Age-Related Hearing Loss

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Hearing and Cognition

The ears are just the “way in” – making sense of sound happens in the brain. Ears with hearing loss do not provide the brain with what it needs to make sense of sound.
Demographic Revolution
Aging and Hearing Loss
Demographic Shift – An Older Society
Aging in the 21st Century

Older Adults are...

- Healthier
- Living Longer
- Retiring later
- Socially Engaged
- Politically Engaged
- Dedicated to Purposeful Lives
Healthy Aging

Keys to Healthy Aging (Simpson, Simpson & Dubno, 2015)
Public Health Challenges to Healthy Aging

21st Century Challenges

- Age-Related Hearing Loss
- Dementia
- Social Isolation
- Falls
Disability-Adjusted Life Years

- Life Expectancy minus
- Actual years lived accounting for
- Years lost due to chronic illness
Global Burden of Years Lived with Disability

Hearing Loss is now the 4th leading contributor to years lived with disability worldwide.

In 2010, it was the 11th.

Prevention is the most cost-effective way to reduce the high and growing burden of hearing loss.

Primary prevention could reduce prevalence by 50% or more in some world regions.
Healthy Aging?

HEARING LOSS RANKS 4th AMONG CHRONIC CONDITIONS IMPACTING HEALTHY AGING*

Social Participation
Autonomy
No Functional Impairments
No Cognitive impairments

Keys to Healthy Aging (Simpson, Simpson & Dubno, 2015)

*Global Hearing Healthcare: New Findings & Perspectives (Wilson et al., 2017)
The number of adults with hearing loss will DOUBLE in the next 4 decades!
Hearing Loss Affects all Conversations!

- Hearing Loss affects how we hear speech
  - Speech is our connection to others
  - Speech is what makes us human
  - Not being able to hear speech properly is a serious problem
Hearing Loss affects all Conversations!

- Age-Related Hearing Loss makes it difficult to hear certain speech sounds
- Vowel sounds are LOUD and low-pitch (these are not affected)
- Consonant sounds are soft and high-pitch (these ARE affected)

- Brain has to fill in the blanks, and does not always get it right
Communication is a Basic Human Right

Being able to communicate effectively is the most important of all life skills
Not being able to communicate effectively can be devastating.
Hearing Loss is Invisible

You cannot tell an individual who has Hearing Loss from someone who has normal hearing just by looking at them. Hearing Loss transcends gender, race, socio-economic status, wealth, etc.
The Many Signs of Age-Related Hearing Loss

- Conversation is an effort
- Missed opportunities for information, humor, emotional connection
- Difficulty remaining engaged socially
- Fatigued when socializing
- Cannot join in at restaurants due to the noise
- Problems with participation in groups
- Asks “What?” a lot
- Thinks people are mumbling
- Argues with people because information was misheard
- Feels left out, anxious, depressed, angry
- Cannot hear TV
- Trouble understanding on the telephone
- Issues making appointments by phone
- Mishearing the doctor, therapist, pharmacist
- Fear of falling
- Fear of going outside
Age-Related Hearing Loss: The Trajectory

Difficulty conversing

Increased difficulty listening in background noise/multiple talker scenarios and locations where acoustics are poor/degraded

Listening effort increases. Communication becomes even more challenging

Communication becomes fatiguing/significantly effortful. No longer motivated to participate; feelings of exclusion

Withdrawal from social situations; **Social Isolation**
Age-Related Hearing Loss

High Emotional and Physical Impacts
High Economic Burden

Under-Diagnosed
Under-Treated
Hearing Loss and Mortality (Genther, et al., 2014)

Hearing Loss is associated with a **20% increased risk of mortality** compared with normal hearing and independent of demographic factors.
Age-Related Hearing Loss: a Modifiable Risk Factor

- Social Isolation/Loneliness
- Falls
- Dementia
- Dependency
Social Isolation / Loneliness (Gopinath et al., 2012)

Age-Related Hearing Loss = poor communication / lost connection to others

Loneliness: 26% increased risk of premature death

Social Isolation: 29% increased risk of premature death

Impaired cognitive & physical function
Neuro-biological effects of stress and inflammation caused by poor social engagement
Falls (Centers for Disease Control)

1 in every 5 falls causes a serious injury:
- Broken bones
- Head injury
- Ongoing physical pain
- Bedridden/housebound

Unintentional Fall Death Rates, Adults 65+

2005 - 2014, United States
Unintentional Fall Death Rates per 100,000
All Races, Both Sexes, Ages 65+
Source: www.cdc.gov/injury/wisqars
Age-Related Hearing Loss and Falls

Age-Related Hearing Loss:
The organ of balance is housed within the organ of hearing and shares a neural network.

People with a self-perceived severe hearing handicap are at greatest risk of falls.

2.39 increased odds of falling (twice as likely)

Annually:
- 2.8 million older adults in the ER for fall injuries
- 800,000 patients hospitalized
- 300,000 hospitalized for hip fracture
- 95% of hip fractures are from falls
The Aging Brain & Hearing Loss (Lin et al., 2014)

- Significant atrophy (brain matter loss) happens across all brain regions over time, in all individuals as they age.

- Compared to individuals with normal hearing, those with hearing loss are seen to have faster atrophy in the whole brain, and in the Temporal Lobe, the area where speech processing occurs.

- Adversely affects cognitive performance as adds to brain pathology-regions important for memory and processing spoken language.
Hearing Loss – Greatest Chance for Prevention of Dementia due to High Prevalence

Dementia is the greatest global challenge for Social and Health Care

Dementia in the 21\textsuperscript{st} Century
Dementia is Costly!

A new case of Dementia is diagnosed every four seconds.

Dementia is the leading cause of dependency and disability among the elderly.

Disability Adjusted Life Years (DALYs) attributed to Dementia rose (82.6 percent) between 2004 and 2030.

If global dementia care were a country, it would be the 18th largest economy in the world exceeding the market values of companies such as Apple and Google.

In 2015: 47 million people living with Dementia worldwide. Number expected to double every 20 years; will reach 131.5 million in 2050.

Greatest Modifiable Risk Factor for Dementia: Hearing Loss

Lancet Commission: 35% of Dementia is Preventable

1. Hearing Loss – 9%
2. Less education – 7%
3. Smoking – 5%
4. Depression – 4%
5. Physical Inactivity – 3%
6. Hypertension – 2%
7. Social Isolation – 2%
8. Obesity – 1%
9. Diabetes – 1%

Simple health behavior changes could prevent a third of dementia cases
Age-Related Hearing & Dependency
(Schneider, et al., 2010)

Age-Related Hearing Loss:
People with Hearing Loss at least twice as likely to use formal support

Likelihood of relying on family or using community support increased with severity of Hearing Loss

Older adults with Moderate to Severe Hearing Loss had an **80% increased reliance** on support systems

Over a 5 year study, older adults with Hearing Loss more likely to:
- Self-rate their overall health as poor
- Report having fallen in previous year
- Have difficulty walking
- Have visual impairment, cognitive impairment

Reduced Independence
- Inability to go out alone
- Increased need for Community Support Services
Burden of Hearing Loss* on Quality of Life Outcome Measures (Hawkins, et al., 2012)

*Among Medicare Beneficiaries with Medigap
Hearing Loss and Health-Related Quality of Life (Simpson, et al., 2015)
Not being able to hear medical directives properly

Poses serious risks to health and safety
Hearing Loss has a Cost:

- Financial Costs
  - Lost Quality of Life
  - Costs related to use of Health Care & Social Services
  - Non-Health Care Related Services

- Health Outcomes
  - Doctor/Patient Communication
  - Treatment Adherence
  - Use of Health and Related Services

Safety

Hearing Loss Burden
Hearing Loss & Access to Health Care
(Pandhi et al., 2011)

Older adults with Hearing Loss were 1.85 times more likely to report difficulty or delay in obtaining care.

Hearing Loss is a barrier to accessing Health Care.
Hearing Loss & Hospitalizations (Genther, et al., 2013)

- Hearing Loss independently associated with hospitalization and poorer self-reported health over the 12 month period.

- First nationally representative study to demonstrate that Hearing Loss is independently associated with increased health care use and burden of disease among older adults.

Hearing Loss: More Frequent Hospitalizations 1.27 times more likely in Adults 70+ years

- Low Health Literacy
- Increased Burden of Disease
- Poorer Self-Rated Health
- Social Isolation
- Cognitive Decline
Among US Adults 65+ years who use hearing aids:

- Reduction in visits to the Emergency Room
- Reduced Hospitalization rates
- Shorter Inpatient Stays

Lower Total Medicare Expenditures BUT increased out of pocket expenditures

Hearing Loss, Hearing Aid Use & Health Care Costs (Mahmoudi et al., 2018)
Hearing Loss is associated with higher Health Care costs (inpatient, outpatient, hearing services, prescription medications)

Middle-aged US Adults 55-64 years

Matched cohort study: Hearing Loss vs. Normal Hearing

Hearing Loss Cohort: Higher mean Health Care payments

Hearing Loss Cohort: 33.3% higher costs over 1.5 years

Hearing Loss and Health Care Costs (Simpson, Simpson & Dubno, 2016)
The Financial & Societal Burden of Hearing Loss to Persons 65+ (Stucky, Wolf & Kuo, 2010)*

**Year 2002**
- $8.2 Billion nationally for cost of 1st year treatment
- Lost productivity cost attributable to hearing loss: $1.4 Billion nationally

**Year 2030**
- $51.4 Billion nationally for cost of 1st year treatment
- Lost productivity cost attributable to hearing loss: $9 Billion nationally

*Based on reimbursement costs in California for Medicaid beneficiaries*
Disparities in Hearing Health
Mahmoudi, et al., 2018)

HA USERS

Caucasian
More Affluent
Higher Educational Level
Greater English Fluency
Hearing Aid Users Older
Greater Hearing Loss
Older

Non-Users

Younger Age
Lower Income Level
Multi-morbidity
Lower educational Level
African American, Hispanic
Public Health Goals

- Primary Prevention: Reduce the incidence of Hearing Loss
- Secondary Prevention: Reduce the progression of Hearing Loss
- Tertiary Prevention: Treat Hearing Loss to reduce functional sequelae
Struggling to hear family & friends

Fatigued from effort and doesn't want to go out

Isolated, depressed and having difficulty with her memory
Ready to make a change! Feeling better after HA's & counseling
Becoming more involved & active
Feeling confident! Quality of life and cognition are improving!
Raise Awareness of Hearing Loss
Close The Gap: Take Action
Advocate for and Support People with Hearing Loss!
Thank You!

• Special thanks to my Visiting Scholar, Dr. Jennifer Gilligan, who Provided Superlative Assistance with Design of the Slide Deck!