Dr. Kelly Churchill
Founder and Owner
Advanced Hearing Care

Association of Age-Related Hearing Loss With Cognitive Function, Cognitive Impairment, and Dementia

A summary of the latest medical research


CAN
YOU
HEAR
ME
NOW?

Located in the Mountain View Medical Plaza …

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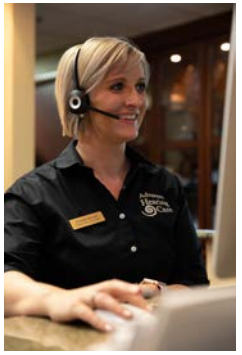

Your Las Cruces Hearing Care Professionals

Three Doctors of Audiology

Dr. Kelly (Frost) Churchill

Doctor of Audiology, CCC-A

B.S. (Phi Beta Kappa) University of Wisconsin Madison in Communicative Sciences and Disorders

M.A. University of Iowa Audiology in Audiology

Au.D. from Arizona School for Health Sciences.

Dr. Allie Williams

Doctor of Audiology, CCC-A

B.S. (Honors) Mississippi University for Women in Speech Language Pathology with a Psychology minor.

Au.D. Southern Mississippi

Dr. Christianne Robertson

Doctor of Audiology, CCC-A

B.S. (Honors) Texas Woman's University in Communication Sciences and Disorders.

Au.D. Texas Tech University Health Sciences Center.

Patient Care Coordinator

Krystal Altrock-Brant

B.A. New Mexico State Uiversity

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Definitions: Hearing Loss and Dementia

Dementia

- ❑ A complex, multi-factorial process
- ❑ A group of syndromes characterized by a progressive loss of mental function
  - ✓ interfere with performing everyday activities
  - ✓ impaired processing
  - ✓ emotional prosody is often present

Hearing Loss

- ❑ An **auditory-cognitive-based condition** that interferes with
  - ✓ communication
  - ✓ cognitive function
  - ✓ performing everyday activities
- ❑ A condition of impaired processing
  - ✓ impaired auditory encoding in the cochlea
  - ✓ impaired decoding in the brain

Hearing loss comes from an injury to the outer, middle, or inner ear that impairs audio processing and directly impairs cognitive processing

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Question:

Is age-related hearing loss associated with an increased risk for cognitive decline, cognitive impairment, and dementia?

Findings:

Age-related hearing loss was significantly associated with

1. decline in all areas of cognitive performance
2. increased risk for cognitive impairment and incident dementia.

However, age-related hearing loss is not associated with increased risks for Alzheimer.

Meaning:

Age-related hearing loss is a biomarker for cognitive decline, cognitive impairment, and incident dementia.

Take Home:

Age-related hearing loss is a modifiable risk factor for reducing chances of cognitive decline, cognitive impairment, and dementia.

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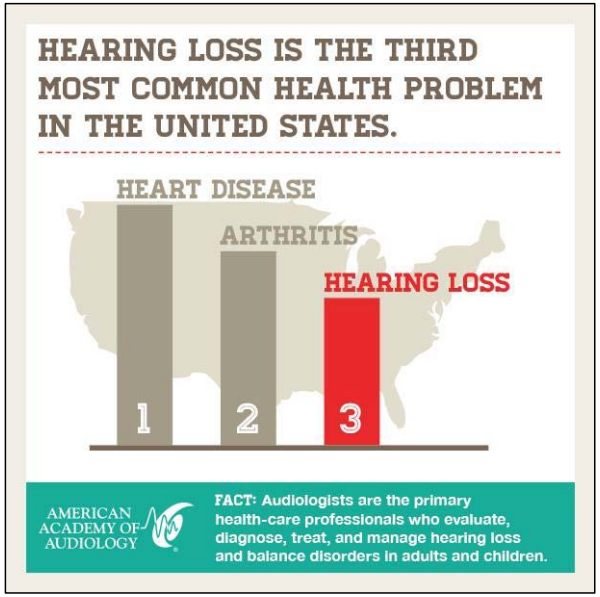
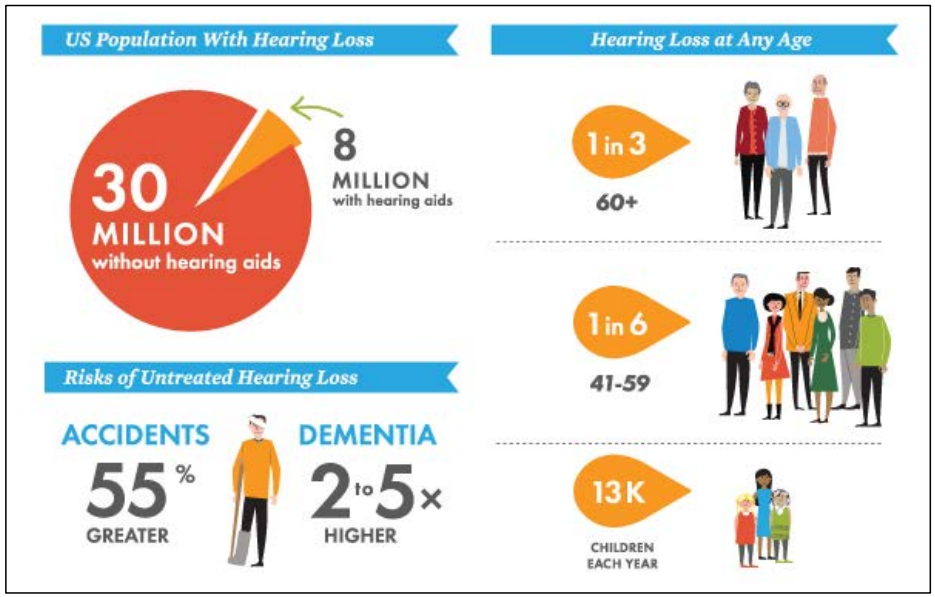
Hearing Loss Today, Tomorrow, and Its Impact

38 million People have Hearing Loss
8 Million (20%) embrace Hearing Aids

80% of People w/ Untreated Hearing Loss





18 million

13 million

7.1 million

85% of physicians do not screen or inquire about hearing loss in their patients
60% of Americans say they rarely think about hearing loss
55% of people still view hearing aids as antiquated technology with a social stigma

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Hearing Loss Today, Tomorrow, and Its Impact

Hearing loss is costly.

The cost for the first year of hearing loss treatment in older adults is projected to increase more than 500% from $8 billion in 2002 to an **estimated $51 billion in 2030**.

SOURCE: Journal of the American Geriatrics Society, 2010

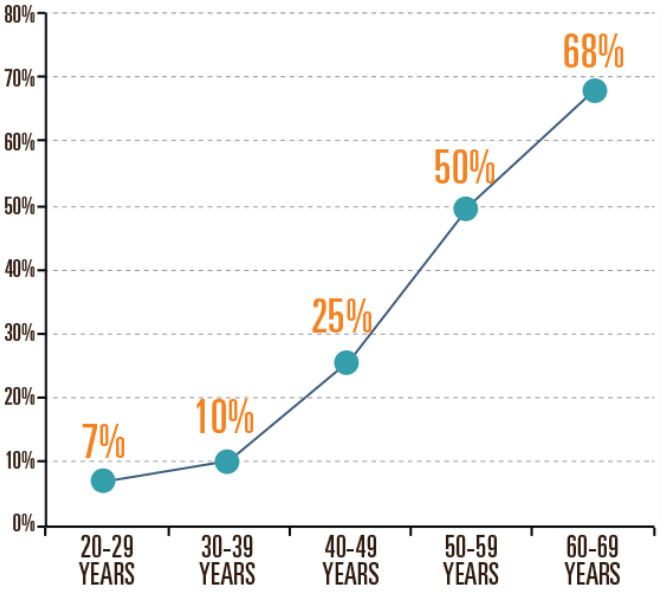
Hearing loss from loud noise can be prevented.

About 70% of people exposed to loud noise never or seldom wear hearing protection.

SOURCE: National Health and Nutrition Examination Survey, 2011-2012

People with hearing loss.

(Not able to hear high-pitched sounds)



SOURCE: National Health and Nutrition Examination Survey, 2011-2012

World Total Cost

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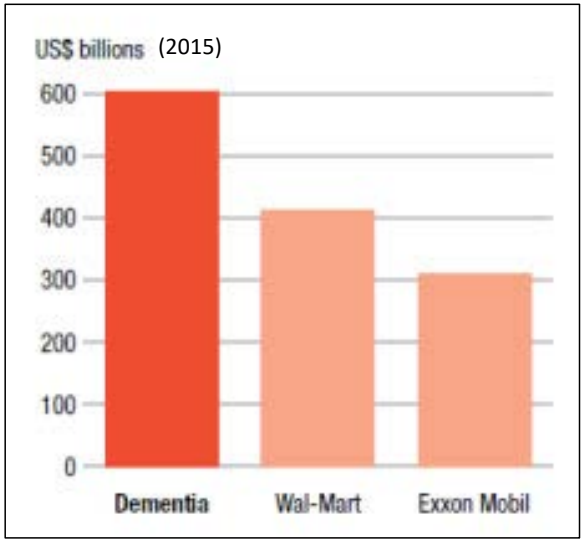
Dementia Today, Tomorrow, and Its Impact

Dementia costs the equivalent of the 8th largest national economy globally

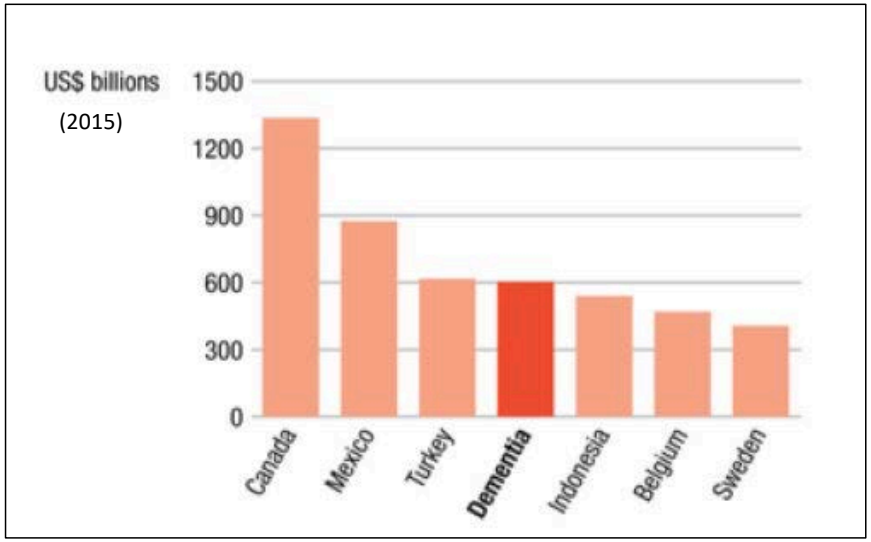
$341,840

Approximate lifetime cost of care for an individual living with dementia in 2018.

Cost of Treating Dementia



Dementia Compared to Country Economies



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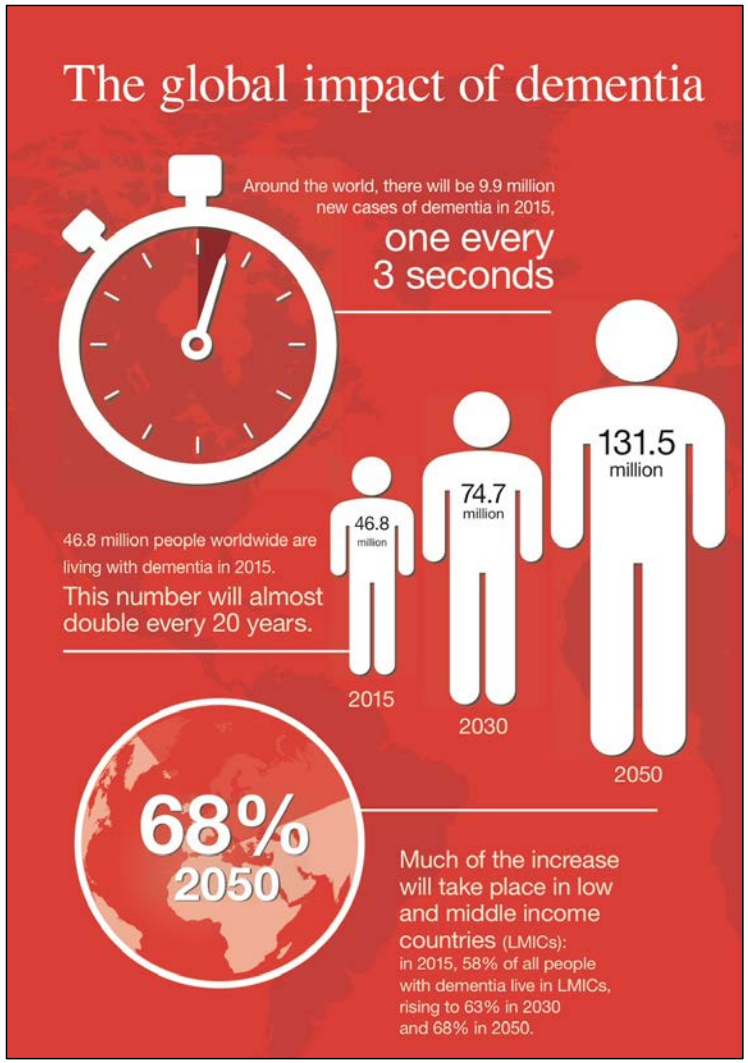
Dementia Today, Tomorrow, and Its Impact

Today, Dementia affects **46.8 million people** worldwide at a cost of **$818 billion**!

By 2050, is projected to affect **131.5 million people** at cost of **$2 trillion**!

PhD and MD Researchers argue that modifying risk factors will be most effective means to reduce impact

So what are the known associated modifiable risk factors with dementia?



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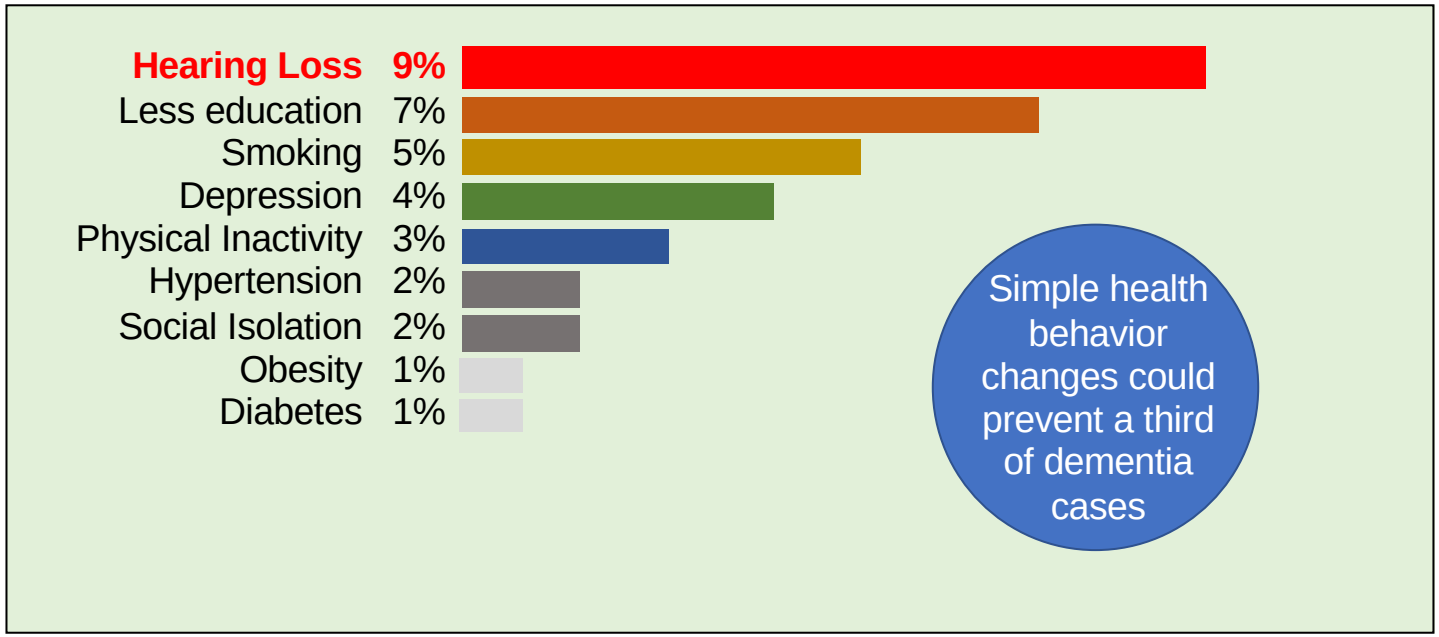
Modifiable Risk Factors for Dementia

(Lancet Commission Report, 2017)



Non-modifiable Risk Factors: Age, Gender, Family History

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Hearing Loss and Dementia

- Occur insidiously and **frequently unrecognized**
- Hearing loss and cognitive decline are **frequently attributed to aging**
- Consequence of **delayed recognition** is detrimental to health
- **Early detection** may improve patient outcomes
- Stigma and misunderstanding negatively effect persons with dementia and hearing loss
- **General practitioners** often **dismissive** and unhelpful
- **Ability to hear provides greater cognitive reserve for remembering, responding, analyzing and even thinking**

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Hearing Loss and Dementia: The Risk

(Lin, et al., 2011, 2013, 2017)

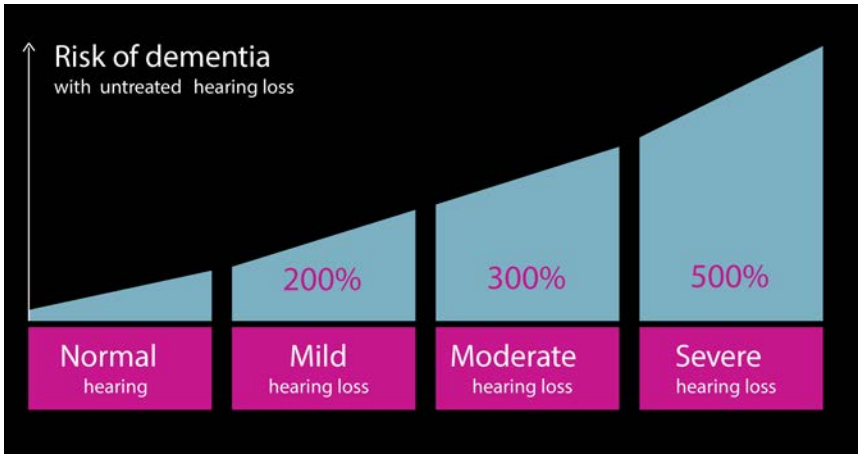
Dr. Frank Lin, M.D.
Professor, John Hopkins University

Hearing loss INDEPENDENTLY associated with incident, all-cause dementia (11.9 year follow up)

Risk of incident dementia is associated with baseline hearing loss

Risk increases for dementia with baseline hearing loss

- Severe hearing loss 5X more likely
- Moderate hearing loss 3X more likely
- Mild hearing loss 2X more likely



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Hearing Loss and Dementia: Transition Time

(Gurgel, et al., 2014)

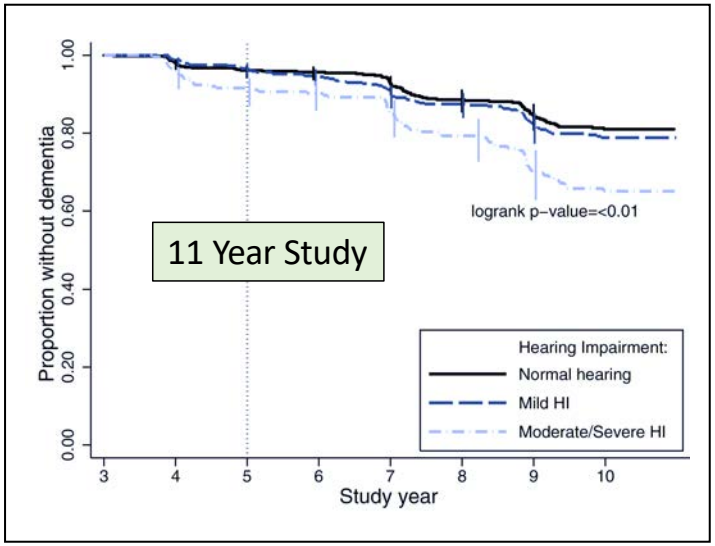
Dr. Richard Gurgel, M.D.
ENT-otolaryngologist in Salt Lake City, Utah and is affiliated with multiple hospitals in the area, including Intermountain Medical Center and Later Day Saints Hospital

Of persons with mild hearing loss, 16.3% developed all-cause dementia as compared to 12.1% of those without hearing loss

Of persons with moderate/severe hearing loss, 26.2% developed all-cause dementia as compared to 12.1% of those without hearing loss

Over time, persons with hearing loss declined 54% faster than those without hearing loss

Mean time to all-cause dementia was 10.3 years in the hearing loss group



Normal/Mild

Moderate/Severe

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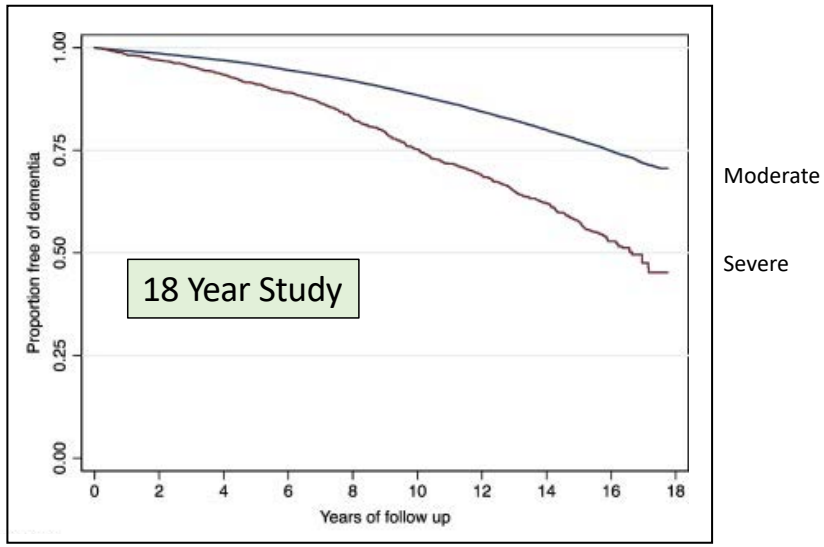
Hearing Loss and Dementia: Transition Time

(Davies, et al., 2017)

Dr. Hilary Davies, M.D.
Institute of Epidemiology and Public Health, University College London, London, United Kingdom

Moderate self reported hearing difficulties and moderate to severe hearing loss are cross-sectionally associated with dementia

Incidence of dementia (18 years) 30% higher in individuals with moderate hearing loss and 57% higher in those with severe hearing loss as compared to those with normal hearing after adjusting for multiple covariates



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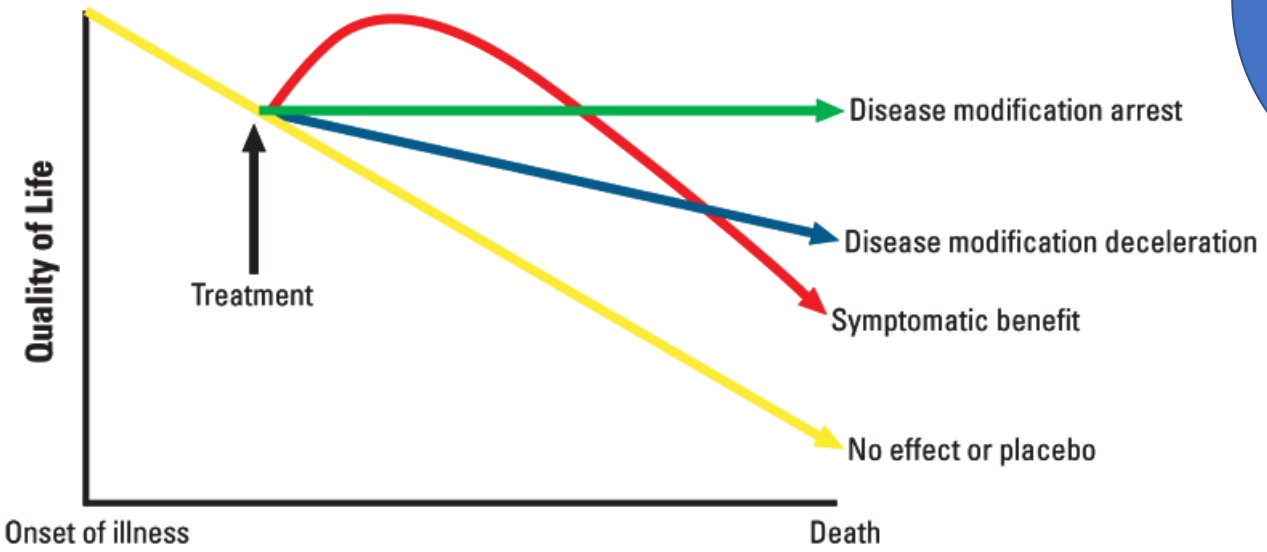
Disease Modification?

Can
Hearing Aids
Yield
Disease Modification
Deceleration?



Kennedy GJ. *Primary Psychiatry*. Vol 14, No 11. 2007.

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Conclusions on Efficacy of Sensory Interventions

Dr. Helena Amierva, PhD.
Institute of Epidemiology and Public Health, University College London, London, United Kingdom

There is no <u>direct</u> effect of hearing aids on cognitive decline; rather, reduction of depressive symptoms and social isolation likely mediate the association (Dawes et al., 2015; Amieva et al., 2015)

By facilitating improved communication, hearing aids improve mood, reduce anxiety, improve quality of social interaction, and increase social engagement, thereby positively impacting scores on cognitive tests (Amieva et al., 2015)

There is a positive effect of hearing aid use on depression, emotional loneliness, and cognitive status (Castiglione et al., 2016; Weinstein et al., 2016; Boi et al., 2012)

"*Hearing aids put cognitive decline on hold*" – Prof. Helena Amieva (2015)

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Conclusions on Efficacy of Sensory Interventions

Maharani et al., (2018)

Before the Study

There was a decline in episodic memory (immediate and delayed recall; backward count) leading up to hearing aid use in ALL participants

Effects of Hearing Aids

Rate of cognitive decline was significantly slowed down they began using hearing aids (mean age of hearing aid use – 62 years)

Hearing aid use may allow for better hearing input and delay cognitive decline by preventing adverse effects of auditory deprivation (e.g. depression, social engagement and self efficacy – supports **cascade hypothesis**!!

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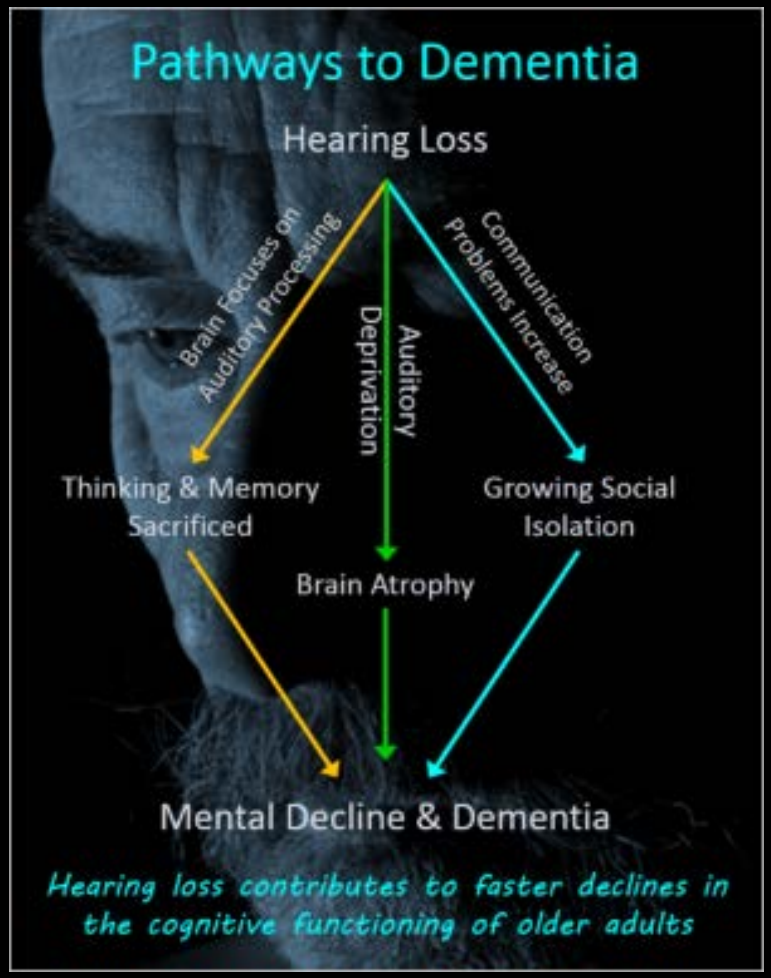
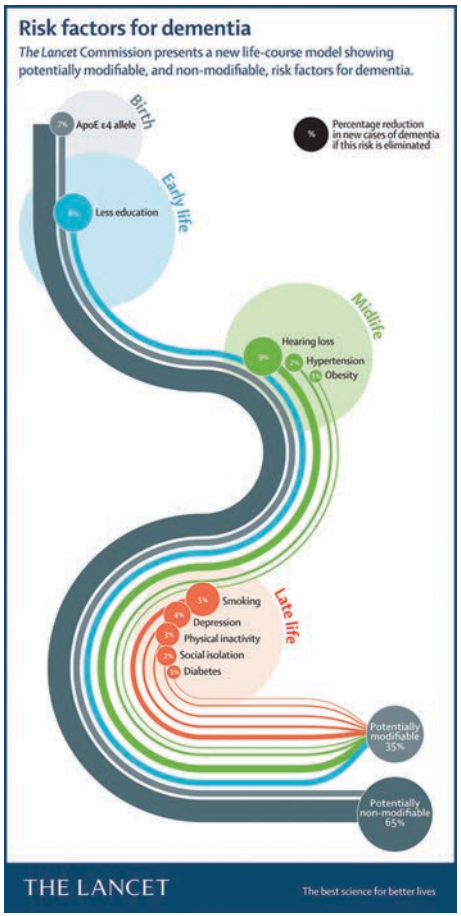
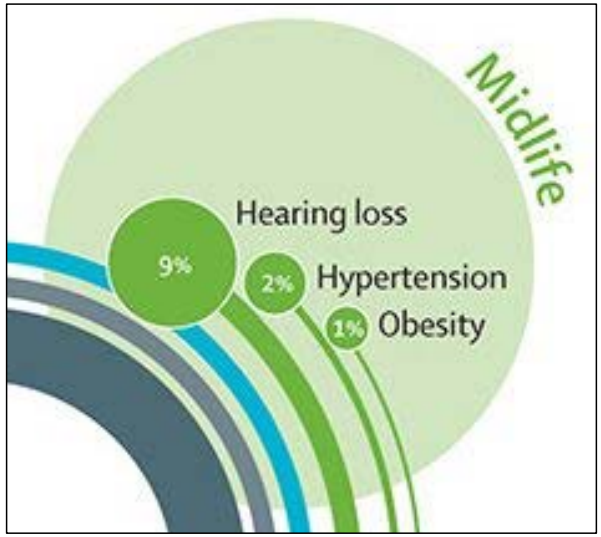
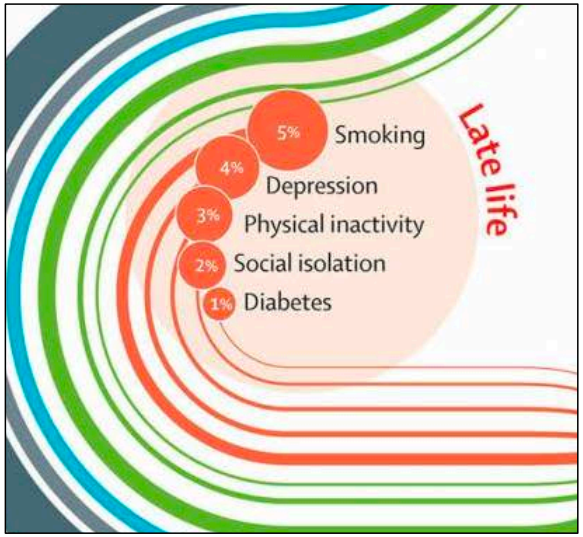
The Cascade Hypothesis

Hearing loss
|
Increased risk of…
Social Isolation
Physical inactivity
Depression
+
Brain Atrophy
(grey matter and audio cortex)
|
Accelerated
Mental decline
|
Higher Chances of Dementia









Hearing Loss (9% impact) starts in **Midlife**

Depression, (4%) Inactivity (3%), Social Isolation (2%), found in **Late life**, *are outcomes of hearing loss!*

Hearing Loss may be a cumulative risk factor of 18% later in life

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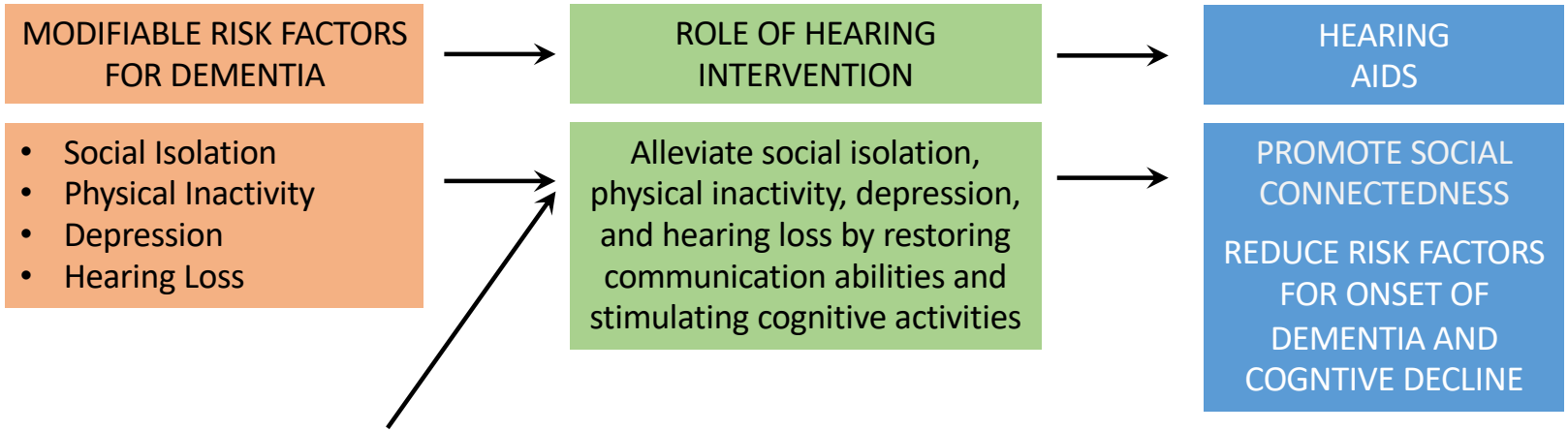
Take Away 1.



CASCADE HYPOTHESIS

- ✓ **Hearing Loss** is the Prime Risk Factor!
- ✓ **Hearing Loss** is risk factor for isolation, inactivity, and depression
- ✓ **Hearing Loss** -> Total Risk Factor = 18%!

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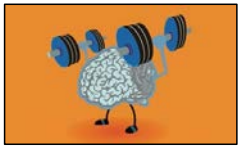
Take Away 2. WHY YOU SHOULD SEE A REAL AUDIOLOGIST



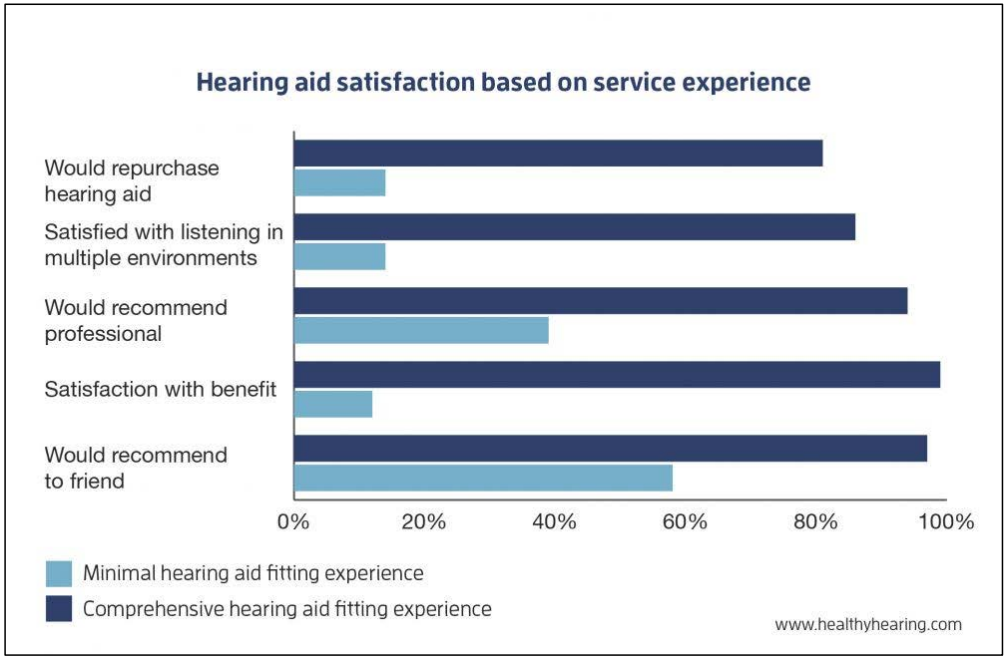
Hearing injuries are generally inoperable

Hearing aids are only tool for improving hearing

Hearing loss results in brain adaptation

With many sounds and speech clarity restored, by hearing aids, the brain must readapt; this takes a little time and is unique to individuals; coaching and education is central to success

Hearing aids are high-tech digital devices that require computer programming from an expert who incorporates the physics of ears, brain re-adaptation strategies, and hearing aid capabilities



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Spread the Word to Family and Friends about the importance of Healthy Hearing!

Thank You

for your kind attention today!

Your Las Cruces Hearing Professionals

Educational, Ethical, Experience, Excellence

Board Certified Doctors of Audiology

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Care that is state-of-the-art.
Dedication from the heart.

Dr. Kelly Churchill

Dr. Allie Williams

Dr. Christianne Robertson