clear(2,3,4).

Research has consistently shown that earlier implantation is associated with superior audiological and communication outcomes in children without ANs.(1,5) However, there is currently limited research regarding the significance of age of implantation in children with ANs.

## 3. Methodology

**Subjects:** From prospectively collected data, 270 children who received cochlear implants at YAIS between 2007 and 2017 were included in this study. 49 of these children were classified as having additional needs. 18 were implanted <2 years and 31 >2 years; comparative group of children without additional needs 221 ; 85 implanted <2 and 136 >2 years.

**Outcome Measures:** The audiological performance scales used were the Meaningful Auditory Information Scale (MAIS), Listening Progress score (LIP), Categories of Auditory Performance (CAP) and communicational scales were Speech Intelligibility Rating (SIR) and Meaningful Use of Speech Scale (MUSS), which were analysed pre- and 12 months post implantation.

## 4. Statistical Analysis:

Outcome measures pre- and post were compared between the two groups using independent samples T-tests.

Score changes (i.e. 12 months post scores subtracted by pre-scores) were also compared using independent samples T-test.

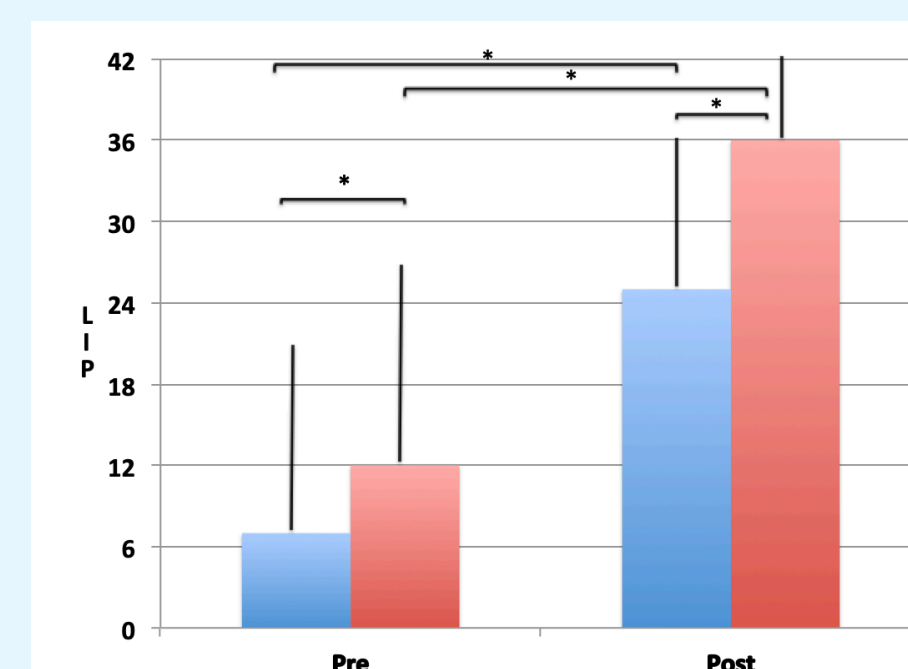
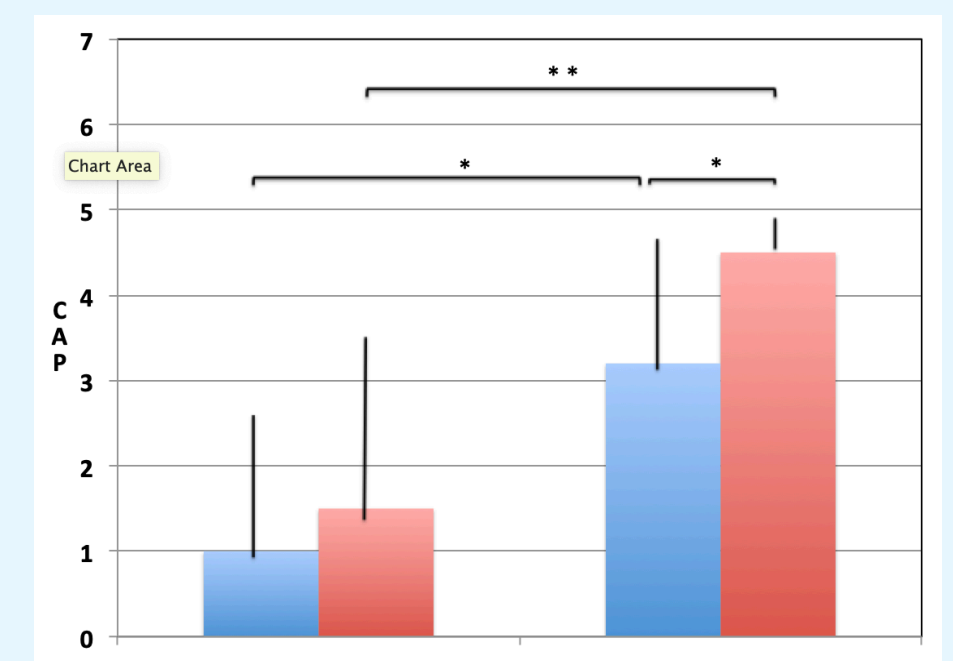
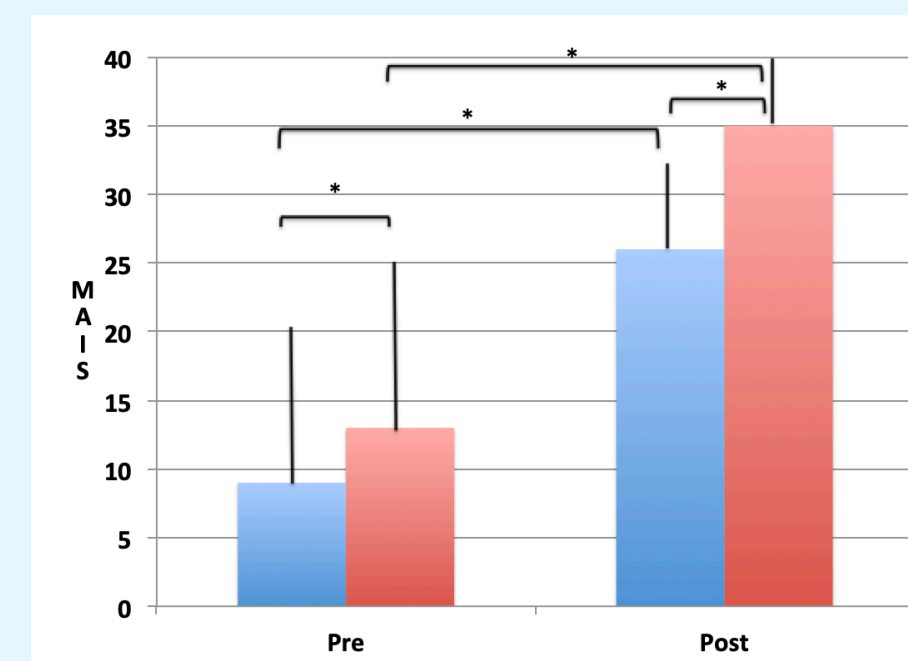
For age, outcome measures scores and rates of improvement were compared between children implanted under and over the age of 2 years with and without ANs



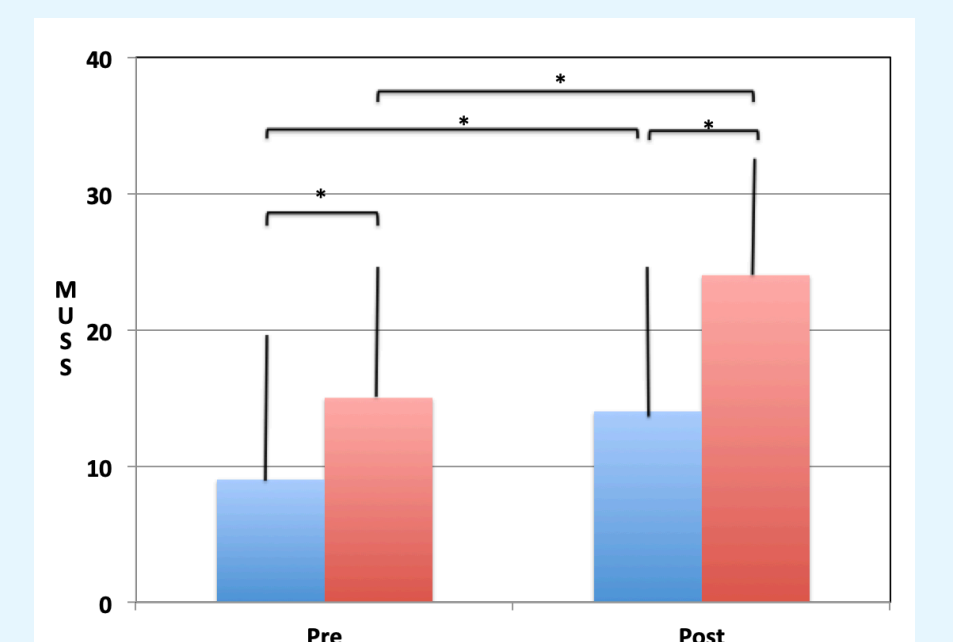
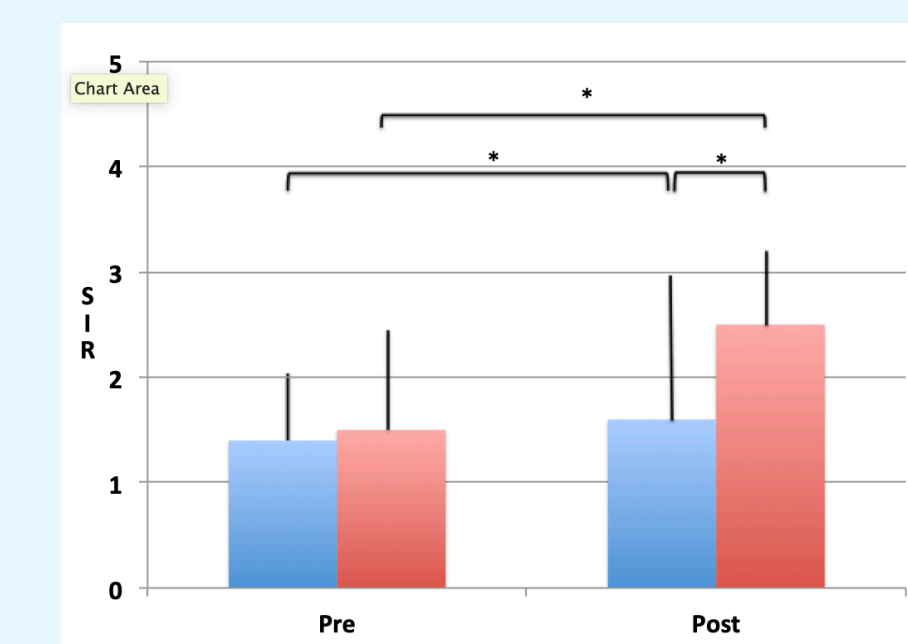
## 5. Results

The outcome of improvement in all measures was statistically significantly lower in children with ANs compared to children without.

- Twelve months post-implantation, children with ANs improved across all outcome measures (CAP from 1.06 to 3.2; MAIS from 9.22 to 25.92; MUSS from 9.43 to 14.49; LIP from 7.83 to 25.24; SIR from 1.34 to 1.51)
- The improvement in MAIS, LIP, MUSS, SIR and CAP scores was greater in children without ANs implanted < 2 compared to those implanted > 2. [CAP  $p < 0.001$ ]
- In children with ANs, there was no significant difference in the rate of improvement in all measures, across both age groups.



Pre- & 12-month post-implantation outcome measure scores for children with additional needs (blue) and without additional needs (red). Values are reported as means  $\pm$  SD. (\*  $p \leq 0.05$  \*\*  $p \leq 0.001$ ).



## 4. Conclusions

- All children were able to gain access to sound following CI.
- There were improvements seen in all outcome measures for both groups.
- The greatest improvements were with MAIS, CAP & LIP [auditory measures] with enhancement in environmental & family interactions. Development of oral communication [MUSS & SIR] was poorer in children with AN's. This review was only for 12 months - longer review is planned.
- Earlier implantation was associated with greater improvements in all areas in children without ANs.
- The rate of improvement was statistically significantly lower in children with ANs
- In children with ANs, the findings suggest that earlier implantation may be a less significant factor & therefore other clinical issues may be prioritised.

## References

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