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A Dementia Primer For Audiologists: (Hearing & Aging Series)

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Learning Outcomes

After this course, participants will be able to:

- List the causes and modifiable risk factors for dementia and the significant role of hearing loss in the equation.
- Describe the implications of the communication changes and behaviors that occur with dementia and their implications for audiologic practice.
- Explain the contribution of hearing interventions to dementia onset, dementia progression and brain health.
Demographic Shift – An Older Society

Children

Older Adults

Public Health Challenges – 21st Century

Age-Related Hearing Loss

Dementia

Social Isolation

21st Century Challenges
Dementia in the 21st Century

Hearing Loss – Strongest Modifiable Risk Factor and Greatest Chance for Prevention of Dementia due to High Prevalence

Dementia is the Greatest Global Challenge for Social and Health Care

Demographic Shift - Dementia Projections

2015 72 Million

2050 46 Million
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

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

- More than 90% of persons with dementia have hearing loss (Martini et al., 2015)
- Most persons with dementia and hearing loss do not use hearing aids: 21% (Nirmalasari, Mamo, et al., 2016)
What Is Dementia?
A group of symptoms affecting memory, thinking, behavior, and social activities severe enough to interfere with daily living and independent functioning
- Progressive
- Communication impaired
- Difficulty performing activities of daily living
- Impaired processing of emotional prosody
- Memory loss
- Personality changes
- Impaired reasoning

Not a Normal Part of Aging: The Trajectory
(Moga, et al., 2017)
The Trajectory

- Individuals with dementia experience a gradual transformation from an independent, fully functioning participant in their own life, to total dependence on others, oblivious to the world around them but need to communicate and to belong remains.

Psychosocial Needs Of Persons With Dementia
(Kitwood, 1997)

- Love, Comfort
- Physical, Emotional
- Attachment
- Security
- Inclusion and Occupation
- Ability To Communicate
- Identity
- Comfort
Communication

- The Ability to be Understood and to Understand Others
  - Involves use of a common system
  - Loss of memory impacts ability to remember words and their meaning
  - People with dementia have increased difficulty using words to express themselves and understanding what others are saying
  - When our ability to communicate is impaired our social history and networks are impacted

How To Communicate Needs

- Verbal
- Non-verbal – body language and tone of voice
- Written
- Visually
Components

Body Language  Words

Memory and Attention  Tone of Voice

COMMUNICATION

Three Parts Of Communication
(From Dementia Australia)

Words- 7%

Tone and Pitch of Voice- 38%

Body Language (55%)
Early Stage Communication

- Foster and support independence, individuality
- Accommodate for a shorter attention span
- Normalize day to day activities
- Do say – you may recall
don’t say – don’t you remember

Early Stage

- Individuals experience mild forgetfulness for names and objects, mild word finding, abstract reasoning, attention, language, and spatial cognition difficulties
Middle Stage Communication

- Forget logic and reason
- Provide choices
- Validate
- Distract and redirect

Middle Stage

- Moderately severe impairments in memory, language, judgment, and activities of daily living are apparent, thus increasing the need for assistance and surveillance by caregivers
Late Stage Communication

- Address need for comfort
- Use rhythm and music
- Do not talk about the person in front of them
- Assume what you are saying can be understood

Late Stage

- Loss of language (i.e., incoherent babbling or muteness) and decreased recognition of family and self, delusions, hallucinations, repetitive, and bizarre behaviors
Remember

- Dementia changes how people communicate, but they still have needs and feelings
- Needs can be communicated in many ways
- Be mindful of personhood
- Decrease in communication ≠ decrease in feeling

Brain Changes Caused By Dementia – The Seven A’s

- Amnesia - memory loss
- Anosognosia – no knowledge of disease
- Aphasia - loss of language
- Agnosia - loss of recognition
- Apathy - lack of interest
- Apraxia - impairment of motor skills
- Altered perception - visual perceptual impairment
Memory

- Dementia – prevents the brain from recalling memories, the memories are in storage but unable to call them up!

Memory Changes

Loss of the ability to use things memory can do for the person to enable them to live independently

- Short term – asking same question over and over again
- Long term
- Inability to learn
Changes In Cognition

- **Anosognosia** – No knowledge of having a disease – overestimation of abilities
  - Brain cells (right pre-frontal) change and there is a lack of awareness that a problem such as not remembering may exist

Anosognosia may range from:

- being slightly unaware to being completely unaware

slightly unaware  moderately unaware  completely unaware

Changes In Cognition

- Inability to apply the information one receives – Person may be looking at a book on the table but the visual information is not being translated so person does not know how to use the book
Changes In Cognition

- **Aphasia** – Loss of spoken language (middle stage - 40% of language lost)
  - Non-verbal Language Heightened
  - Behavior Communicates Needs

Agnosia

- Loss of recognition of what an object is, who people are and what things are used for
  - Safety implication
Apathy

- Lack of Interest:
  - Must capitalize on best time of day for patient function by asking family member about optimal time for appointment; keep appointments brief

Apraxia

- Impairment of fine and gross motor skills despite intact muscle power-loss of ability to carry out skilled movements and gestures, despite having the desire and physical ability to do so
- Problem with sequencing, hearing aid handling skills
Hearing Loss and Dementia: Under-diagnosed and Under-treated Conditions in Primary Care

Hearing Loss

Dementia

- Dementia – A complex, multi-factorial process; A group of syndromes characterized by a progressive loss of mental function severe enough to interfere with social and communicative function, performing everyday activities; impaired processing of emotional prosody is often present.

- Hearing Loss – An auditory-cognitive-based condition that interferes with communication, cognitive function, performing everyday activities; impaired processing of emotional prosody, impaired auditory encoding in the cochlea and impaired decoding in the brain.

Because of difficulty communicating and maintaining interpersonal relations there is a tendency to disengage from social interactions.
Hearing Loss and Dementia

- Occur insidiously and frequently unrecognized
- Hearing loss and cognitive decline are frequently attributed to aging
- Consequence of delayed recognition – 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 leaves greater cognitive reserve for remembering, responding, analyzing and even thinking
Risk Factors: Non-modifiable
(Galvin, 2017)

- Age
- Sex
- Family History

Modifiable Risk Factors

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
Hearing Loss and Dementia: The Risk
(Lin, et al., 2011)

- Hearing loss INDEPENDENTLY associated with incident, all-cause dementia (11.9 year fu)
- Risk of incident dementia is associated with baseline hearing loss
  - Risk increases with baseline hearing loss-severe hearing loss 5X more likely to develop dementia; mild HL 2X more likely

The Transition to Dementia and Hearing Loss
(Fritze, Et Al., 2016) (N=154,783)

- Presence of bilateral hearing impairment increases risk of an incident dementia diagnosis by 16% (6 year trajectory)
- Persons with bilateral hearing impairment experienced a faster incident dementia diagnosis compared to all other persons
Transition Time
(GURGEL, et al. 2014) (N=4463)

- Of persons with self reported HL at baseline 16.3% developed all-cause dementia as compared to 12.1% of those without HL
- Mean time to all-cause dementia was 10.3 years in the HL group vs. 11.9 years without HL
- Over time, persons with baseline hearing loss declined 54% faster than those without baseline hearing loss

Time Course (Davies, et al., 2017)

- Moderate self reported hearing difficulties and moderate to severe hearing loss are cross-sectionally associated with dementia
- Incidence of dementia (11 years) 39% higher in individuals with moderate self-reported hearing and 57% higher in those with poor self-reported hearing as compared to those with normal hearing after adjusting for multiple covariates
Why The Connection?

Cascade Model vs. Common Cause Model vs. Cognitive Burden vs. Multi-Level Model

Stahl, 2017

(Stahl, 2017)
Common Cause Postulate

- The loss of sensory input from hearing loss combined with cognitive decline from dementia derive from the same neurodegenerative process in the aging brain but one does not cause the other
- HI and cognitive decline share common age related change factors such as degeneration of the CNS

Cascade

- Prolonged reduction in hearing function lead to insufficient stimulation; the auditory deprivation (due to impoverished sensory input) cascades into decreased social interactions and into impoverished cortical sensory input which in turn cascade into cognitive decline/dementia
Do Our Interventions Work?

Conclusions on Efficacy of Sensory Interventions

- There is no direct effect of hearing aids on cognitive decline; rather, depressive symptoms and social isolation may mediate the association (Dawes et al., 2015; Amieva et al., 2015)

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

- Patients may feel less exhausted after an hour of socializing – and can engage more with family and friends

- There is a positive effect of implants on depression and cognitive status – and of HA use on depression and social and emotional loneliness (Castiglione et al., 2016; Weinstein et al., 2016; Boi et al., 2012)
Maharani, Dawes, Nazroo, et al. (2018)

- There was a decline in episodic memory (immediate and delayed recall; backward count) leading up to hearing aid use in ALL participants
- Rate of cognitive decline (episodic memory task) was slower in persons with hearing loss after they began using hearing aids (mean age of hearing aid use – 62 years); significant decline declined after hearing aid use
  - 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!!

**ROLES OF AUDIOLOGISTS WHEN WORKING WITH PEOPLE WITH DEMENTIA**
Earlier evaluations for memory concerns and related symptoms
Tailored intervention programs
Help caregivers accept their roles earlier in process
Help open patient’s eyes to condition and services available in the community
Home modifications, home monitoring for safety
Social engagement – partner relationships, daily life activities, managing hearing status

Provide tips regarding how to modify the environment for safety and security (flashing lights, etc.)
Review how to communicate effectively and use strategies that enhance communication
Help persons with hearing loss utilize assistive technology to facilitate communication, improve understanding, and reduce cognitive effort especially in group activities (e.g. cognitive training, physical activity) (Super Ear Plus by Sonic)
Intervention Philosophy

- Window of opportunity to intervene by addressing dementia risk factors may be middle age
- A life-course approach to hearing/communication
- Hearing intervention can facilitate clinical management
- Modifiable risk factor which may slow down transition to dementia

Management Goals

- Maintaining social engagement
- Maximize ability to communicate
- Reduce caregiver burden
- Optimize safety in the home
Take Aways & Thank You

MODIFIABLE RISK FACTORS FOR DEMENTIA
Some of these risk factors for dementia are social isolation, physical inactivity, depression, and possibly hearing loss.

ROLE OF HEARING INTERVENTIONS
Alleviate social isolation, physical inactivity, depression, and hearing loss by restoring communication abilities and allowing for cognitively stimulating activities.

HEARING AIDS MAY DELAY THE ONSET OF SENILE DEMENTIA
Hearing aids may delay the onset of dementia or cognitive decline in older adults because they promote social connectedness.

QUESTIONS
References


- Weinstein, B. A Primer on Hearing and Dementia. SIG 6, Vol. 3 (Part 1), 2018.