PART I

- Definitions of healthy aging, with a focus on social participation (Pichora-Fuller, Mick, & Reed, 2015)
  - World Health Organization’s International Classification of Functioning, Disability and Health (WHO’s ICF) (WHO, 2001)
    - Describe biopsychosocial model
  - Selective Optimization with Compensation model (Baltes and Baltes, 1990).
    - “Definitions of the meaning of success (in aging) have changed over historical time and will continue to vary along with changes in societal, cultural, and biological norms. Definition of outcomes, therefore, needs to be multidimensional and multilevel and needs to consider both gains and losses.” (Baltes & Carstensen, 1996)

- It is important to take a person-centered and holistic approach in the provision of healthcare to older adults, considering the full range of age-related changes in various domains including important gains, not just losses.
  - Cognition and communication across the lifespan include a combination of preserved functions and enhanced abilities (Institute of Medicine (IOM), 2015).
  - Large individual differences
    - There are substantial individual differences among older people in terms of cognitive and communication functioning, with some older people performing just as well as young people and others performing at a reduced level.
    - Clinicians should expect to see a wide range of cognitive and communication abilities among older adults.
  - Cross-cultural differences
    - Example: impact of culture on perceptions of hearing loss (Manchaiah et al., 2015)
  - Cognition as we age (e.g., Smith & Rush, 2006)
  - Communication as we age (e.g., Dubno, 2015; Yorkston, Bourgeois, & Baylor, 2010)
Hearing loss, mild cognitive impairment, and dementia are not inevitable consequences of a long life. Aging is only a risk factor.

- Impacts: from individual to society
  - Cognitive Impairment
    - Alzheimer’s disease, the most common form of dementia, is the 6th leading cause of death in the U.S. (Heron, 2013)
    - prevalence of dementia from all causes is between 5% and 7% of adults age 60+ (Prince et al., 2013)
    - About 12% of patients of patients with mild cognitive impairment will progress to dementia per year (Attix & Welsh-Bohmer, 2006)
    - Impact on individuals, families, society (leading cause of death, economic burden, caregiver burden)
  - Hearing Loss
    - 42-47% of adults age 65 and older have hearing loss in one or both ears, up to 2 out of every 3 adults over age 70 (Cruickshanks et al., 1998, 2015)
    - 25 to 30 million adults aged 50 years and older in the United States are affected by clinically significant hearing loss (Lin, Niparko, & Ferrucci, 2011)
    - the largest acceleration in hearing loss occurs between the ages of 70-74 and 75-79 (45.6% - 67.6%) (Lin, Thorpe, Gordon-Salant, & Ferrucci, 2011)
  - Hearing aid utilization rates (under-management)
    - Only about 15% of American adults age 50 and over with hearing loss use hearing aids (Chien & Lin, 2012)
    - only a fifth of individuals who could potentially benefit from amplification actually seek help, and 16.2% of people who purchase a conventional hearing aid do not use them (Kochkin et al., 2000)
  - Impact on individuals, families, society (e.g., Lustig & Olson, 2014)

- Connections between hearing loss and health
  - Research on dementia
    - Hearing loss has been independently associated with accelerated cognitive decline and incident cognitive impairment (Lin et al., 2013; Lin et al. 2011). Recent evidence suggesting an association between hearing and cognitive functioning is weak, but significant, in several domains (processing speed, executive function, memory, global cognitive status; Bush et al., 2015).
    - The risk of incident all-cause dementia has been shown to increase with the severity of hearing loss, even after controlling for demographic and health risk factors (Lin et al., 2011).
  - Research on social relationships and psychosocial health (Kramer et al., 2002; Li et al., 2014; Mick, Kawachi, & Lin, 2014; Scarinci, Worrall, & Hickson, 2008; Weinstein & Ventry 1982)
  - Research on activities of daily living and falls (Dalton et al., 2003; Lin & Ferrucci, 2012; Viljanen et al., 2009)
• Proposed theoretical connections between hearing loss and cognition in the literature (Pichora Fuller, Mick, Reed, 2015; Lin & Albert, 2014)
  o Increased cognitive load
  o Changes to brain structure and function
  o Social disengagement
  o Common cause

• Emerging ideas in the context of healthy aging
  o Individual differences (personality, resilience, communication need, strategy use; dual-sensory loss, other health conditions)
  o Influence of societal stigma
  o Is hearing loss a modifiable risk factor for adverse cognitive and health outcomes?
    ▪ What we know so far:
      ● Some evidence that hearing aids can impact cognitive outcomes in the short term, but limited amount of studies looking at long-term hearing technology use and cognition (Kalluri & Humes, 2012)
      ● Older adults who use amplification have better emotional and social well-being (Appollonio et al., 1996; Cacciatore et al., 1999; Mondelli, & de Souza, 2012; Weinstein, Sirow & Moser, 2016)
      ● Use of amplification can significantly reduce “problem behaviors” in older adults with dementia (Palmer et al., 1999)
      ● Benefits in quality of life for both the individual and the significant other following hearing aid fitting (Stark & Hickson, 2004)
      ● Scientific evidence supports cochlear implantation as safe and effective intervention in older adults with severe to profound hearing loss (Clark et al., 2012)
    ▪ What we want to know:
      ● Preliminary evidence suggests that hearing aids may attenuate cognitive decline associated with hearing loss, but many factors need to be well-controlled in future research (Amieva et al., 2015)
      ● Cochlear implants improve communication, quality of life, and social functioning, but there is little research on the effects of cognitive functioning after implantation (Miller et al., 2015)
      ● Aging, Cognition, and Hearing Evaluation in Elders Study at Johns Hopkins University (ACHIEVE-P ClinicalTrials.gov identifier: NCT02412254)

PART II

• Prevention and early intervention
  o Comprehensive case history/clinical interview
    “Going beyond the information gathered in a traditional audiologic assessment, information about nonaudiometric factors concerning relevant aspects of an individual’s physical, mental, and social health would be needed to plan effective hearing health care in the broader context of healthy aging.” (Pichora-Fuller, Mick, & Reed, 2015, p.)
  o Importance of interprofessional practice – case discussion
Navigating differential diagnosis

- Expectations – take a systematic, not stereotyped, approach
  - Case discussion

- Red flags?
  - Case discussion

- Screening measures (self-report and objective measures)
  - Hearing
    - When to administer
    - Best practices and pitfalls (example: testing conditions)
    - Next steps for client
  - Cognition
    - When to administer
    - Best practices and pitfalls (example: testing conditions)
    - Next steps for client
  - Case discussion

- Impact of hearing ability on common tests of cognitive ability
  - Cognitive ability may be underestimated if sensory loss is not considered (Dupuis et al., 2015)
  - Case discussion

Interventions and strategies to support communication, cognition, and psychosocial health capitalize on an individual’s strengths/abilities, environmental supports, and social supports

- Communication:
  - Rehabilitation strategies in the receptive communication domain are based on improving access to sound, changing the environmental conditions to support communication, increasing social support, and changing communication behaviors to increase self-efficacy and manage the effects of hearing loss on communication and quality of life.
  - Case discussion

Take-home tips on communication for clients and families:
  - Speak slowly
  - Use keywords; repeat what you could hear
  - Give the topic; content helps fill in the gaps
  - Get attention first
  - Rephrase; repeat once and then rephrase
  - Walk before you talk; be face to face

  - See attached “On the road” handout developed by the Living WELL with Hearing Loss Program at The University of Arizona in collaboration with the American Speech-Language-Hearing Association
On the road to living well with hearing loss, follow simple strategies to keep communication moving forward.

COMMUNICATION
a two-way street

Hearing loss affects the lives of 48 MILLION individuals in America

These are the highest rated strategies used by people in the Living WELL With Hearing Loss groups at the University of Arizona.*

*Marrone, Durkin, & Harris. The ASHA Leader (Dec., 2012)
Cognition:

- Rehabilitation strategies in the cognitive domain are based on the use of preserved or enhanced functions with age, which can be used to compensate for losses, for example, knowledge, sense of self, and lifetime experiences.
- Case discussion
- Comprehensive resource and scientific review of the evidence for providers on cognitive aging, (Institute of Medicine (IOM), 2015) [http://nationalacademies.org/hmd/reports/2015/cognitive-aging](http://nationalacademies.org/hmd/reports/2015/cognitive-aging)

**Take-home tips on cognition for clients and families:**

- Complete one task at a time before moving on to something else.
- Eliminate background distractions whenever possible.
- Use immediate feedback and clear, systematic instructions, especially during the completion of new or complex tasks. Repetition of information may be helpful.
- Good rest, stress management, and proper nutrition and hydration are important, as fatigue, stress, illness, and metabolic dysfunction will exacerbate any cognitive problems.
- Individuals with cognitive impairment generally function best in a well-structured and organized environment.
- Use external memory aids like calendars and alarms to provide cues and orientation to events.

Psychosocial health:

- A number of effective psychosocial interventions are available for older adults seeking treatment for mental health concerns like depression and anxiety. Age is not an obstacle to therapy, but “…treatment providers should consider appropriate adaptations for medical comorbidity, cognitive and sensory impairment, caregiver inclusion, and realistic modification of treatment goals” (Kennedy & Tannenbaum, 2000). See also (Knight, B. G. (2004). *Psychotherapy with older adults*. Sage Publications)
- Incorporating meaningful social activities is important in maintaining optimal psychological and cognitive functioning in older age. Social support has also been shown to promote hearing aid satisfaction (Seeman et al, 2001; Singh, Lau, & Pichora-Fuller, 2015)

**Take-home tips on wellness for clients and families:**

- Consider incorporating mindfulness and/or relaxation strategies to promote general wellbeing
- Maintain a balanced diet and healthy weight
- Address sleep concerns with medical professionals
- Engage in regular physical exercise
- Nutrition and exercise advice from the National Institute of Aging can be found at [https://go4life.nia.nih.gov/](https://go4life.nia.nih.gov/)
REFERENCES


