CI for older people:
never too old for a cochlear implant

CIICA Conference Brussels 16th – 17th October 2025

Clinical Professor Catherine Birman OAM

MBBS PhD FRACS

Meet Mike

He is in his early 80s
He has a background of progressive hearing loss, worse in the right ear

4FA right 91dBHL; left 66dBHL

Right cochlear implant 3 months ago

Graded practice	Materials	comments
Identify environmental sounds	Walk about your home and area identifying new sounds Angel sounds on line has environmental sounds	Toilet flush is loud, bird sounds, clock ticking in the hall
Practice partner	Pages to read and practice- identify fruit, phrases etc Regular simple chats- eg the peas are green	Regular chatting and practice listening and interacting
Apps streamed to the CI ear	ReDi Hearoes Angel Sounds	Blue toothed to the CI- do a few exercises whilst waiting in line at the shops
Read aloud to yourself, CI ear only on	Take your time, when not stressed Total 30 min a day- ideally for years	Can be 10 min here, 15 min there Think of it like learning the piano- 30 min a day practice will help improve and maintain listening skills
Audiobook with the hard copy to read along with it	Slow the speed to 50%	Your eyes and brain know what is being said and you are training your brain to hear and understand it
	Bring the speed back to normal	
Audiobook no hard copy	Slow the speed to 50%	Now you are just relying on listening to understand- slow it down initially to be able to follow along
	Bring the speech back to normal	
Podcasts	Slow the speed to 75%	Just relying on listening, slow it down initially to be able to follow along
	Speed normal	

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


Cochlear implants are indicated when hearing aids are not enough

JAMA Otolaryngol Head Neck Surg. 2020;146(10):942-953. doi:10.1001/jamaoto.2020.0998
Published online August 27, 2020.

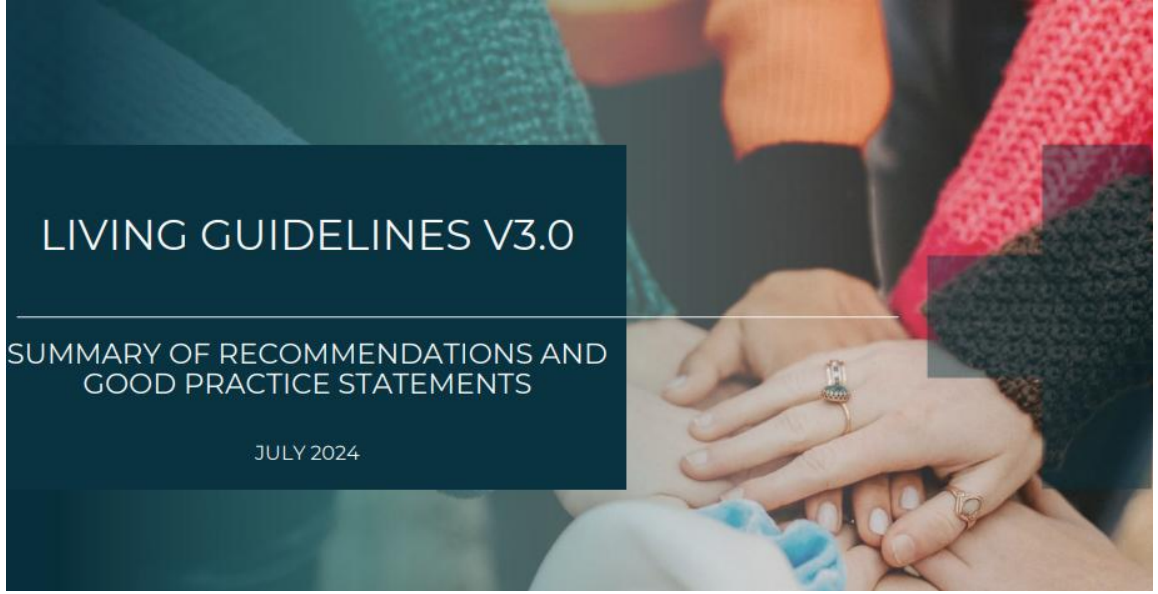
Clinical Review & Education

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



CI Users, family members and clinical teams

Person centred care

Cochlear Implant International Community of Action (CIICA)

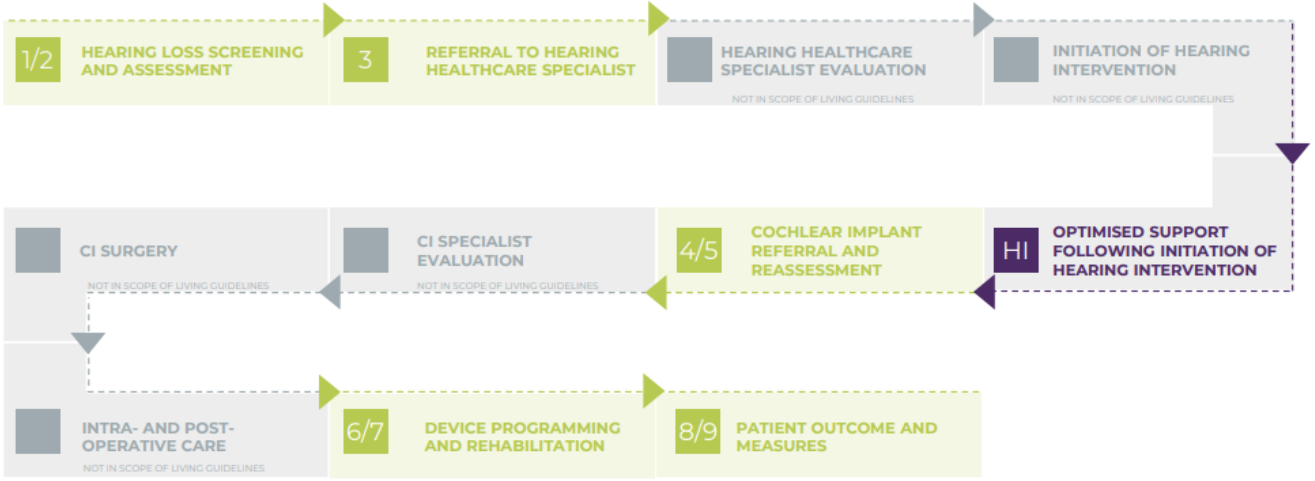
www.ciicanet.org

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.

CIICA

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.

SCIC

COCHLEAR
IMPLANT PROGRAM
An RIDBC service

CIICA 26th June 2025

Life expectancy 65 years and older

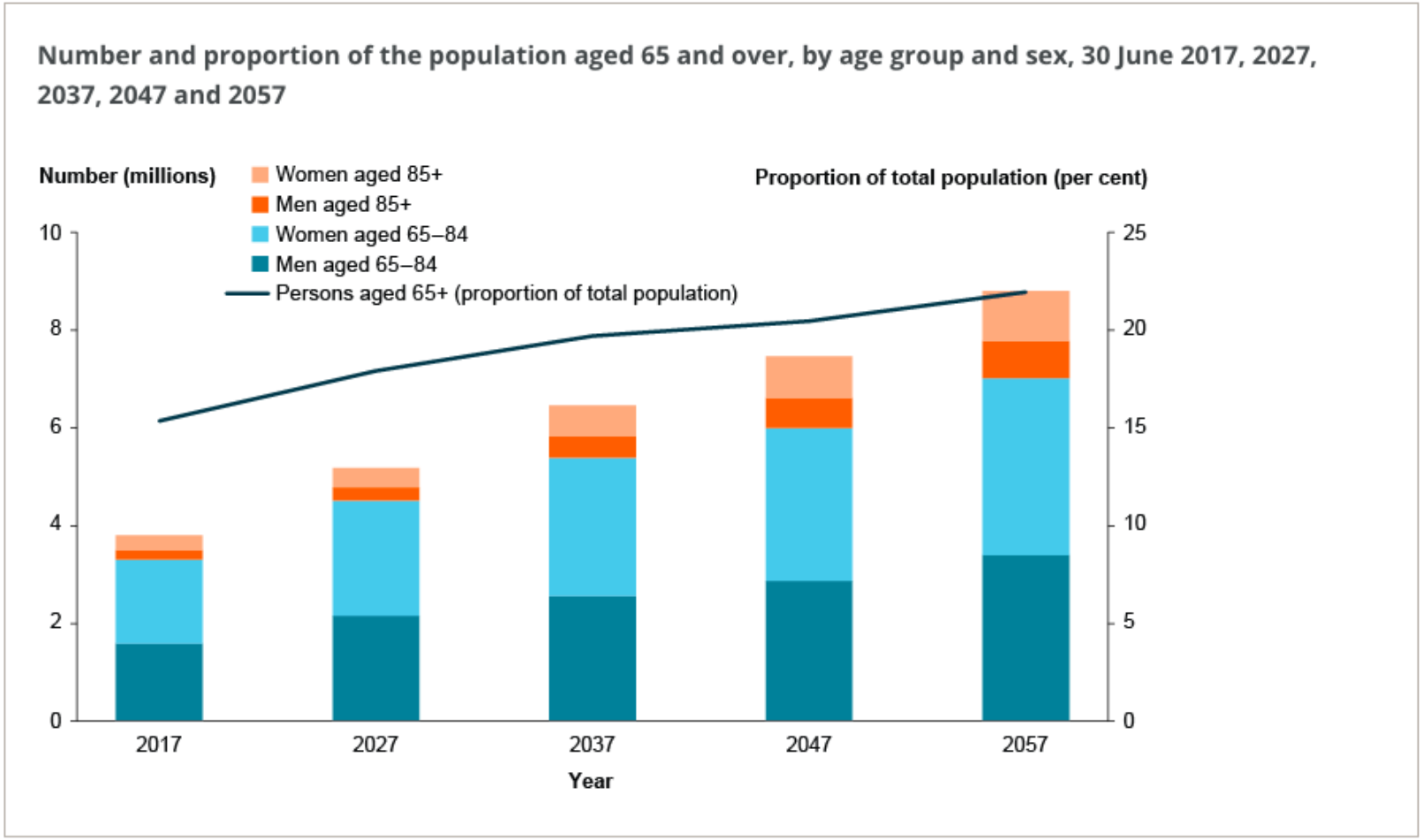
Australian Census 2022

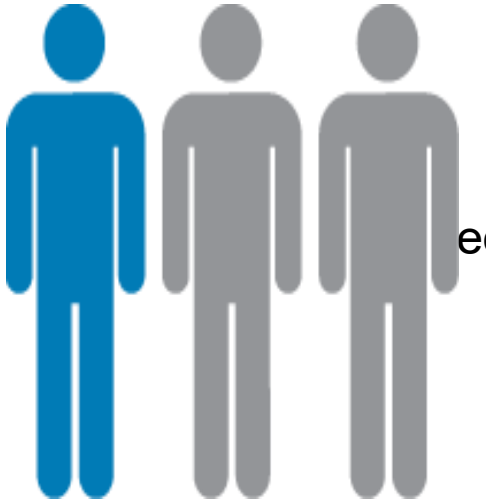
Age	M	F
65	20.34765	22.97584
75	12.67336	14.60333
85	6.55944	7.65816
95	3.05133	3.41557

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
96	2.85722	3.17654
97	2.66861	2.95091
98	2.48069	2.76329
99	2.29472	2.59516
100	2.13095	2.44444

People aged 65 years and over- the number and proportion of the population of people will double over the next 40 years





Nearly

1 in 3

eople over 65 years old is affected by hearing loss[3]

CI for older people
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- It is not just about hearing

Original Study

Otol Neurotol **44:**438–446, 2023.

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

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

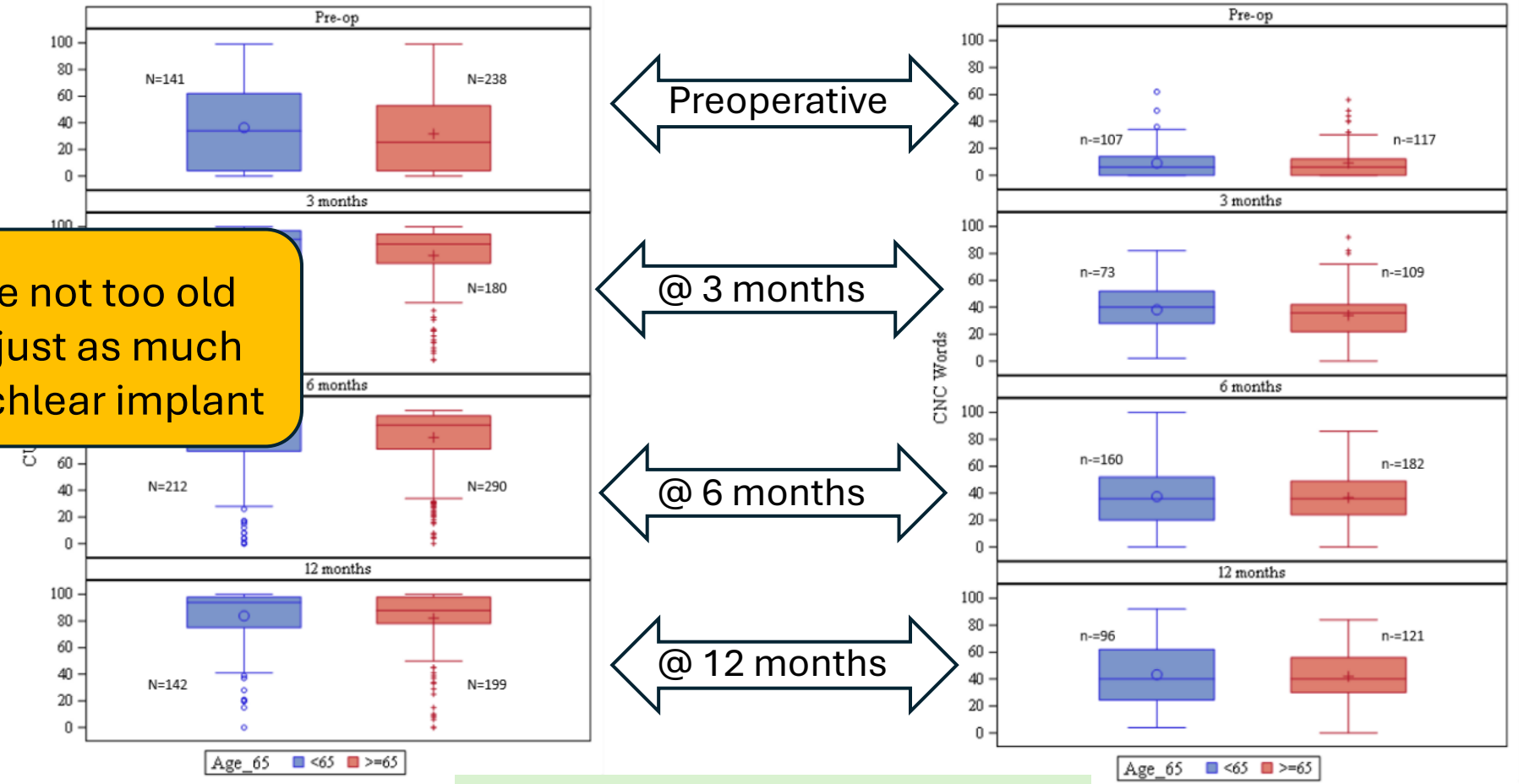
N= 785

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

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

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



No significant difference

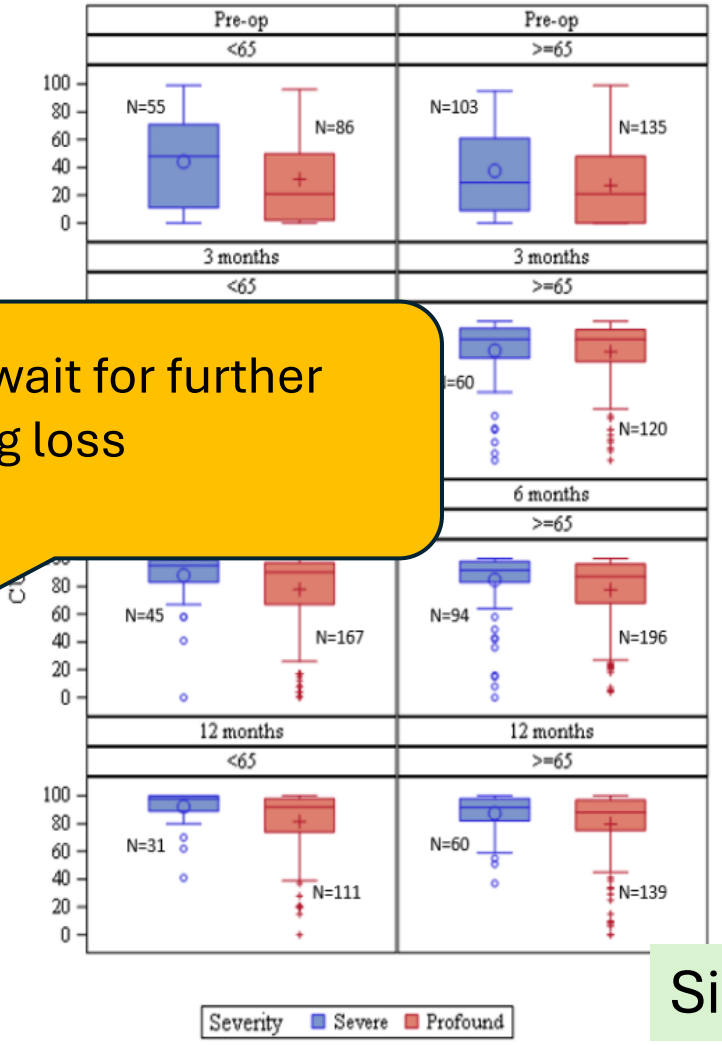
Significantly poorer outcomes, in both age groups, with preoperative profound vs severe hearing loss

CUNY sentences severe vs profound p<0.001

CNC words severe vs profound p<0.0001

<65 years ≥65 years

<65 years ≥65 years



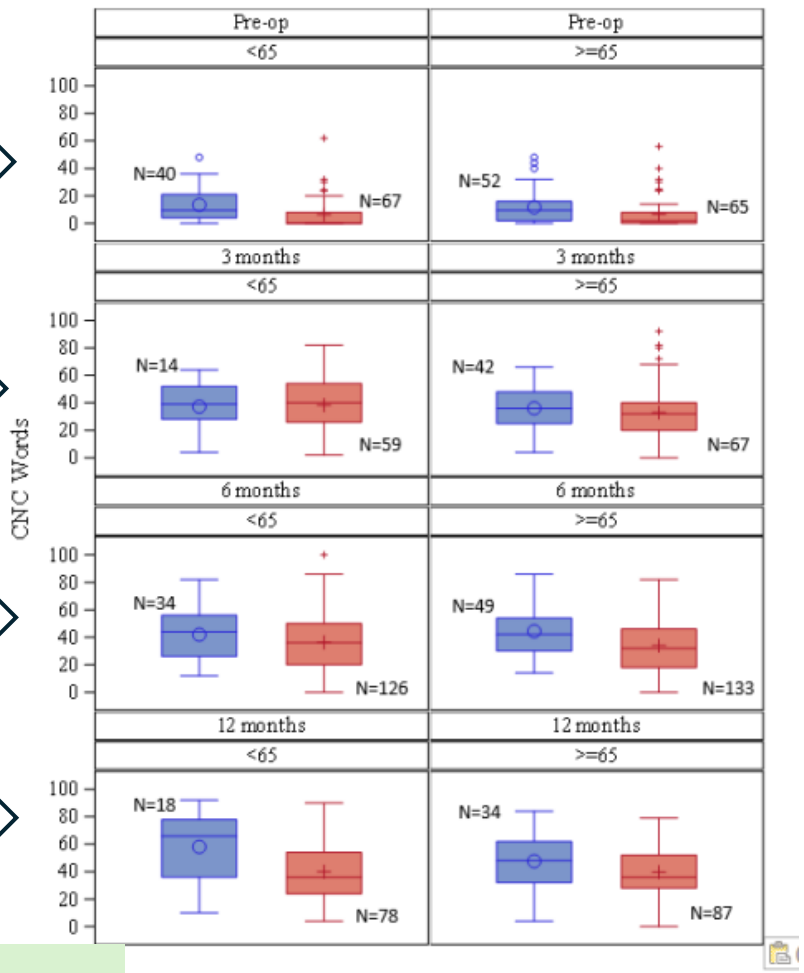
N-785

Preoperative

@ 3 months

@ 6 months

@ 12 months

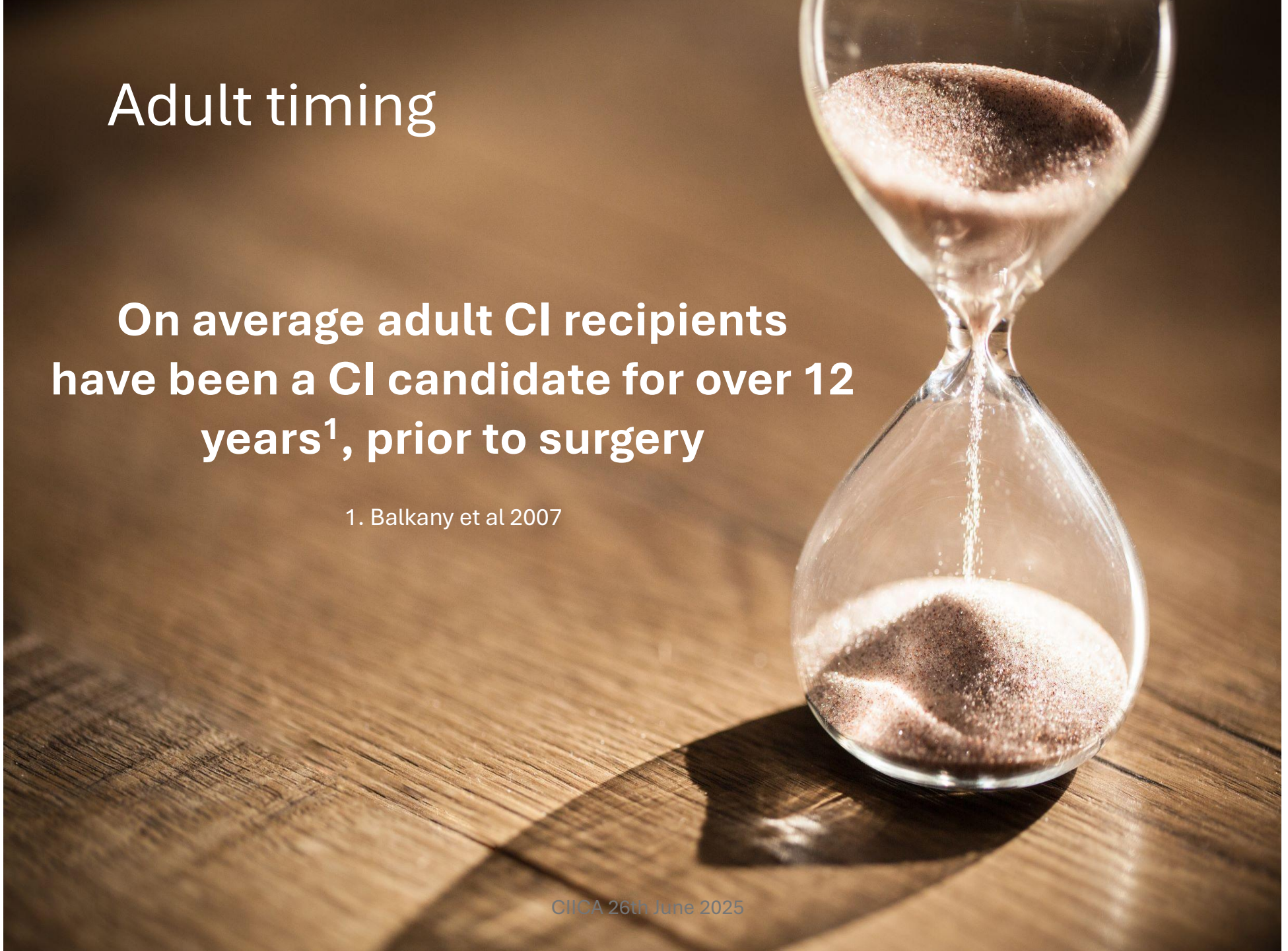


Don't wait for further hearing loss

Significant difference

Birman & Hassarati 2023

Adult timing



On average adult CI recipients have been a CI candidate for over 12 years[1], prior to surgery

1. Balkany et al 2007

CI for older people
What do we know?

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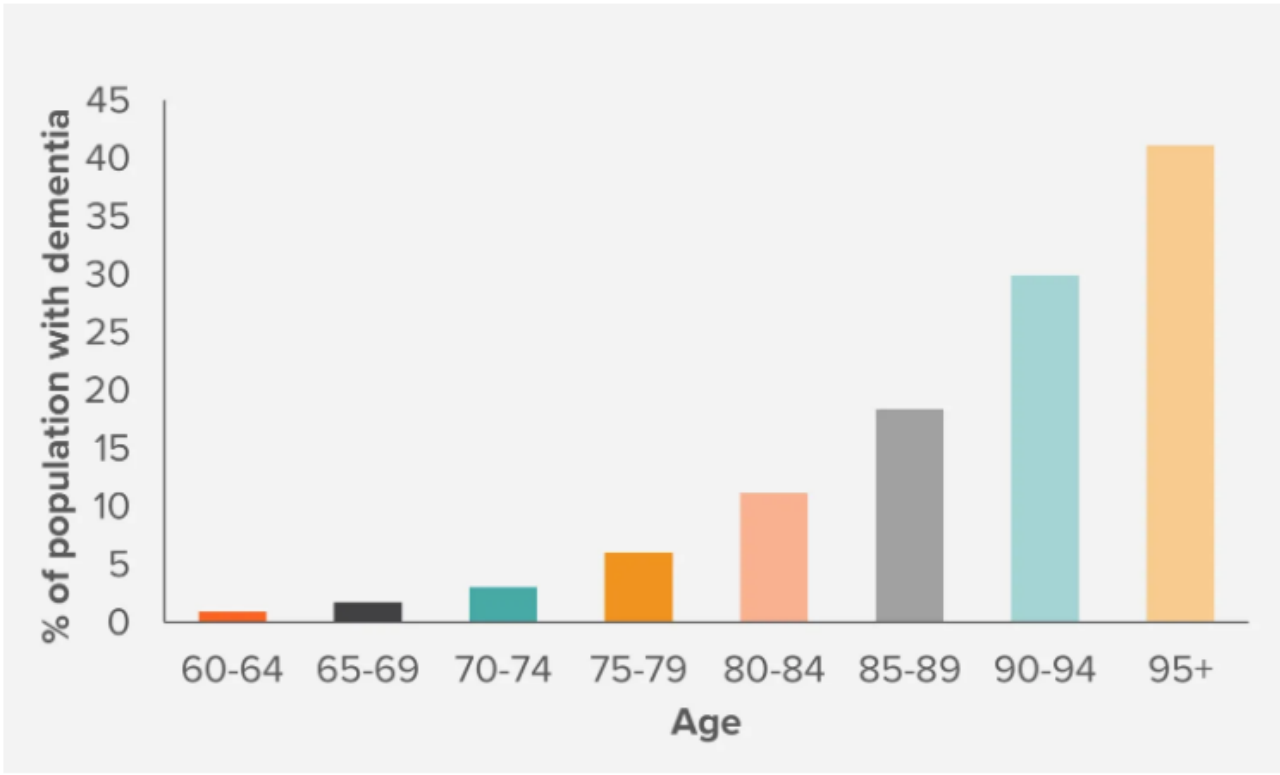
- **It is not just about hearing**

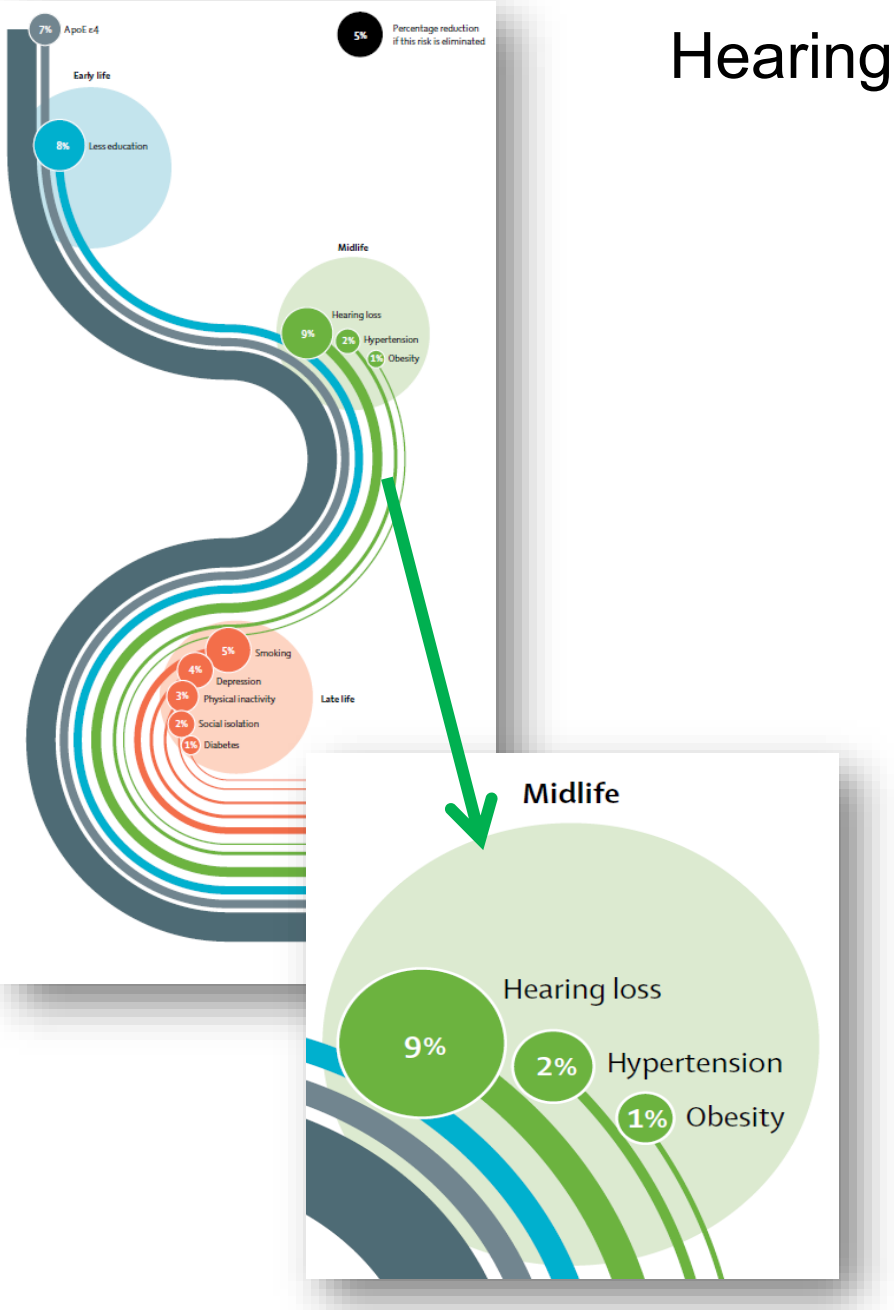
Dementia incidence increases with age

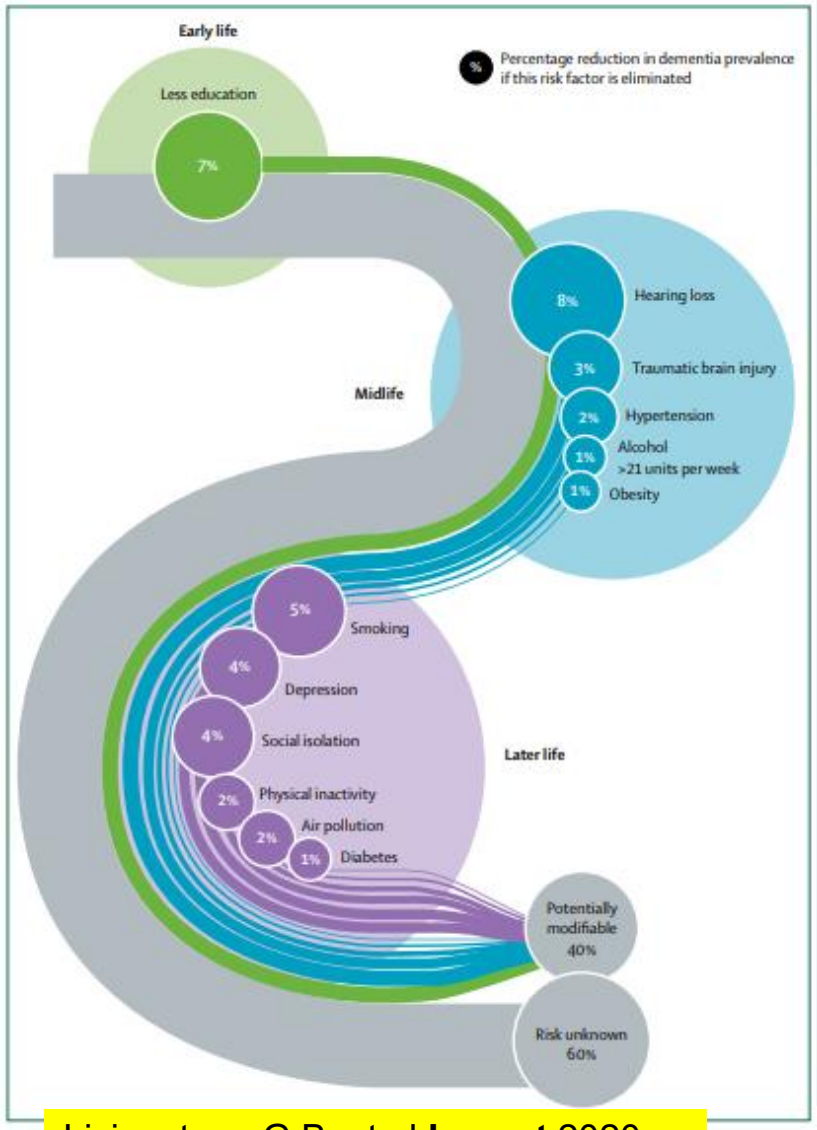


Data from Prince, M et al (2014) Dementia UK: Update Second Edition report produced by King's College London and the London School of Economics.

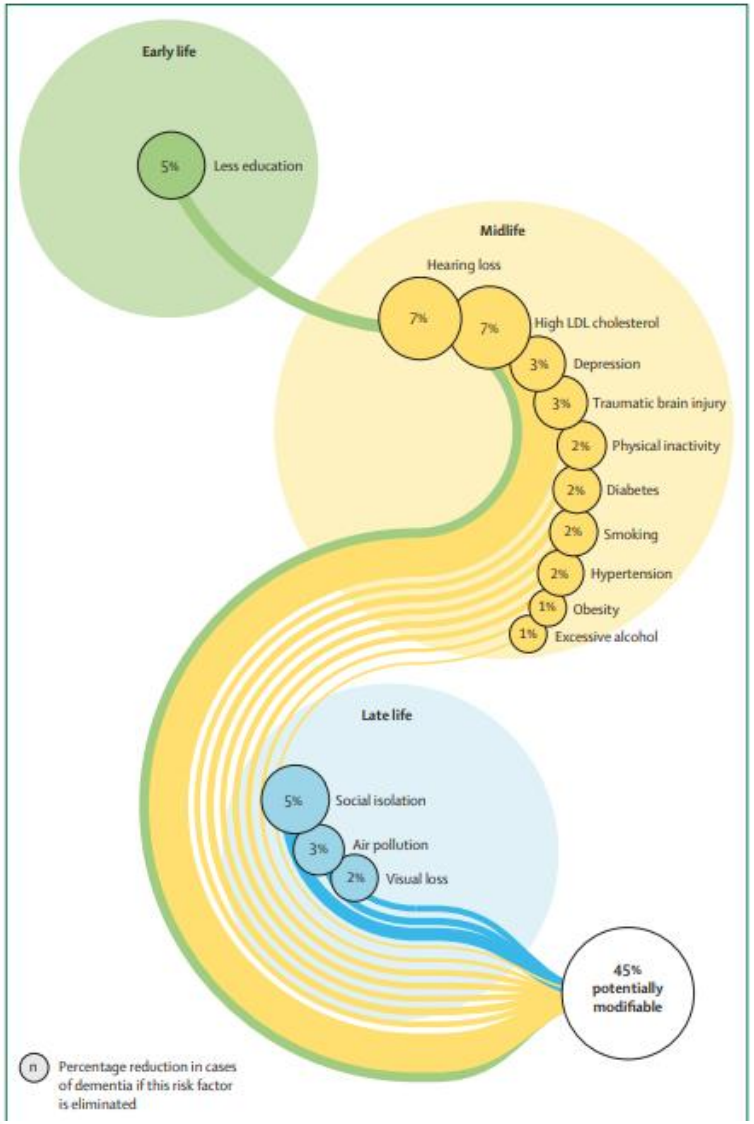
www.alzheimersresearchuk.org/

Hearing loss- largest single modifiable risk factor for dementia





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



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

Livingston G B, et al. **Lancet** 2017

ORIGINAL CONTRIBUTION

Arch Neurol. 2011;68(2):214-220

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

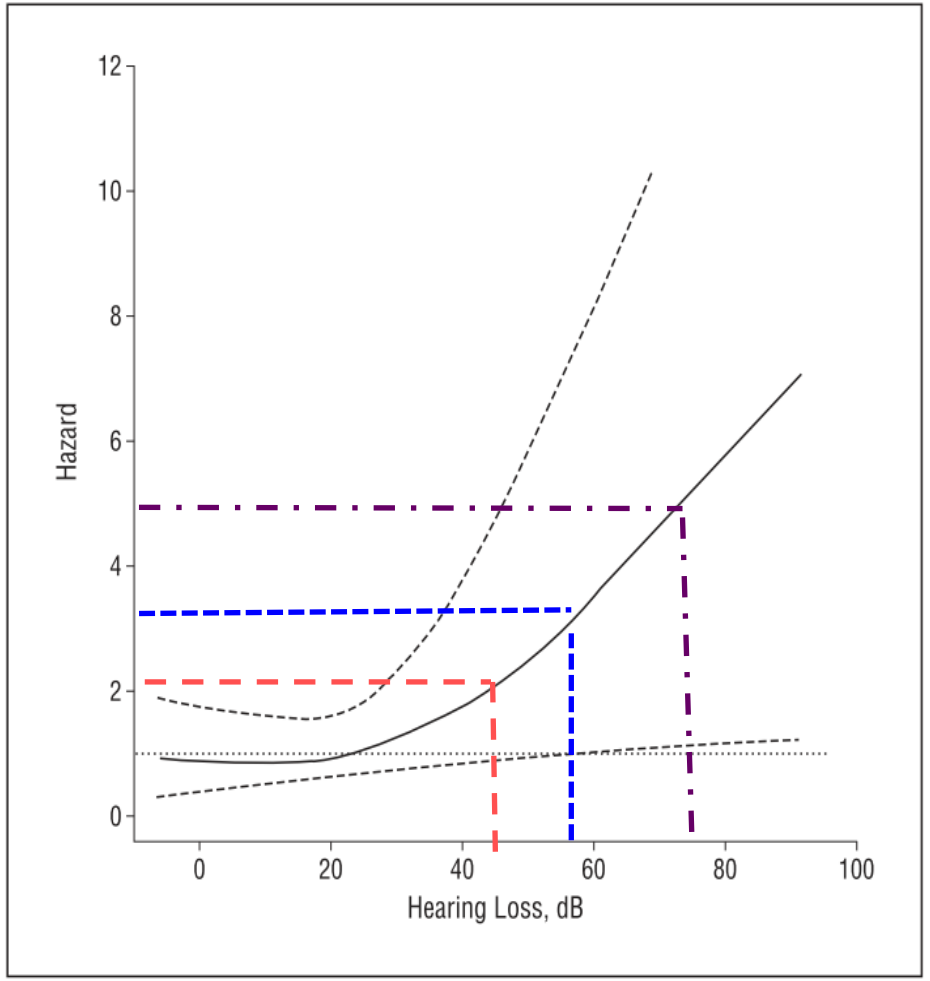


Figure 2. Risk of incident all-cause dementia by baseline hearing loss after adjustment for age, sex, race, education, diabetes mellitus, smoking, and hypertension. Hearing loss is defined by the pure-tone average of thresholds at 0.5, 1, 2, and 4 kHz in the better-hearing ear. Upper and lower dashed lines correspond to the 95% confidence interval.

THE LANCET

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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

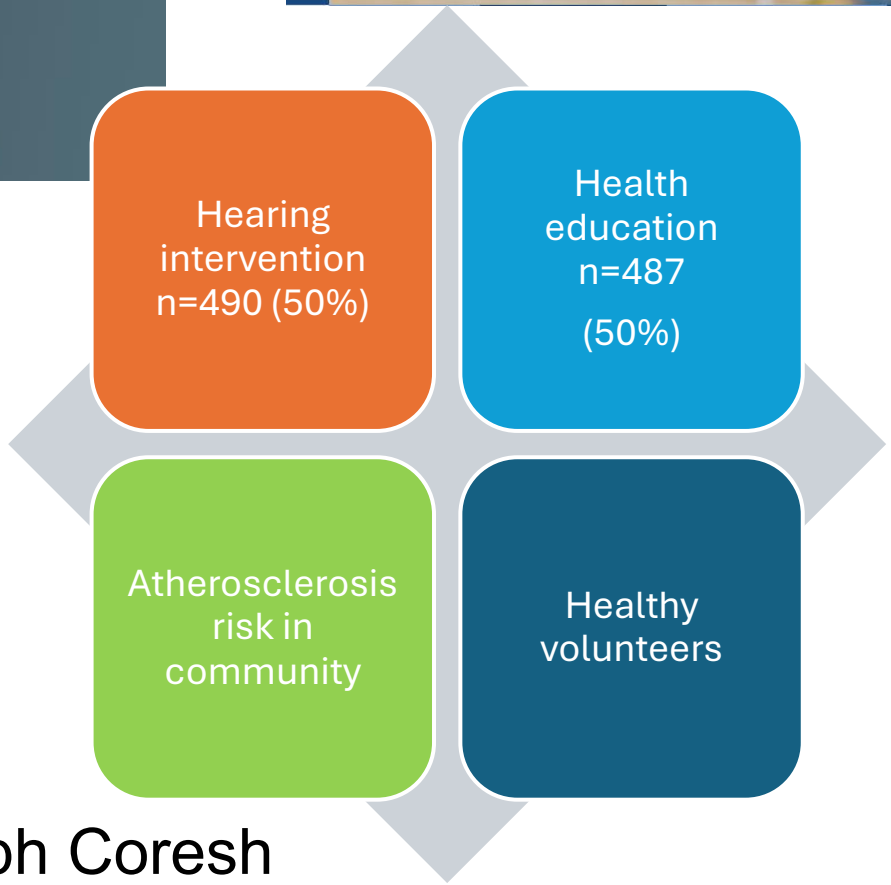
Prof Frank R Lin, MD • James R Pike, MBA • Prof Marilyn S Albert, PhD • Michelle Arnold, PhD • Sheila Burgard, MS • Prof Theresa Chisolm, PhD • et al. Show all authors • Show footnotes

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

COCHLEAR CENTER *for* HEARING *and* PUBLIC HEALTH

JOHNS HOPKINS BLOOMBERG SCHOOL *of* PUBLIC HEALTH

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

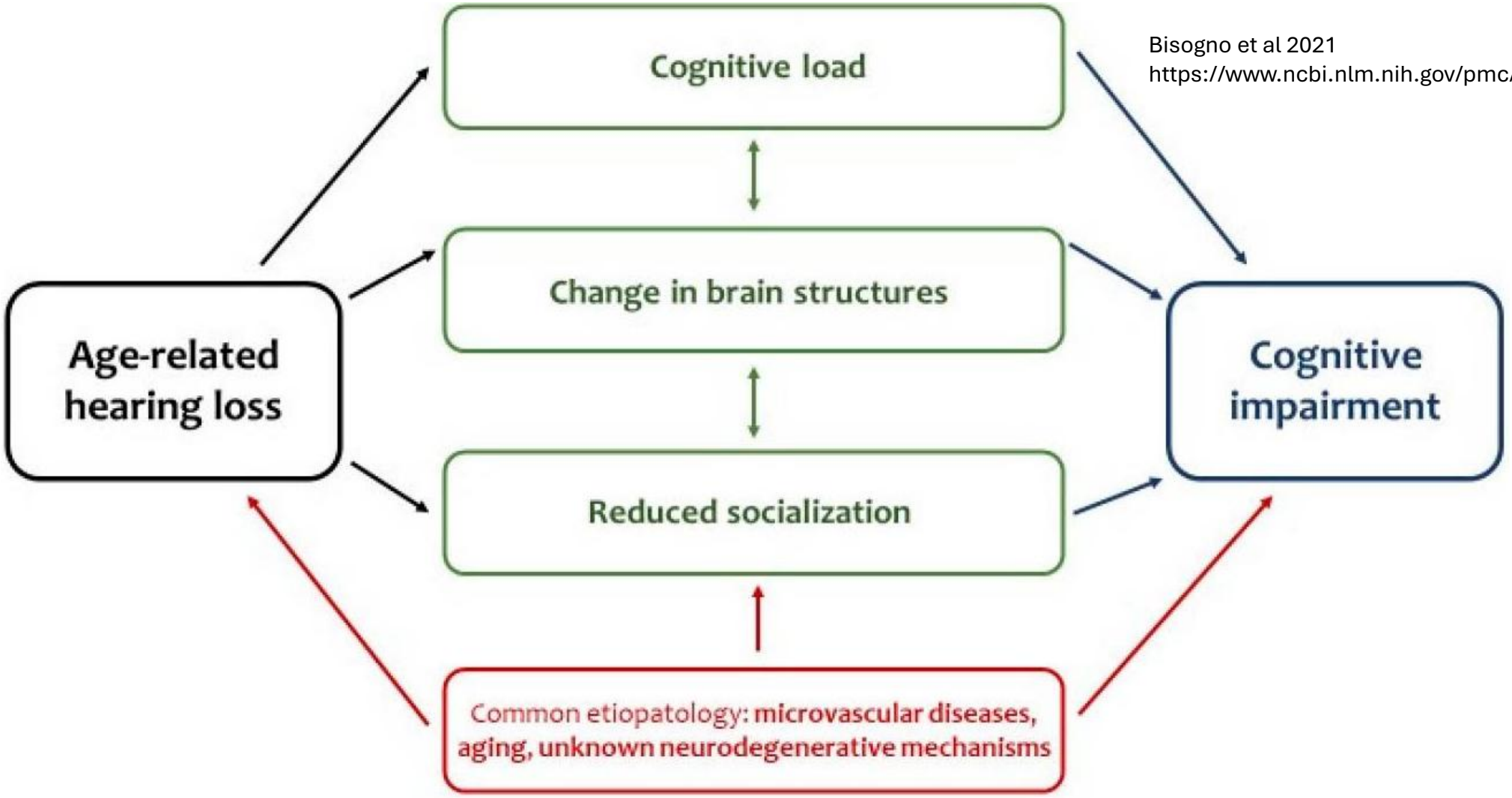


Significant difference in the effect of the hearing intervention on 3-year cognitive change between the ARIC and de novo cohorts ($p_{interaction}$=0·010)

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

Professors Frank Lin and Joseph Coresh

Hearing loss and cognitive impairment theories



Bisogno et al 2021
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8538578/

30,097 adults aged 45 to 85 using data from the Canadian Longitudinal Study on Aging followed up for at least 20 years- from the comprehensive cohort (cognitive testing, audiology, bp etc) baseline 2010 to 2015 and follow up 2015 to 2018- follow up

The Journal of Prevention of Alzheimer's Disease 12 (2025) 100321

Contents lists available at ScienceDirect

The Journal of Prevention of Alzheimer's Disease

journal homepage: www.elsevier.com/locate/tjpad

Original Article

Identifying the optimal combinations of modifiable dementia risk factors to target in multidomain intervention – Three-year longitudinal findings from the Canadian longitudinal study on aging

Surim Son [a,b], Mark Speechley [a], Guangyong Zou [a,c], Manuel Montero-Odasso [a,b,d,*]

- A total of 12 modifiable risk factors – less education, hearing loss, traumatic brain injury, hypertension, excessive alcohol consumption, obesity, smoking, depression, social isolation, physical inactivity, diabetes, and sleep disturbance (taken from the Lancet article 2020)
- Exposure to multiple risk factors can have cumulative and interactive effects that may modify a risk factor's effect on dementia risk
- Multiple risk factors can benefit from a single intervention eg exercise can help improve physical inactivity, obesity, hypertension, and sleep disturbance.
- Understanding the combined effects and interactions among risk factor combinations has been suggested not only to help identify at-risk populations who are likely to benefit the most but also to identify risk factor combinations that are most effective to target
- The combinations that were both *highly prevalent and had the most detrimental effect* on global cognition were:
- **hearing loss and physical inactivity** – top 2 factors
- **hearing loss, physical inactivity, and hypertension** – top 3 factors
- **hearing loss, physical inactivity, hypertension, and sleep disturbance-** top 4 factors

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

- Never too old for a cochlear implant
- 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 hearing loss throughout life and particularly from middle age onwards