Cochlear implant outcomes for older adults

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Overview of the RVEEH Cochlear Implant Clinic

- Assist people who have a significant hearing loss in finding suitable options for improving their hearing
- Suitable options may include cochlear implants (CI), bone conduction implants, middle ear surgery etc.
- Established in 1982 following the successful research trial the multichannel cochlear implant by Graeme Clark and his team
- Provide ongoing support to 3500+ CI recipients
- Multidisciplinary team; ENT surgeons, Audiologists & Speech Pathologists
- Services provided through public and private funding options
- Strong focus on research and evidence-based practice

How is a CI recommendation made?

- Evaluation for cochlear implant
  - comprehensive case history, including motivation and social support
  - assessment hearing and communication
    - type and degree of hearing loss
    - aided speech perception
    - hearing related quality of life
  - vestibular function (if warranted)
  - anatomy and health of ears
  - general health and development
- Results considered by multi-disciplinary team
- Recommendation given to patient/family

Audiological guidelines for recommending CI

Consider option of cochlear implantation for adults if:

POST-LINGUAL hearing loss

- Moderate-to-severe hearing loss or worse
- 55% or worse aided phoneme score in worse hearing ear

PRE-LINGUAL hearing loss

- Moderate-to-severe hearing loss or worse
- Evidence that auditory cues assist communication

Medical & developmental guidelines

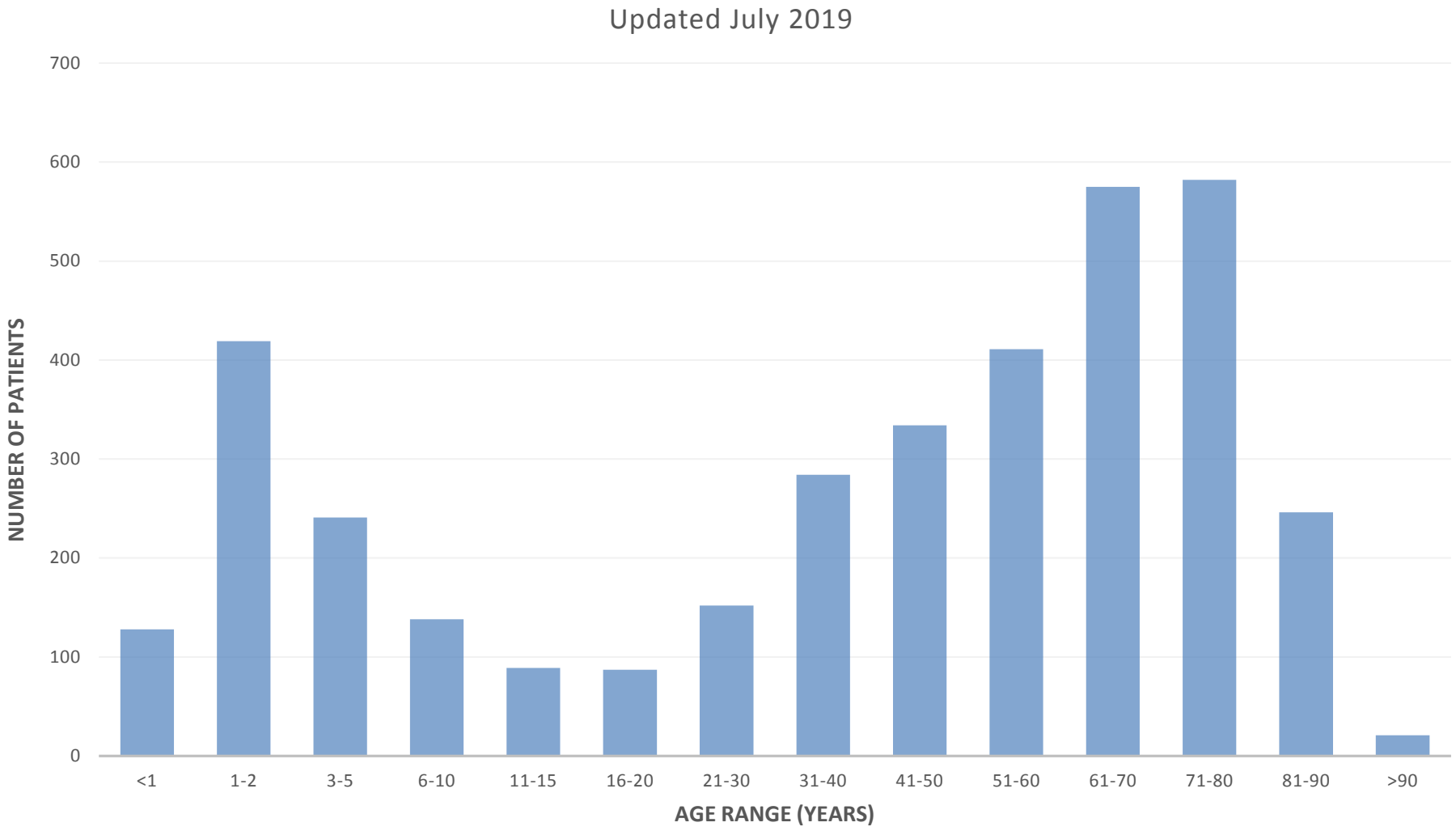
Consider option of cochlear implantation for people if:

- Evidence that an auditory nerve is accessible by an implant
- The surgical procedure can be performed with minimal risk to the patient
- Evidence that the patient has sufficient cognitive ability that they can respond to external stimuli

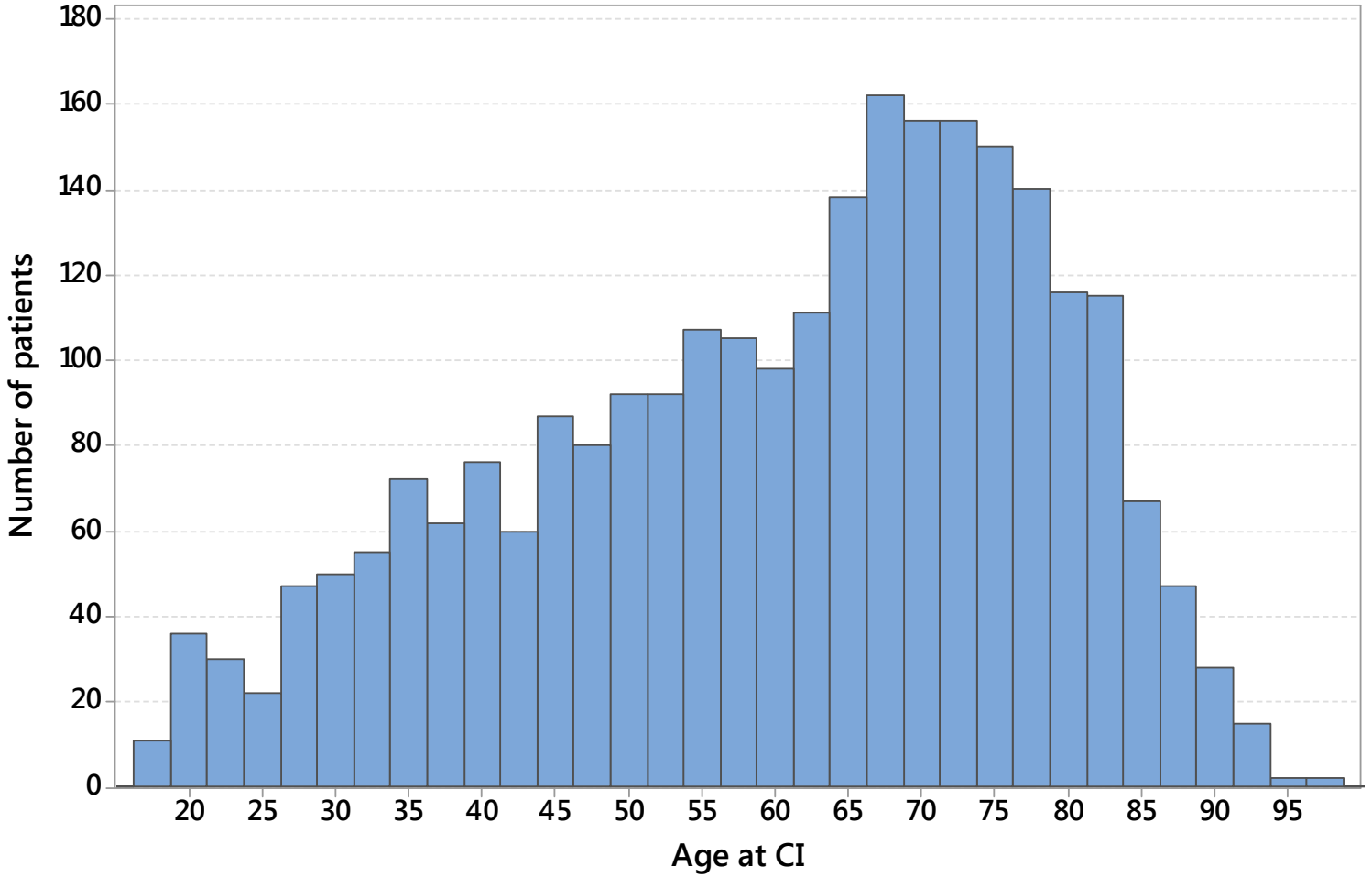
How we measure CI outcome

- Speech perception assessment
  - Audition alone unilateral CI performance
  - Audition alone binaural condition
  - Monosyllabic words in quiet
  - Sentences in adaptive noise (SRT)
- Quality of Life
- Satisfaction with outcome

Age range of CI recipients



Age at CI for adults



Highlights from consensus statements

- Consensus on standard of care in CI treatment for adults
  - Age alone should not be a limiting factor to cochlear implant candidacy, as positive speech recognition and quality of life outcomes are experienced by older adults as well as younger adults
  - Adults who are eligible for cochlear implants should receive the implant as soon as possible to maximize post-implantation speech recognition

Background

- Factors shown to affect cochlear implant outcome in adults*
  - Duration of severe-to-profound hearing loss prior to CI
  - Age at onset of bilateral hearing loss (i.e. prelingual vs postlingual onset)
  - **Age at cochlear implant**
  - Pre-implant residual hearing
  - Hearing aid use

*Blamey et al, 2013; Dowell, 2012

Aim of the study

- Evaluate the speech perception outcomes after cochlear implantation for older adults with post-lingual hearing loss
- Compare the speech perception outcome for different age groups

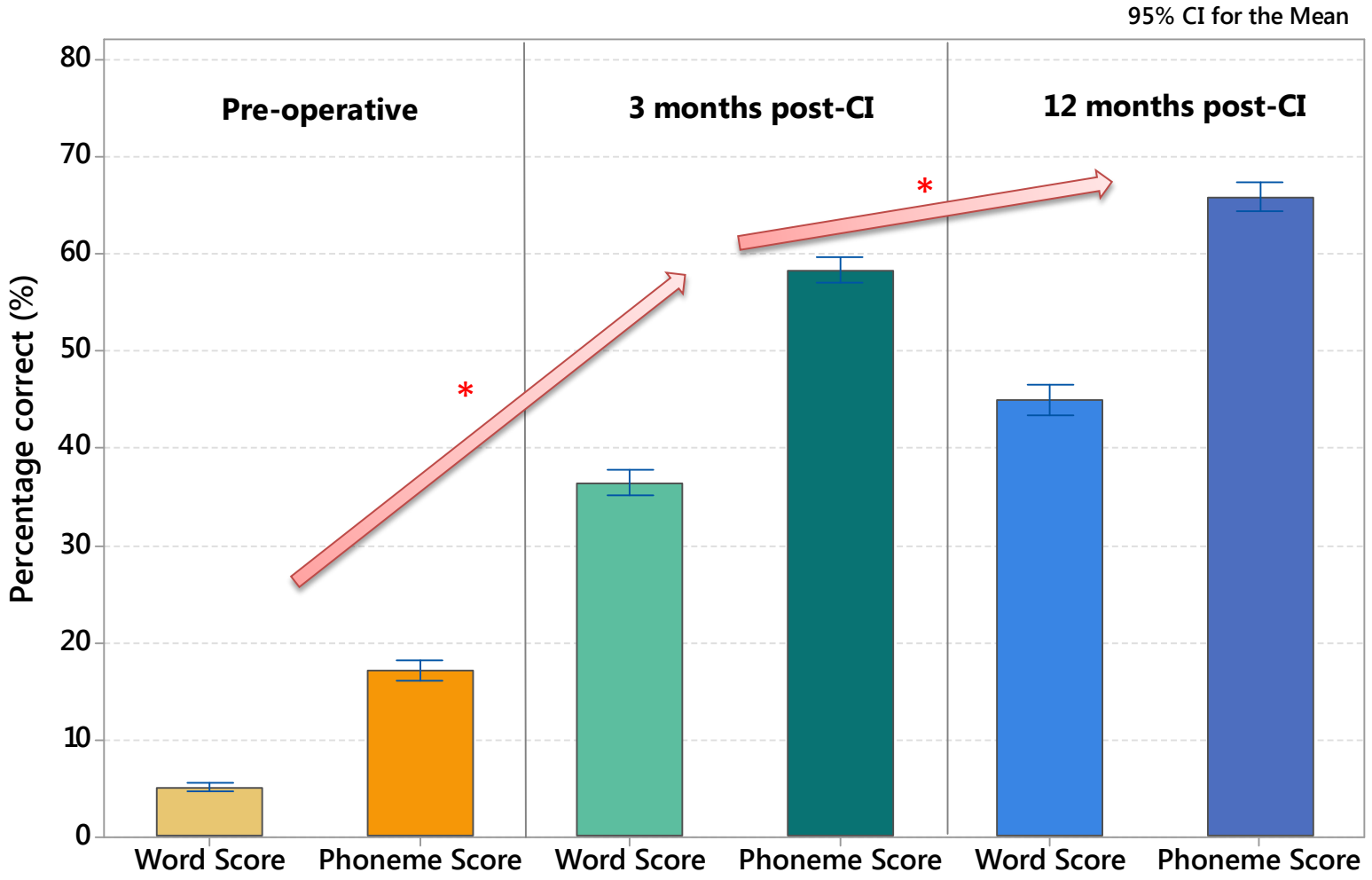
Participants and method

- Adults with post-lingual onset of hearing loss who received a CI at RVEEH between 2001 and 2019 (N=1504)
- Assessed using a monosyllabic word test, aided in quiet

Group	N	Mean Age at CI (years)	Pre-operative aided speech perception scores				Duration of binaural ≥severe hearing loss (years)
			Ear to be implanted		Best Score		
			Words	Phonemes	Word	Phoneme	
All	1504	66	5% *(0-60)*	17% *(0-76)*	24% *(0-100)*	44% *(0-100)*	12.4 *(0-70)*
(1) CI <50yrs	225	38	4% *(0-40)*	13% *(0-61)*	20% *(0-100)*	35% *(0-100)*	10.7 *(0-50)*
(2) CI 50-64yrs	356	57	5% *(0-46)*	17% *(0-72)*	25% *(0-100)*	43% *(0-100)*	12.0 *(0-60)*
(3) CI 65-74yrs	457	70	5% *(0-60)*	17% *(0-76)*	28% *(0-100)*	48% *(0-100)*	12.0 *(0-70)*
(4) CI ≥75yrs	466	81	6% *(0-50)*	18% *(0-74)*	23% *(0-95)*	44% *(0-97)*	13.8 *(0-70)*

*mean (range)

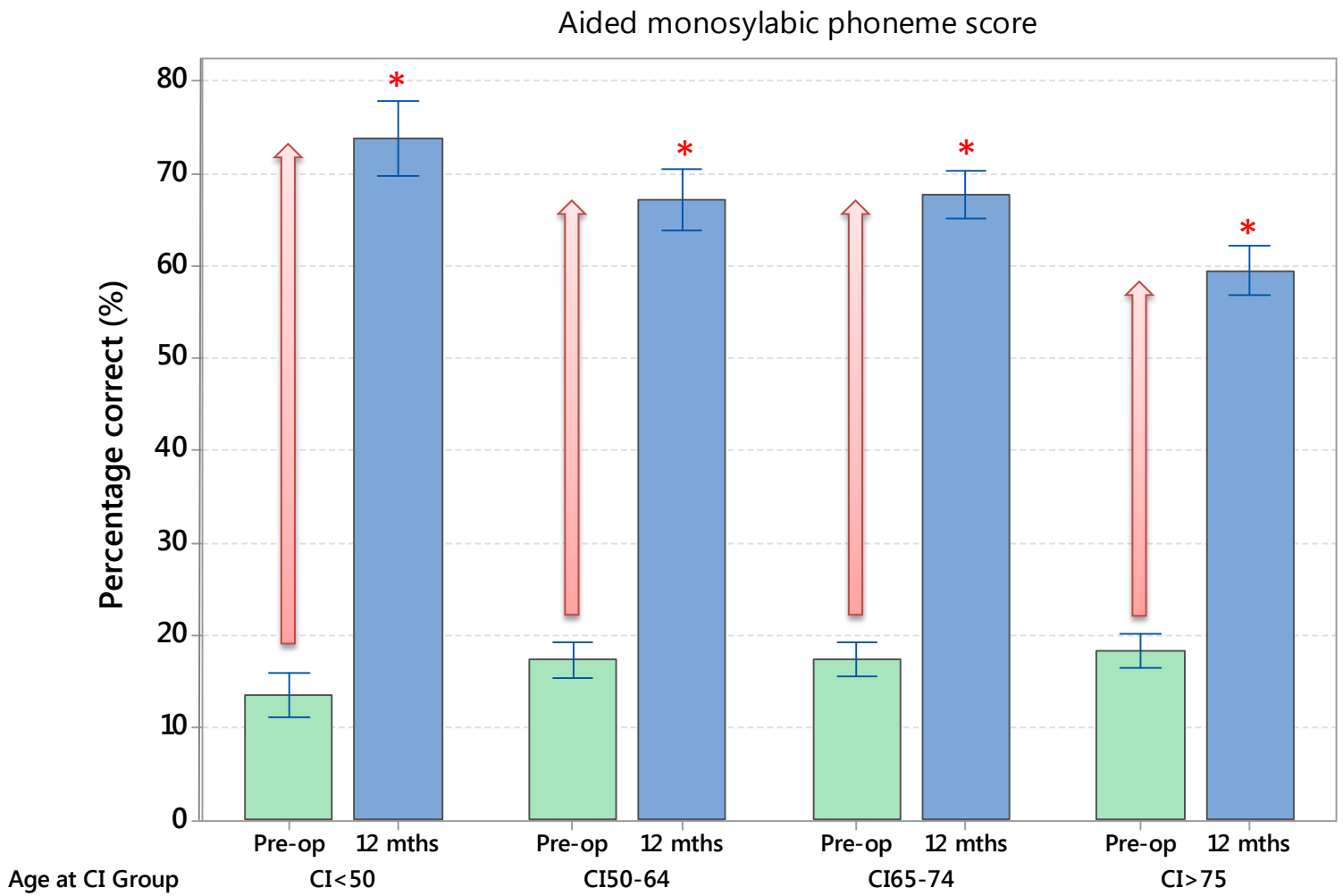
Results: Speech perception score for all patients



* significant p<0.05

N = 1504

Results: Speech perception benefit by age group



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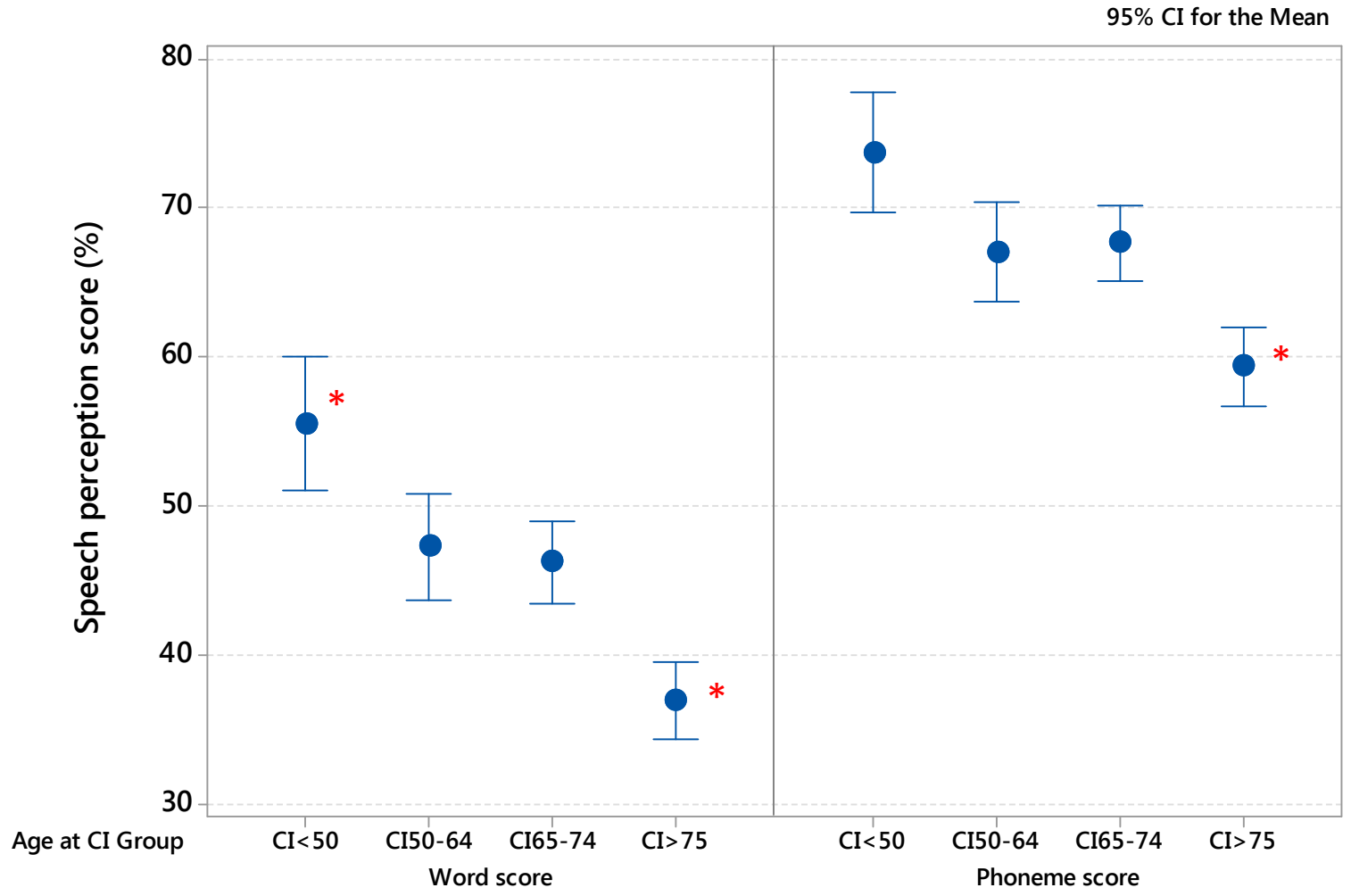
Results: Speech perception outcome by age group



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N = 1504

Summary

- Cochlear implant provides significant improvement in speech perception outcome for adults with post-lingual hearing loss of all ages
- Average improvement in score for CI ear ranged from 42-60% for the age groups
- Those who received CI<50 year achieved the greatest post-operative benefit on speech perception testing
- Those who receive CI between 65-74 years of age achieve equivalent speech perception performance to those who receive a CI at a younger age
- While those who received CI>75yrs performed poorer on average compared to all other groups, they showed a significant post-operative improvement

Considerations for older adults

- Family support
- Social isolation
- Medical complications, including balance
- Cognitive status

Conclusion

- Earlier the better but later is better than never…
- Funding is not a barrier to access to CI in Australia

Feel free to get in touch

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