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# CIICA

## CI for older people

## What do we know?

June 26<sup>th</sup> 2025

Clinical Professor Catherine Birman OAM

MBBS PhD FRACS

# CI for older people

## What do we know?

- Background
- Am I too old ?
- Should I wait for my hearing to drop further ?
- It is not just about hearing





A woman with short blonde hair, wearing a light-colored straw hat and a bright green short-sleeved button-down shirt, is sitting on a dark wooden park bench. She is smiling and looking upwards while holding a black mobile phone to her ear. A green bag is resting on the bench next to her. The background is a lush green park with trees and bushes, and a tree trunk is visible to the right. The text "Cochlear implants are indicated when hearing aids are not enough" is overlaid on the left side of the image in a white, typewriter-style font.

Cochlear implants  
are indicated when  
hearing aids are not  
enough



Clinical Review & Education

JAMA Otolaryngology-Head & Neck Surgery | Review

Unilateral Cochlear Implants for Severe, Profound, or Moderate Sloping to Profound Bilateral Sensorineural Hearing Loss  
A Systematic Review and Consensus Statements

Craig A. Buchman, MD; René H. Gifford, PhD; David S. Haynes, MD; Thomas Lenarz, MD; Gerard O'Donoghue; Oliver Adunka, MD; Allison Biever, AuD; Robert J. Briggs; Matthew L. Carlson, MD; Pu Dai, MD; Colin L. Driscoll, MD; Howard W. Francis, MD; Bruce J. Gantz, MD; Richard K. Gurgel, MD; Marlan R. Hansen, MD; Meredith Holcomb, AuD; Eva Karltorp, MD; Milind Kirtane, MS ENT; Jannine Larky, AuD; Emmanuel A. M. Mylanus, MD; J. Thomas Roland Jr, MD; Shakeel R. Saeed, MD; Henryk Skarzynski, MD; Piotr H. Skarzynski, MD; Mark Syms, MD; Holly Teagle, AuD; Paul H. Van de Heyning, MD; Christophe Vincent, MD; Hao Wu, MD; Tatsuya Yamasoba, MD; Terry Zwolan, PhD

LIVING GUIDELINES V3.0

SUMMARY OF RECOMMENDATIONS AND  
GOOD PRACTICE STATEMENTS

JULY 2024



CI Users, family members and clinical teams

Person centred care

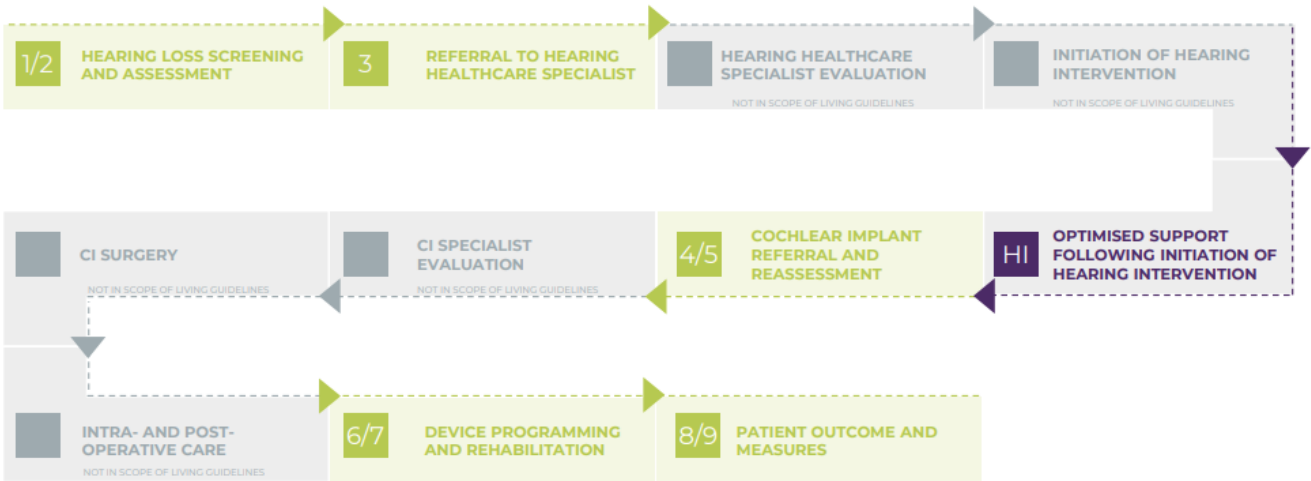
Cochlear Implant International Community of Action (CIICA)  
[www.ciicanet.org](http://www.ciicanet.org)

CIICA'S GOAL: To increase the number of people globally who have access to cochlear implants and lifelong aftercare by supporting CI advocates with the tools they need to achieve change.



LIVING GUIDELINES CONSIDERATIONS

The Living Guidelines considers a patients journey from **hearing loss screening, to support following initiation of hearing interventions, to cochlear implantation then rehabilitation.**



# With hearing aids on:

*Do you find it difficult to hear on the phone?*

*Are you no longer able to hear children's voices clearly?*

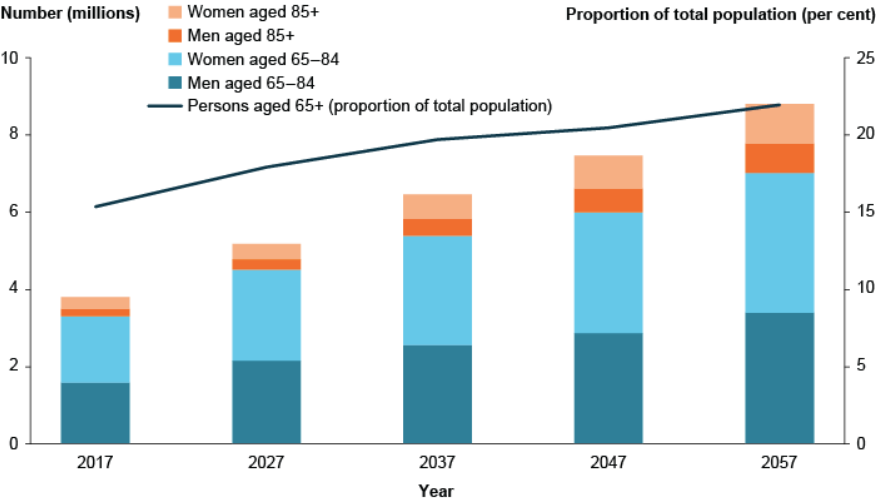
*Do you struggle to hear in crowded places?*

If you answer **YES** to one or more of these questions, you may benefit from a cochlear implant.



# Australian life expectancy and seniors

Number and proportion of the population aged 65 and over, by age group and sex, 30 June 2017, 2027, 2037, 2047 and 2057



4.3 million ≥ 65 years  
(16.9% of the population)

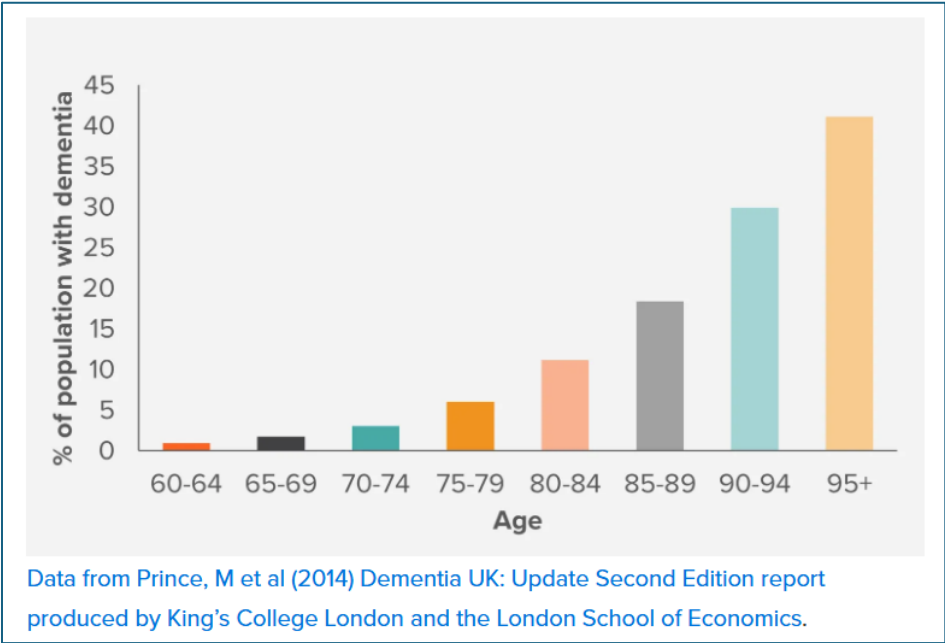


Table 1.9 Life Tables, Australia, 2019-2021		
	Males	Females
	ex	ex
Age	years	years
64	21.16473	23.85508
65	20.34765	22.97584
66	19.53755	22.10178
67	18.73473	21.23306
68	17.93977	20.3709
69	17.15375	19.516
70	16.37766	18.67009
71	15.61237	17.83426
72	14.85858	17.00867
73	14.11707	16.19442
74	13.38839	15.39239
75	12.67336	14.60333
76	11.97328	13.82751
77	11.28954	13.06479
78	10.62338	12.31628
79	9.97646	11.5843
80	9.35033	10.87199
81	8.74605	10.18096
82	8.1642	9.51328
83	7.60525	8.86963
84	7.06998	8.25102
85	6.55944	7.65816
86	6.0745	7.09207
87	5.61595	6.55457
88	5.18477	6.04649
89	4.78267	5.56845
90	4.41196	5.12246
91	4.07411	4.71008
92	3.77002	4.33288
93	3.49956	3.99007
94	3.26102	3.68286
95	3.05133	3.41557



Nearly  
1 in 3

people over 65 years old is  
affected by hearing loss<sup>3</sup>



# CI for older people

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## Cochlear Implant Adult Speech Perception Outcomes: Seniors Have Similar Good Outcomes

\*†‡§Catherine S. Birman and \*Rachelle T. Hassarati

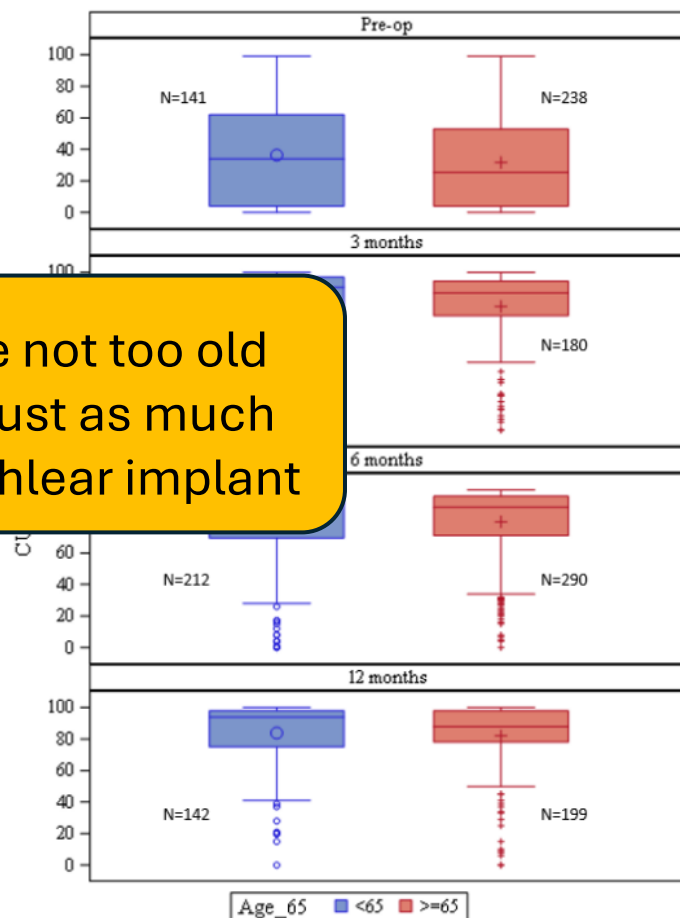
**CUNY sentences** <65 years vs ≥ 65 years P=0.12

N= 785

Adults receiving a CI under the age of 65 years v 65 years and over

**CNC words** <65 years vs ≥ 65 years p=0.69

No, you are not too old to benefit just as much from a cochlear implant

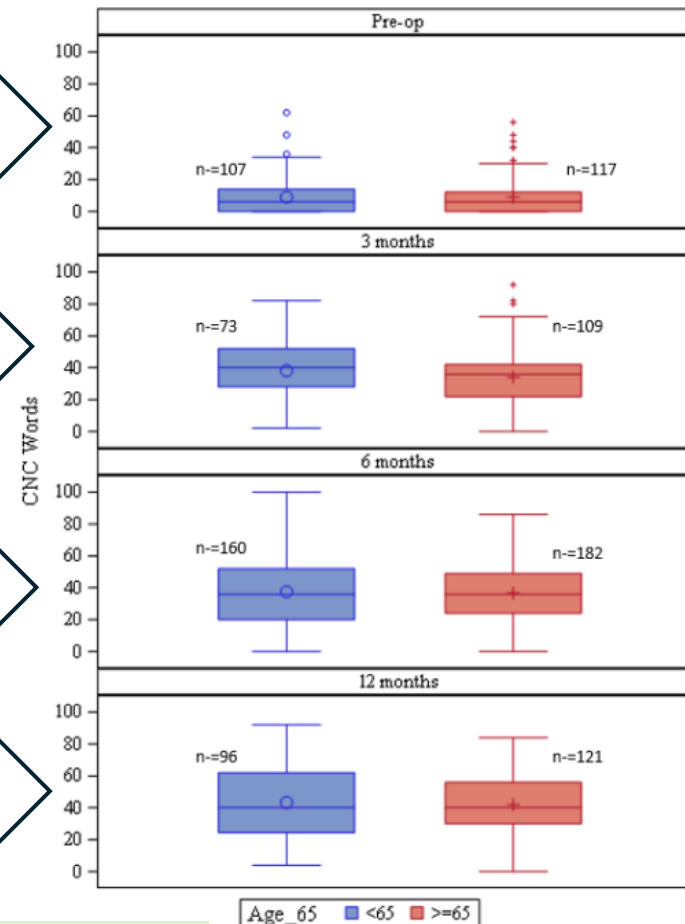


Preoperative

@ 3 months

@ 6 months

@ 12 months



No significant difference

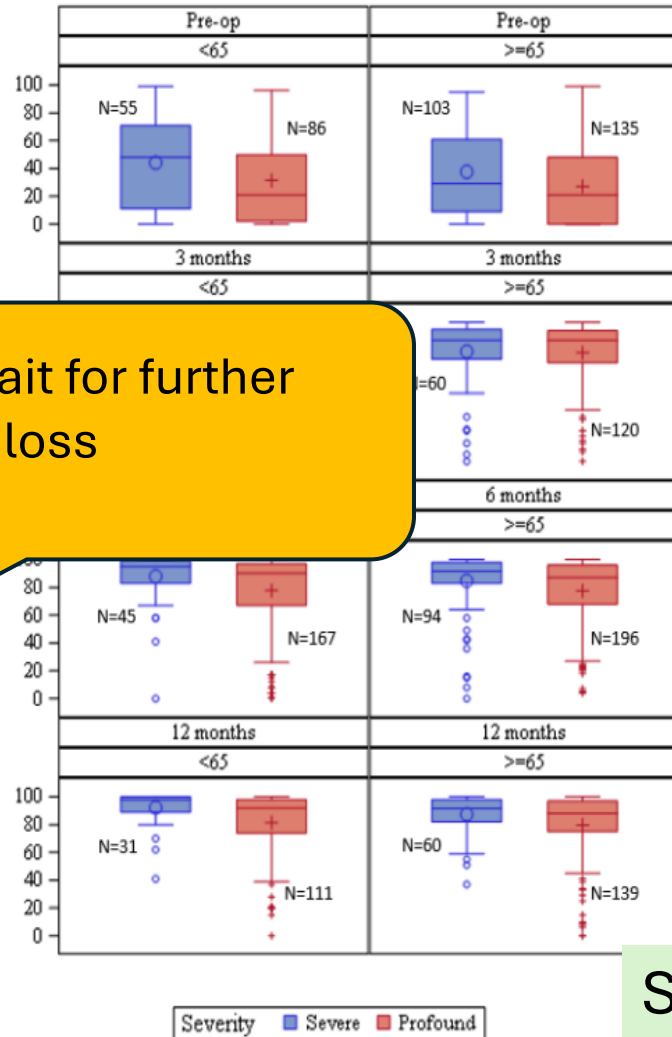


# Significantly poorer outcomes, in both age groups, with preoperative profound vs severe hearing loss

CUNY sentences **severe** vs **profound**  $p < 0.001$

<65 years

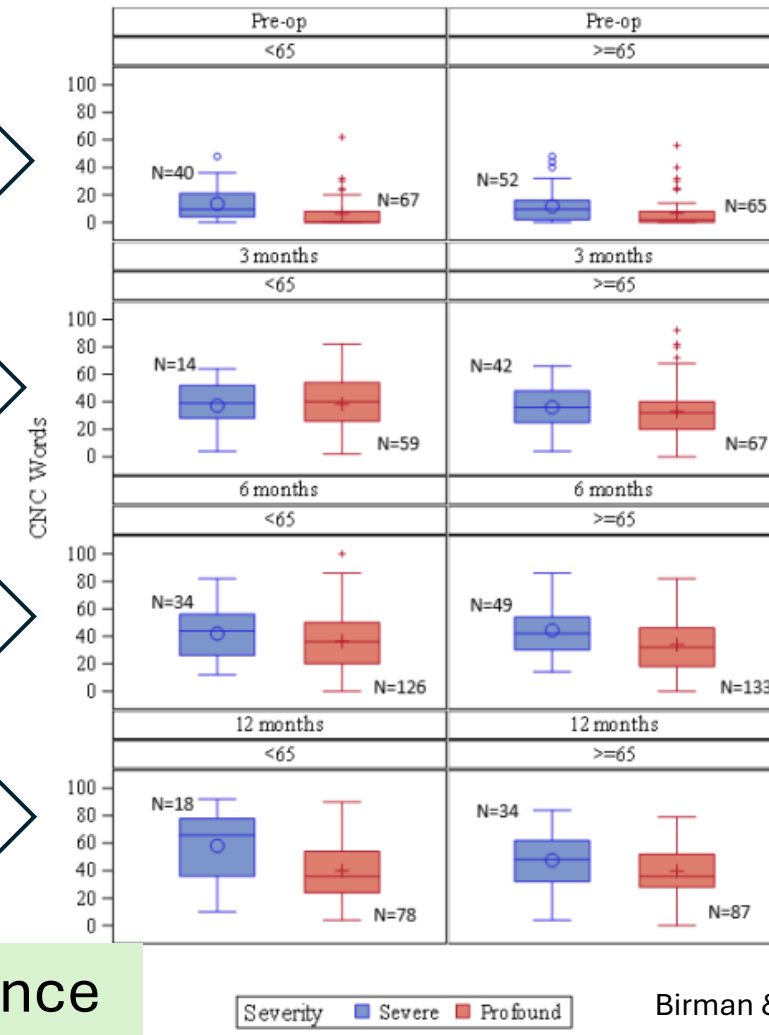
≥65 years



CNC words **severe** vs **profound**  $p < 0.0001$

<65 years

≥65 years



N-785

Preoperative

@ 3 months

@ 6 months

@ 12 months

CNC Words

Significant difference

Don't wait for further hearing loss

# Adult timing

**On average adult CI recipients  
have been a CI candidate for over 12  
years<sup>1</sup>, prior to surgery**

1. Balkany et al 2007





# CI for older people

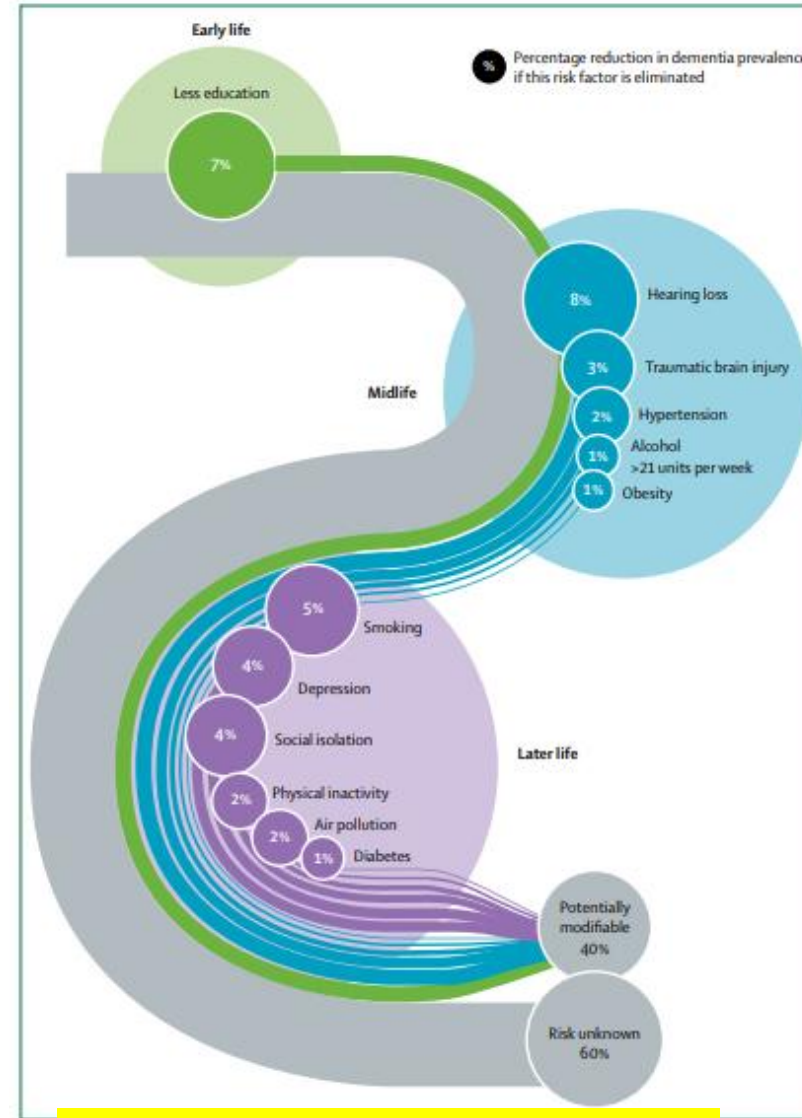
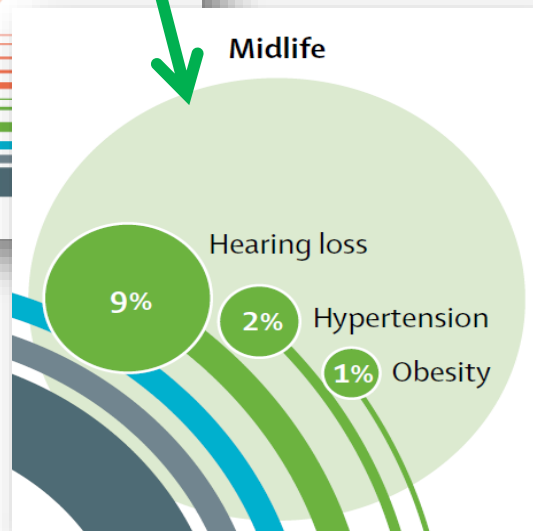
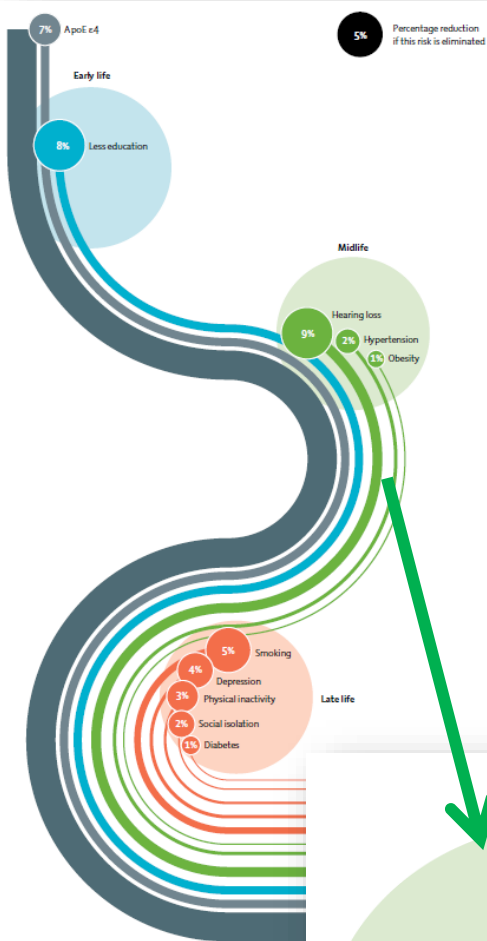
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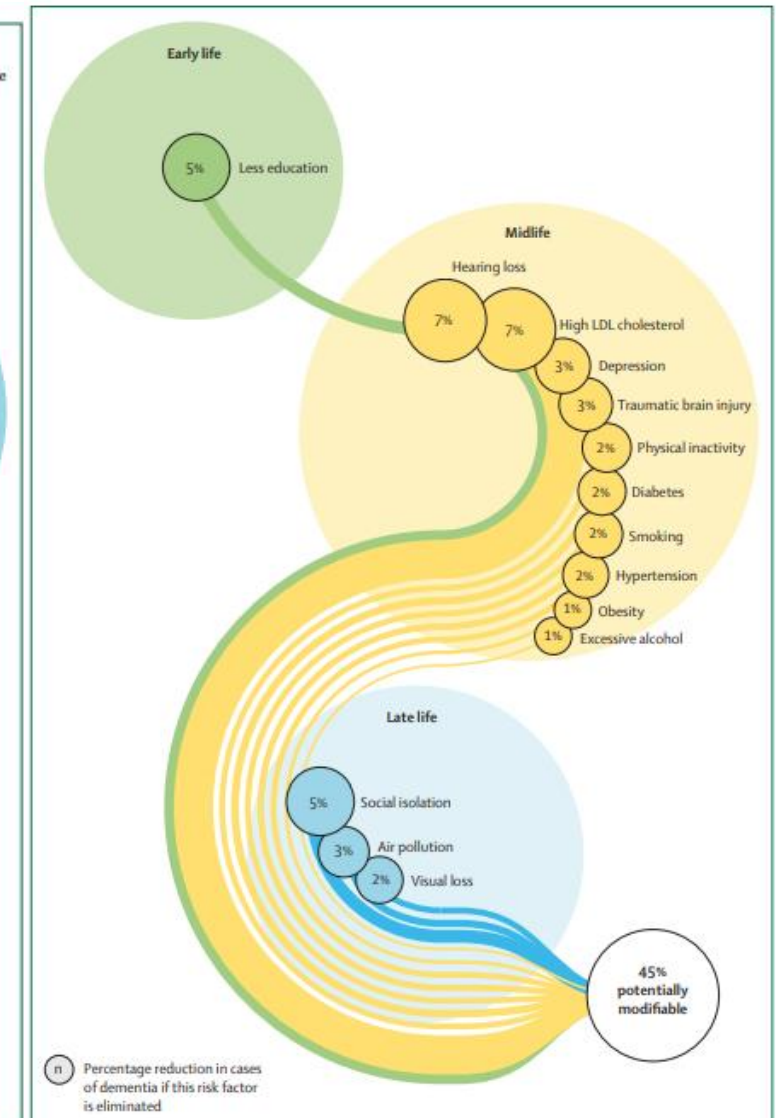




# Hearing loss- largest single modifiable risk factor for dementia



Livingstone G B, et al **Lancet** 2020



Livingstone G B, et al **Lancet** 2024

# Hearing Loss and Incident Dementia

Frank R. Lin, MD, PhD; E. Jeffrey Metter, MD; Richard J. O'Brien, MD, PhD;  
Susan M. Resnick, PhD; Alan B. Zonderman, PhD; Luigi Ferrucci, MD, PhD

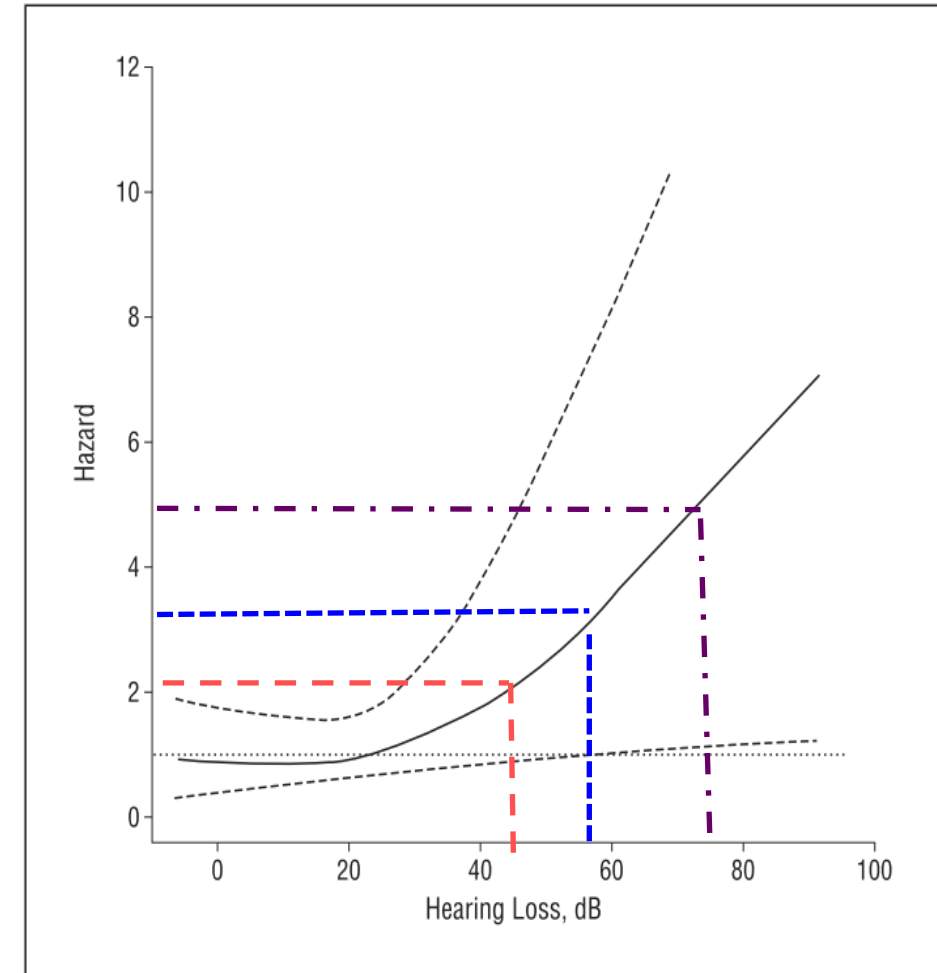
Baltimore longitudinal study n=639

(dementia free in 1990-94)

- 4FPTA, median follow up 11.9 years until dementia diagnosis



Risk of developing dementia over approximately 10 years

- Mild HL → 2X
- Moderate HL → 3X
- Severe and profound HL → 5X



**Figure 2.** Risk of incident all-cause dementia by baseline hearing loss after adjustment for age, sex, race, education, diabetes mellitus, smoking, and hypertension. Hearing loss is defined by the pure-tone average of thresholds at 0.5, 1, 2, and 4 kHz in the better-hearing ear. Upper and lower dashed lines correspond to the 95% confidence interval. *Arch Neurol.* 2011;68(2):214-220. doi:10.1001/archneurol.2010.261

## Hearing intervention versus health education control to reduce cognitive decline in older adults with hearing loss in the USA (ACHIEVE): a multicentre, randomised controlled trial

Prof Frank R Lin, MD   • James R Pike, MBA • Prof Marilyn S Albert, PhD • Michelle Arnold, PhD • Sheila Burgard, MS • Prof Theresa Chisolm, PhD • et al. [Show all authors](#) • [Show footnotes](#)

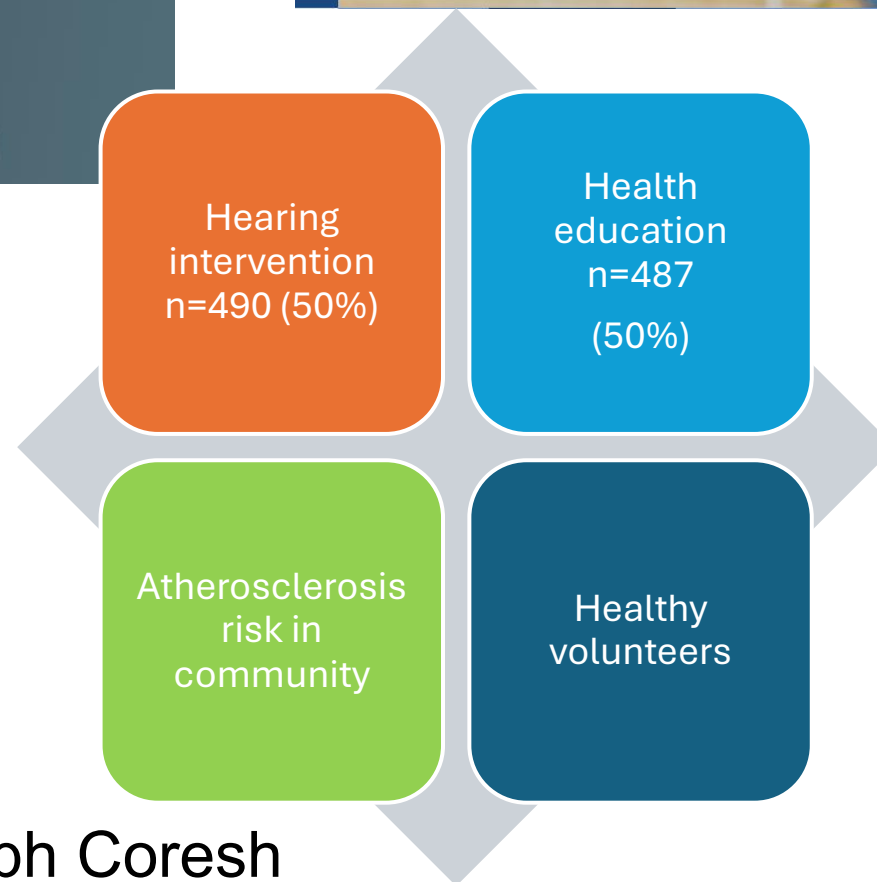
Published: July 17, 2023 • DOI: [https://doi.org/10.1016/S0140-6736\(23\)01406-X](https://doi.org/10.1016/S0140-6736(23)01406-X) •  Check for updates

### Aim-

To determine if treating hearing in older adult can reduce the risk of cognitive decline and dementia

N= 977 RCT 2017- 2019 enrolment; followed up over 3 years

Professors Frank Lin and Joseph Coresh

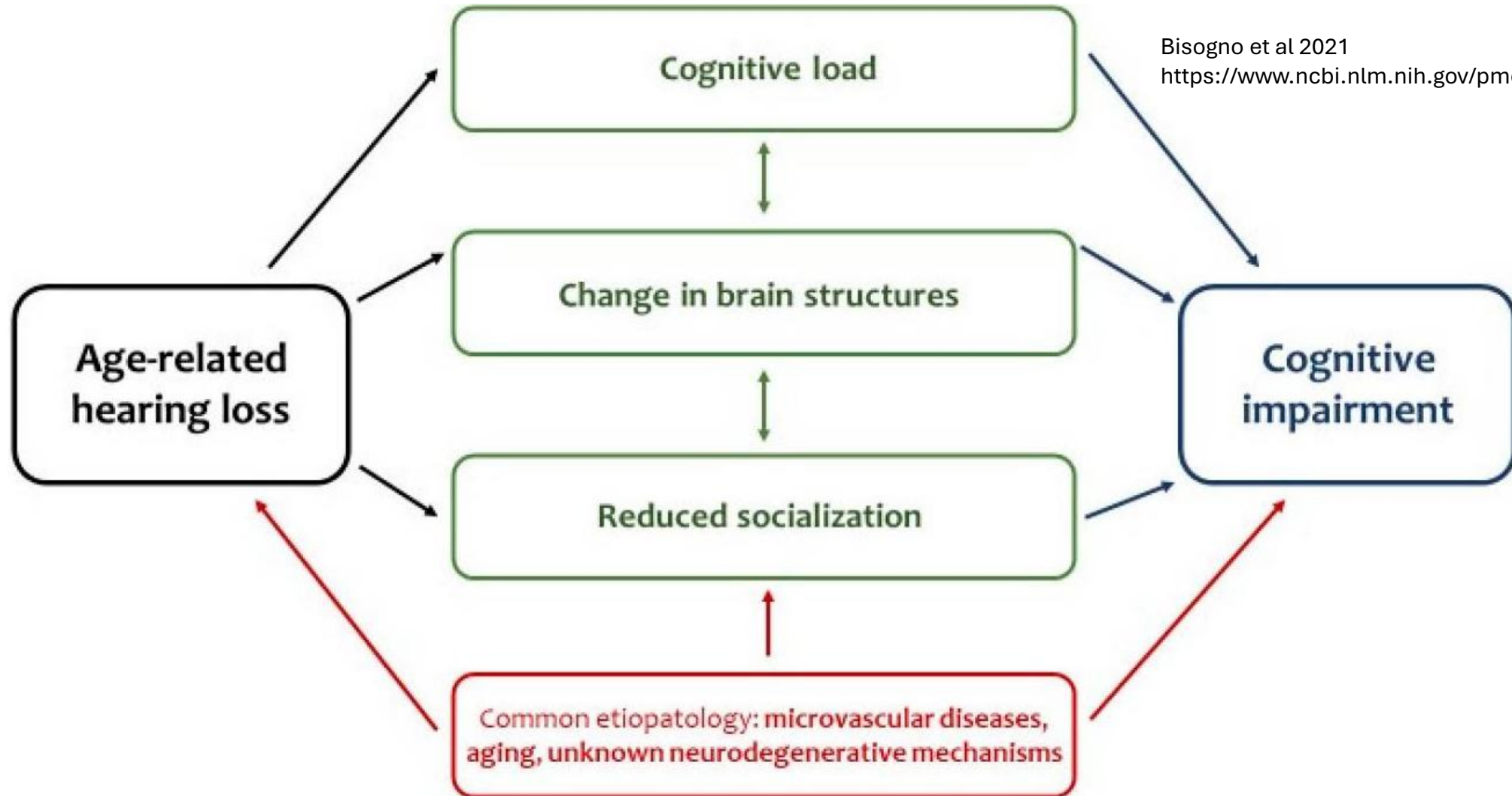


Significant difference in the effect of the hearing intervention on 3-year cognitive change between the ARIC and de novo cohorts ( $p_{\text{interaction}}=0.010$ )





# Hearing loss and cognitive impairment theories



# Prof Frank Lin- highlights the PTA4 score

## Now more apps for accurate hearing test through good quality ear pods



PTA4 individual ear **hearing score**

- Can follow your hearing number over the years



## In conclusion

- Older people do just as well with cochlear implant speech perception outcomes as younger patients
- Don't wait for the hearing to drop further, profound compared with severe preoperative hearing gives worse outcomes
- Screening for cognitive impairment, anxiety and depression should be considered