The importance of considering hearing needs in individuals with cognitive impairment

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Baycrest
INNOVATIONS IN AGING

UNIVERSITY OF TORONTO

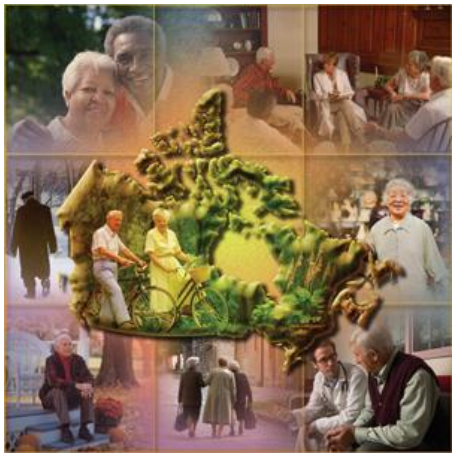
Overview

- Introduction to prevalence rates of cognitive impairment and hearing loss in the geriatric population
- Discussion of hearing loss and audiologic rehabilitation solutions
- Communication as a team effort

Census 2011: "Grey Glacier"

- Canada-wide, 4,945,055 persons aged 65+
  - 14.8% of the population

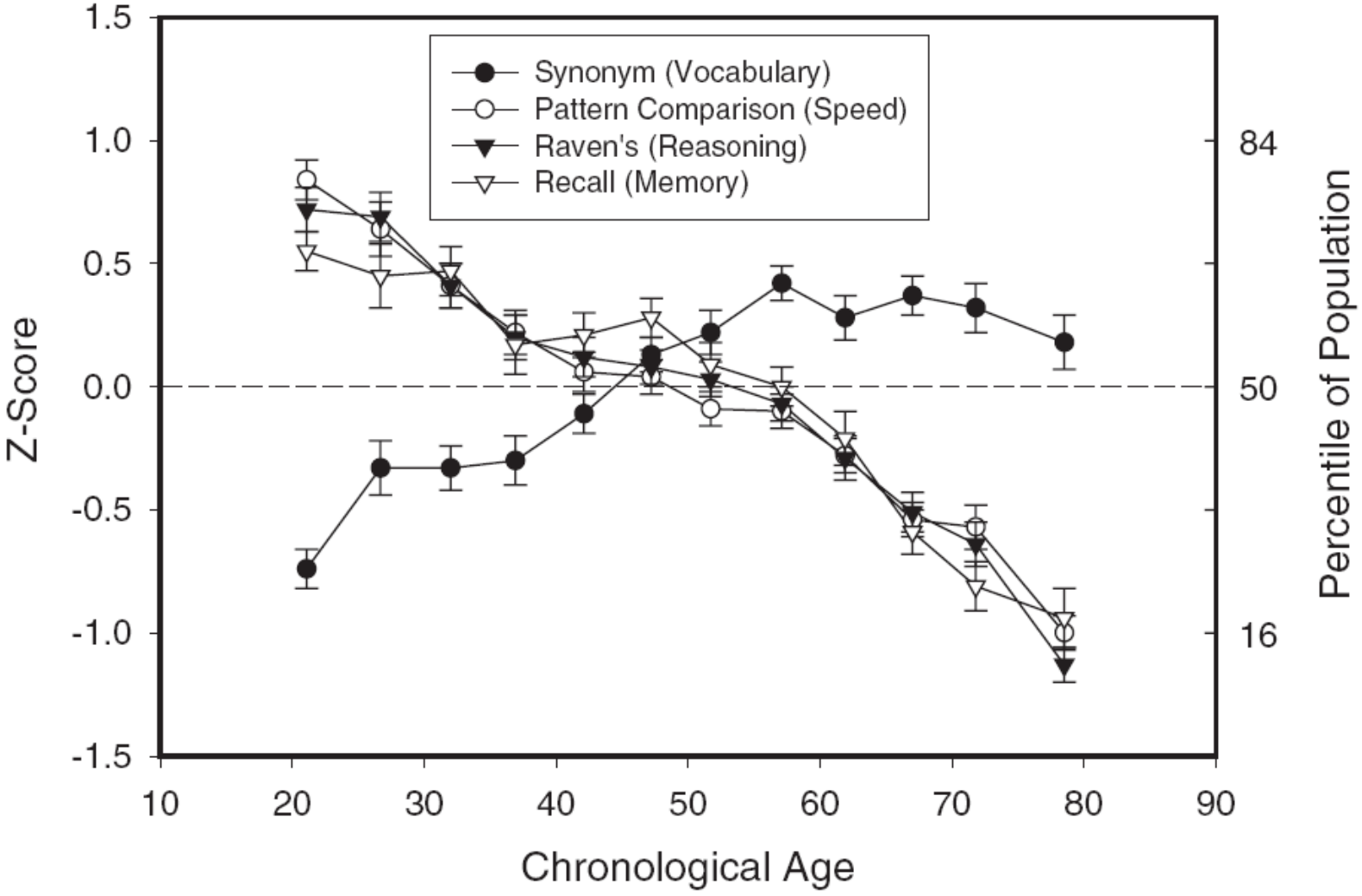
- Growing number of people who are aged 65 and older, what does this mean for the incidence of cognitive impairment and hearing loss?



Cognitive loss in aging

- Continuum from Normal Aging to Dementia

Normal aging



Salthouse, 2004

Mild Cognitive Impairment

- "Predementia phase of cognitive dysfunction" (Petersen et al., 2009)
- Memory complaint, preferably corroborated by an informant (e.g., caregiver, family member)
- Impaired memory function for age and education
- **Intact activities of daily living**

- Prevalence rates 10-20% over age 65
- (Anderson et al., 2012; Petersen, 2006; Roberts et al., 2008)

Mild Cognitive Impairment

- Rates of conversion to dementia: 10-15% per year
  - 80% conversion rate after 6 years (Petersen et al., 2001)
  - Time to intervene?

Dementia

- Prevalence of dementia
  - 1.5% of Canadians have dementia (2008)
  - Prevalence increases with age
    - Over 65: 7% in 2008, projected 9% in 2038
    - Over 90: 49% in 2008, projected 50% in 2038

- Rising Tide (Alzheimer Society of Canada Report, 2010)
  - Underlines medical, social, and productivity costs associated with growing number of people with dementia

Alzheimer's disease

- Alzheimer's disease (AD) is the most common form of dementia
- Gradual deficits in the ability to perform everyday tasks
- AD typically leads to impairments in higher order cognitive functions such as memory, language, and **communication**

Cognitive Loss	Untreated Hearing Loss
Social Isolation (Holman et al, 2000)	Social Isolation (Weinstein & Ventry, 1982)
Decreased comprehension (Pogacar & Williams, 1984)	Decreased understanding/discrimination (Dubno et al, 1984)
Repeating questions (Nyatsanza et al, 20030	Repeating questions (Katz, 2002)
Short-term memory problem (Miller, 1973)	Working memory problem (Salthouse, 1998)
Stereotyped/inappropriate word use (Nyatsanza et al, 2003)	Stereotyped/inappropriate word use (Tesch-Romer, 1997)
Difficulty following conversation (Bozeat et al, 2000)	Difficulty following conversation (Dalton et al, 2003)
Depression, anxiety (Bierman et al, 2007)	Depression, anxiety (Cacciatore et al, 1999)

Many of the behavioural consequences of cognitive impairment in older adults are very similar to those of untreated hearing loss

Prevalence of Hearing Loss

- Hearing loss is third most common chronic condition in older adults
  - 1/3 of persons over the age of 65

    (Minister of Public Works and Government Services Canada, 2006)
  - 1/2 of persons over the age of 85

    (Cruikshanks et al., 2010)

Link between hearing loss and cognitive loss

- Strong connection between sensory and cognitive function in old age

  (e.g., Baltes & Lindenberg, 1997; Lindenberger & Baltes, 1994)

- Age-related hearing loss is independently associated with cognitive impairment

  (e.g., Gurgel et al., 2014; Lin et al., 2011)

  - The likelihood of developing dementia is directly proportional to degree of hearing loss
  - The more severe the hearing loss, the greater the risk

Link between hearing loss and cognitive loss

- Potential explanations?
  - Specific cause
    - Cognitive
    - Fewer processing resources available to use in difficult listening environments
    - Underlying neuropathological process
  - Social isolation (“use it or lose it”)
  - Mood factors

Prevalence of concurrent hearing and cognitive loss

- Little research examining how many older individuals experience both hearing loss and changes to their thinking skills (e.g., memory, attention, language)

Prevalence in a community-based sample

- Research conducted at University of Toronto
- 301 older adults
  - Healthy, community-dwelling, recruited from newspaper ad
  - Average age 71 years

- Results
  - 36% neither hearing impairment nor cognitive impairment
  - 45% fail the hearing screen
  - 47% fail the cognitive screen
  - **28% fail both screens**

Dupuis et al., (under revision)

Prevalence in a clinical sample

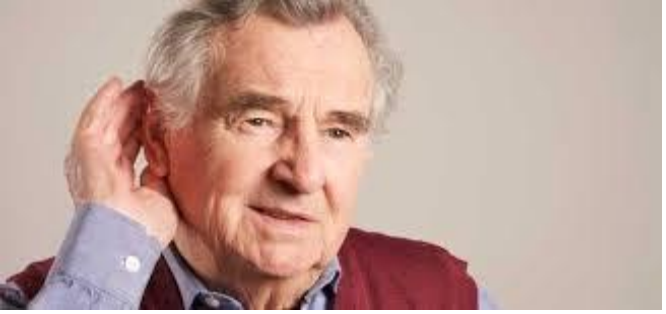
- Research conducted at Baycrest Audiology
- 47 older adults
  - Audiology patients purchasing a new hearing aid
  - Average age 84 years

- Results
  - 83% fail the cognitive screen

Keymanesh et al.

Age-related hearing loss

- What is age-related hearing loss?
- How can you know who has hearing loss?
- Why is it important to know whether or not someone has hearing loss?
- What strategies can we use to better communicate with those that have hearing loss?
- What resources are available for patients with hearing and cognitive declines?



Age-related hearing loss

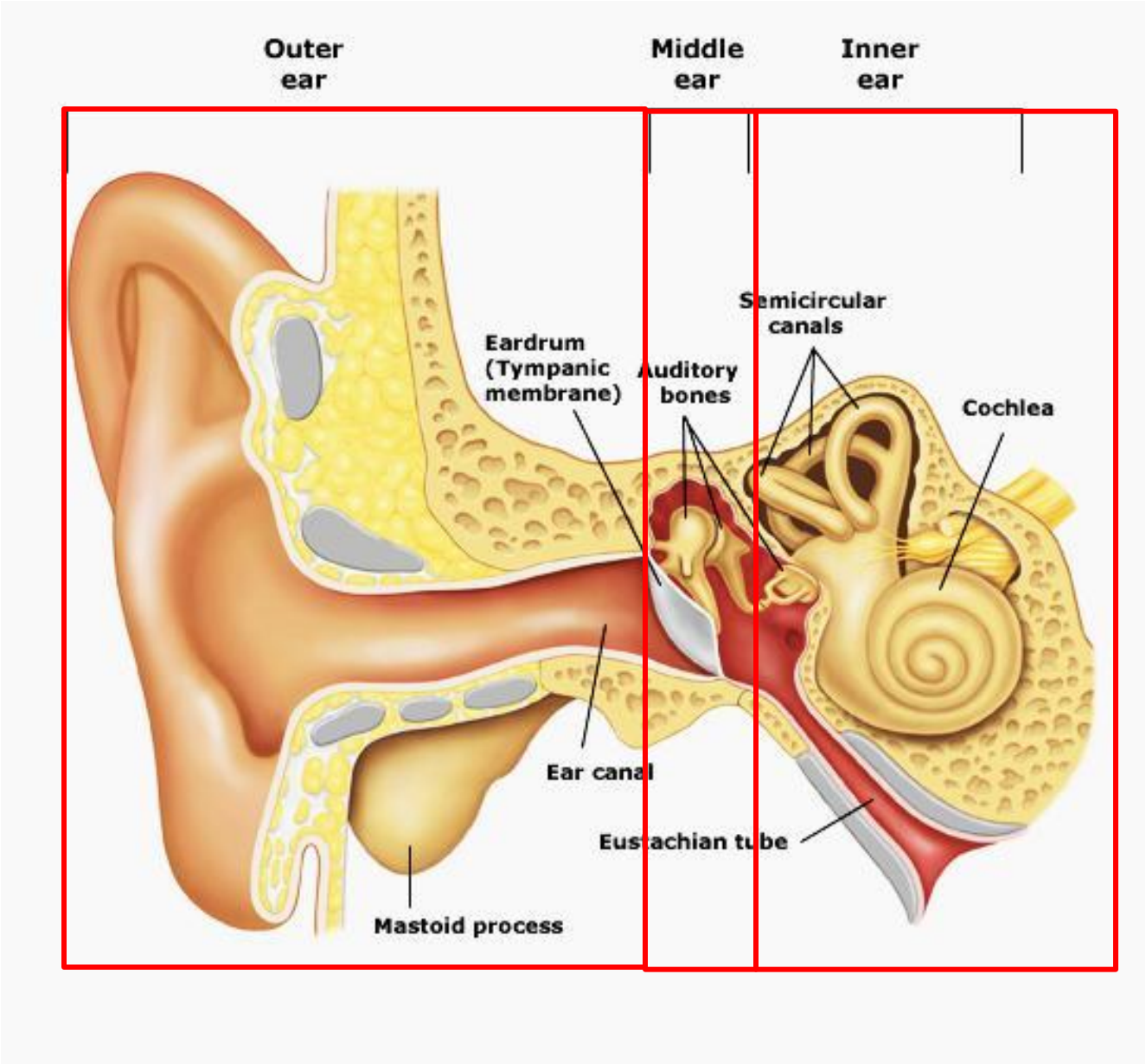
- Presbycusis: a slow progression of hearing loss that occurs with aging.
- Causes include:
  - Genetics
  - Exposure to loud noise
  - Ototoxic drugs
  - Diabetes, hypertension
  - Smoking, poor dietary habits

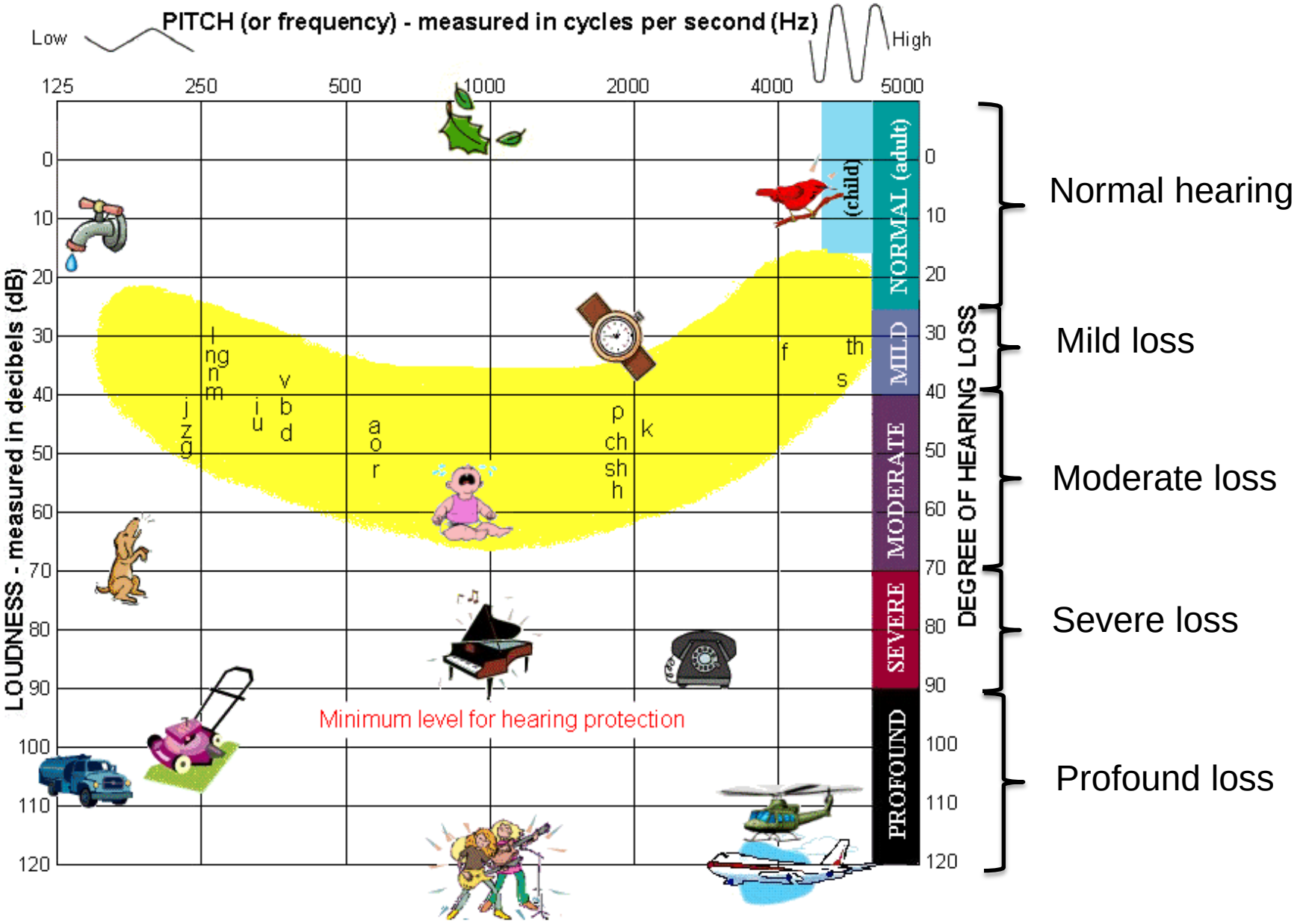
How do you know who has hearing loss?

Signs of age-related hearing loss

- Able to hear people speaking - difficulty ‘understanding’ the words
- Strain to understand conversation
- Frequent requests for repetition
- Complaints that others speak too fast
- TV/radio volume too loud for others
- Unable to hear over the telephone
- Able to hear better when wearing glasses
- Trouble following conversation when two or more people are talking

Structure & Function of the Ear: How do we hear?




PITCH (or frequency) - measured in cycles per second (Hz)
Low
High
125
250
500
1000
2000
4000
5000
LOUDNESS - measured in decibels (dB)
0
10
20
30
40
50
60
70
80
90
100
110
120
(child)
NORMAL (adult)
MILD
MODERATE
SEVERE
PROFOUND
DEGREE OF HEARING LOSS
Normal hearing
Mild loss
Moderate loss
Severe loss
Profound loss
Minimum level for hearing protection
j z g
l ng n m
i u
v b d
a o r
p ch sh h
k
f
th s

Age-related hearing loss

- Have to consider the **functional** effects of age-related hearing loss

- WHO – There are more people in the world with a disabling level of hearing than the entire population of the United States.

Effects of hearing loss on communication

- Asking for repetition makes those with hearing loss feel like a nuisance, and afraid of appearing stupid
- Bluffing/guessing what was said results in embarrassing mistakes
- Others' impatience and intolerance erodes confidence, and discourages communication

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Effects of hearing loss on daily living

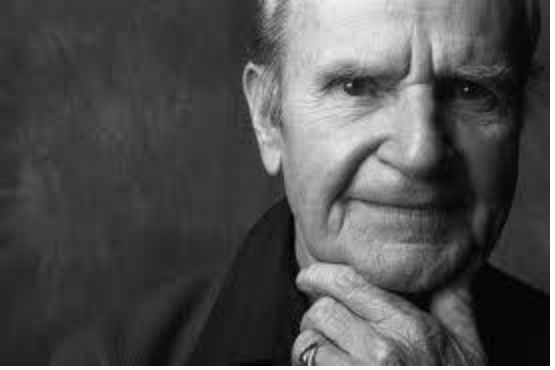
- Communication difficulties affect:
  - Personal relationships and socialization
  - Participation in health care
  - Emotional wellbeing
  - Cognitive function
  - Quality of life
- Compromises safety
- Reduces independence

Why must we be attuned to age-related hearing loss?

- Assessment
  - May confound performance on assessment measures
- Intervention and Management
  - Participation in consultation and decision making
    - Treatment planning and implementation
  - Consider ability to participate in intervention
  - May need additional follow-up

Seeking treatment for age-related hearing loss

- Refer to physician for possible medical issues (e.g., wax, infection, pathology)
- Refer to Audiologist for assessment and management:
  - Hearing test
  - Hearing aid/assistive device evaluation and prescription
  - Dispensing of device(s)
  - Hearing rehabilitation, individual or group



Reluctance to seek treatment

- Average wait time between being diagnosed with hearing loss and seeking help is 10 years
- Only 20% of older adults who might benefit from hearing aids use them successfully

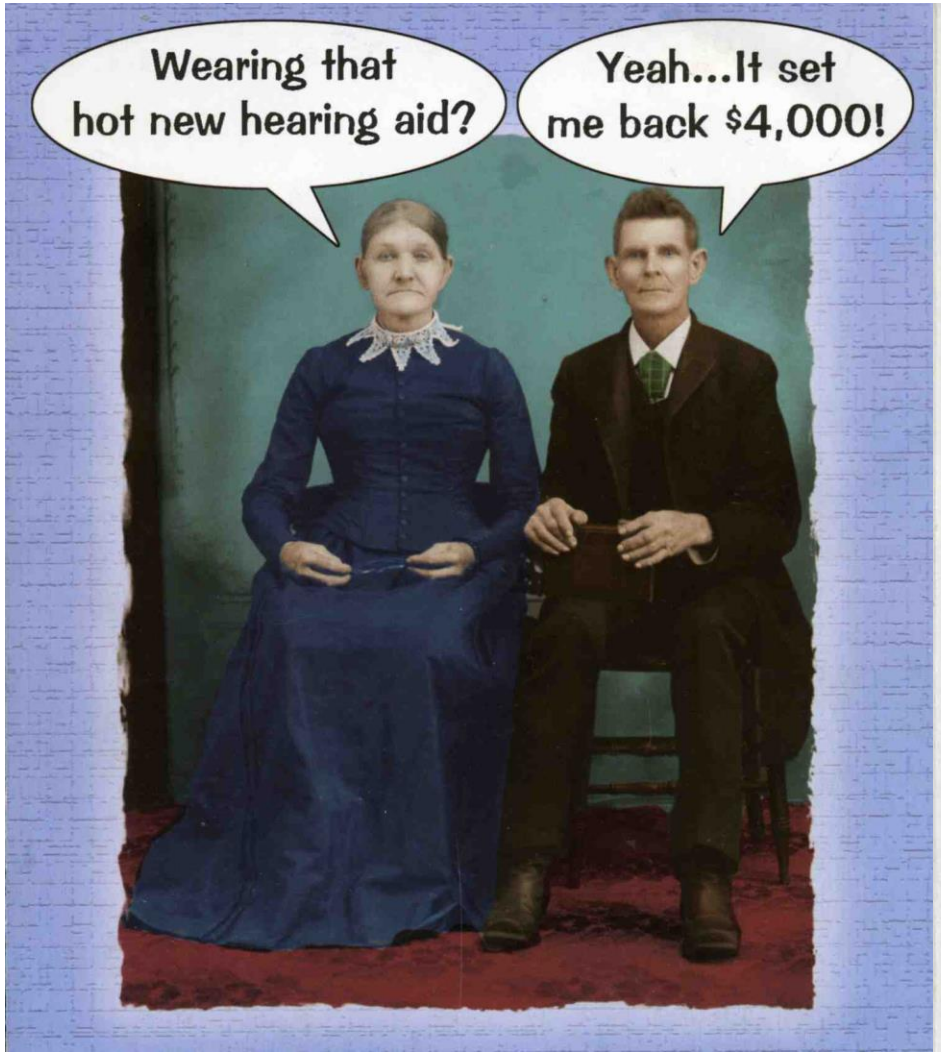
Barriers to managing hearing loss

- Invisible, insidious disability
- No need; just a ‘normal’ part of aging?
- Denial
- Stigma
- Misconceptions about treatment options
  - Patients and physicians
- Hearing loss as a low medical priority

- People with cognitive loss may be less likely to get help for hearing loss

Seeking treatment: Hearing aids

- Improve audibility
- Minimize listening fatigue (by reducing cognitive demands)
- Facilitate social participation
- Improve mood, well-being, and quality of life
- Possible benefit to cognitive function


Wearing that hot new hearing aid?
Yeah...It set me back $4,000!


Wow... what kind is it?
12:30

Auditory Rehabilitation: There is more to rehab than hearing aids!

- Though hearing aids still main treatment focus
  - Many patients/caregivers not interested
  - Limited success/benefit
- Goal of management: Effective communication

What can we do to minimize the impact of hearing loss?

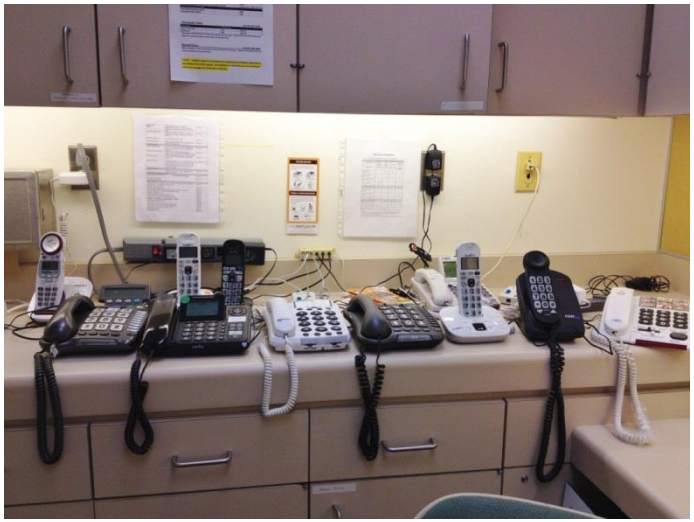
- Assistive technology
- Environmental modifications
- Communication strategies

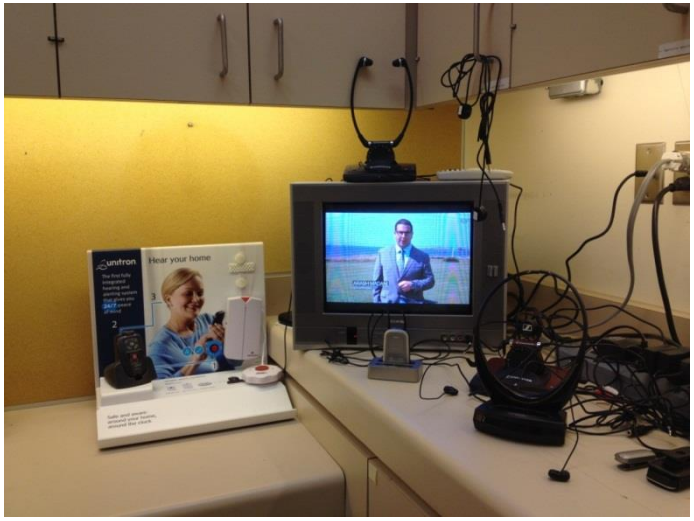
Assistive technology

- Assists auditory processing
  - By providing amplification
    - In noisy, reverberant environments
    - When speaker at a distance
  - By placing microphone close to sound source

- Personal amplifiers e.g. Pocket Talker and FM
  - Large and easy to manipulate
  - Robust and durable
  - Harder to lose!

Assistive technology:
Independent living and safety





Environmental modifications

- Quiet environments with minimal distractions
  - Reduce competing noise (music, other speakers, traffic)
  - Reduce reverberation
- Modify seating with respect to distance from speaker and background noise
  - Always sit facing talker

- Ensure good lighting for use of visual cues

Communication strategies

- Use ‘clear speech’
- Provide context for your conversation
- Paraphrase sentences you repeat
- Ensure that information has been heard correctly
- Attract the listener’s attention before speaking
- Use written materials, pictures and objects to facilitate understanding (supported conversation)
- Maximize use of visual cues

Communication strategies

- Talk **to** a hard of hearing person (not about them to another person)
  - Ask them how you can facilitate communication
- Allow them to express themselves
  - Avoid speaking on their behalf
- Help them build confidence and have a constructive conversation
- Be patient, maintain a sense of humor, stay positive and relaxed

Implications for interacting with older adults

- Awareness
  - Integrate assessment and understanding of hearing loss into everyday interactions with older adults

- Measurement
  - Observation
  - Questioning
  - Self-report questionnaires

Implications for interacting with older adults

- Communication takes two (or more!)
  - Family Members
  - Friends
  - Health-care providers
  - Caregivers

Social withdrawal and isolation

- Especially problematic in older adults
  - Individuals without strong support systems
  - Potential links to cognitive decline?

- Crucial to maintain community ties and access to communication partners

Third-party burden

- Disability experienced by an individual related to their communication partner's hearing loss (WHO, 2001)

- For individuals with normal cognition… hearing loss can strain relationships (Hallam et al., 2008)
  - Hearing loss in one member of a couple contributes to lower levels of well-being in the other member

    (Wallhagen et al., 2004)

- Cognitive loss can add to the degree of burden experienced by communication partners

Communicating in caregiving

- Communication difficulties are one of the most distressing problems reported by caregivers of people with dementia

  (Kinney & Stephens, 1989 ; Ripich & Honer, 2004)

- Breakdowns in communication can lead to frustration and difficulties in accomplishing everyday tasks

  (Orange, 1991; Savundranayagam et al., 2005)

Caregiver burden in dementia

- The majority of individuals with dementia live at home and are cared for by “informal caregivers”
  - Extensive literature on experiences of burden in caregivers of individuals with dementia
  - Impact on carers’ physical, psychological, and social function

  - Communication breakdown → caregiver burden

Caring for the caregiver

- We need stronger support and education programs for these informal caregivers

  (Institute for Research on Public Policy, 2011)

  - Alleviate burden
  - Increase efficiency of homecare → reduce costs

Potential benefits of hearing aid use in individuals with dementia

- Hearing aid provision can lead to….
  - Qualitative improvement in quality of life
    - e.g., Enjoying church more, speaking to wife and friends more
  - Reduction in problem behaviours
  - Stable caregiver burden over a period of 6 months
  - Improvement in caregivers' subjective ratings of their care recipients' hearing

<u>Most benefits for caregivers are secondary to gain in their care recipients' functioning</u>

Self-efficacy in caregivers

- If hearing care does fall on the caregiver… how can we involve them in all aspects of their care recipient's audiologic rehabilitation?
  - Individuals who are accompanied by a significant other may experience more improvement in their functioning than their solo counterparts (Preminger, 2003)
  - Spouses of individuals with normal cognition who attend audiologic rehabilitation programs may also experience reductions in their stress and negative affect

    (Preminger & Meeks, 2010)

Educating clinicians and caregivers

- Benefits of improved hearing
  - Reduce frequency of communication breakdowns
  - Improve feelings of self-efficacy
  - Benefits to mood and social involvement

- Research at Baycrest
  - Benefits of hearing aid use regardless of cognitive status

(Keymanesh et al)

Implications for policy and practice

- Screening programs
  - MTO aged 80+ driving evaluation
- Aging at Home strategy
  - Safety
  - Reduced care costs

Questions?