



# **Effects of Aging on Communication, 2nd Edition**

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# Purpose Statement

- This course is intended for allied health professionals who care for aging adults. The course reviews the components of communication, including voice, hearing, speech, language, and cognition, and the effect that aging has on each area. Learners will also gain strategies for assessment and treatment and counseling families.

# Areas We Will Discuss



Hearing



Voice



Speech



Language



Cognition

# Self-Assessment: Fact or Fiction?

**Most people lose their cognitive skills as they age.**

# Self-Assessment: Fact or Fiction?

**Most people lose their cognitive skills as they age.**

**Fiction**

# Self-Assessment: Fact or Fiction?

The human brain weighs 8 pounds.

# Self-Assessment: Fact or Fiction?

The human brain weighs 8 pounds.

**Fiction; it weighs 3 pounds**

# Self-Assessment: Fact or Fiction?

**Alzheimer's causes the brain to shrink.**

# Self-Assessment: Fact or Fiction?

**Alzheimer's causes the brain to shrink.**

**Fact**

# Self-Assessment: Fact or Fiction?

**You cannot teach a patient with dementia new skills.**

# Self-Assessment: Fact or Fiction?

**You cannot teach a patient with dementia new skills.**

**Fiction**

# Self-Assessment: Fact or Fiction?

Reading is often preserved in patients with mid-stage dementia.

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Reading is often preserved in patients with mid-stage dementia.

**Fact**

# Self-Assessment: Fact or Fiction?

Therapy for patients with dementia is reimbursable.

# Self-Assessment: Fact or Fiction?

Therapy for patients with dementia is reimbursable.

**Fiction**

# Hearing

# Hearing: The Aging Ear

- **Two functions**
  - Hearing
  - Balance (vestibular system)
- **Middle ear**
  - Connects eardrum to inner ear
  - Three ossicles
- **Outer ear**
  - Pinna
  - Conchae
  - External auditory meatus
  - Tympanic membrane

# Hearing: The Aging Ear

- Age-related hearing loss (ARHL) and age-related vestibular loss (ARVL) are common (Paplou et al., 2021)
  - 25% risk at age 40 up to 55% by age 75
- ARHL is most common sensory loss in aging (Bowl & Dawson, 2019)
- Most presbycusis is sensorineural (NIH, 2024)
- Tinnitus is common
- Bilateral, high frequency loss (4000-8000 Hz)
  - What sounds are high-frequency?
  - Background noise

# Strategies for Communicating with Persons with Hearing Loss

- Get the person's attention
- Face the person
- Visual aids
- Enunciate clearly
- Watch your "jargon"
- Reduce background noise
- Rephrase if misunderstood
- Review key points of conversation
- DON'T use elderspeak!

# Self-Assessment Question

Which of the following is best practice when communicating with someone with hearing loss?

- A. Yell**
- B. Use elderspeak**
- C. Communicate in a noisy environment**
- D. Face the person and enunciate clearly**

## Self-Assessment Question

Which of the following is best practice when communicating with someone with hearing loss?

**D. Face the person and enunciate clearly**

**Voice**

# The Aging Voice

- Presbyphonia
  - Normal aging voice
  - Changes in laryngeal function
  - Resonance
  - Respiratory support is crucial (Desjardins et al., 2022)
  - Difficult to quantify perceptually (Santos et al., 2023)
  - Changes in fundamental frequency (Rojas et al., 2020)
  - Changes in quality are normal

# Factors That Affect the Aging Voice

- Dentition loss
- Oral, laryngeal, and glottal muscles weaken
- Vocal folds weaken
- Laryngeal cartilage ossifies
- Declining respiratory strength
- Xerostomia
- Increased thickened mucous in glottic space

# Etiologies of Voice Disorders

- Laryngitis
- Reflux
- Superior laryngeal nerve palsy
- Vocal cord paralysis
- Vocal fold lesions
- Spasmodic dysphonia
- Cancer

# Voice Disorders in Elderly

- Higher likelihood in professional voice users (Azari et al., 2022; Oliviera et al., 2022; Barbosa et al., 2021)
- Signs and symptoms:
  - Prolonged hoarseness
  - Constant throat clearing
  - Throat or neck pain when phonating
  - Breathy voice
  - Quivery voice
  - Difficulty with speaking and breathing patterns

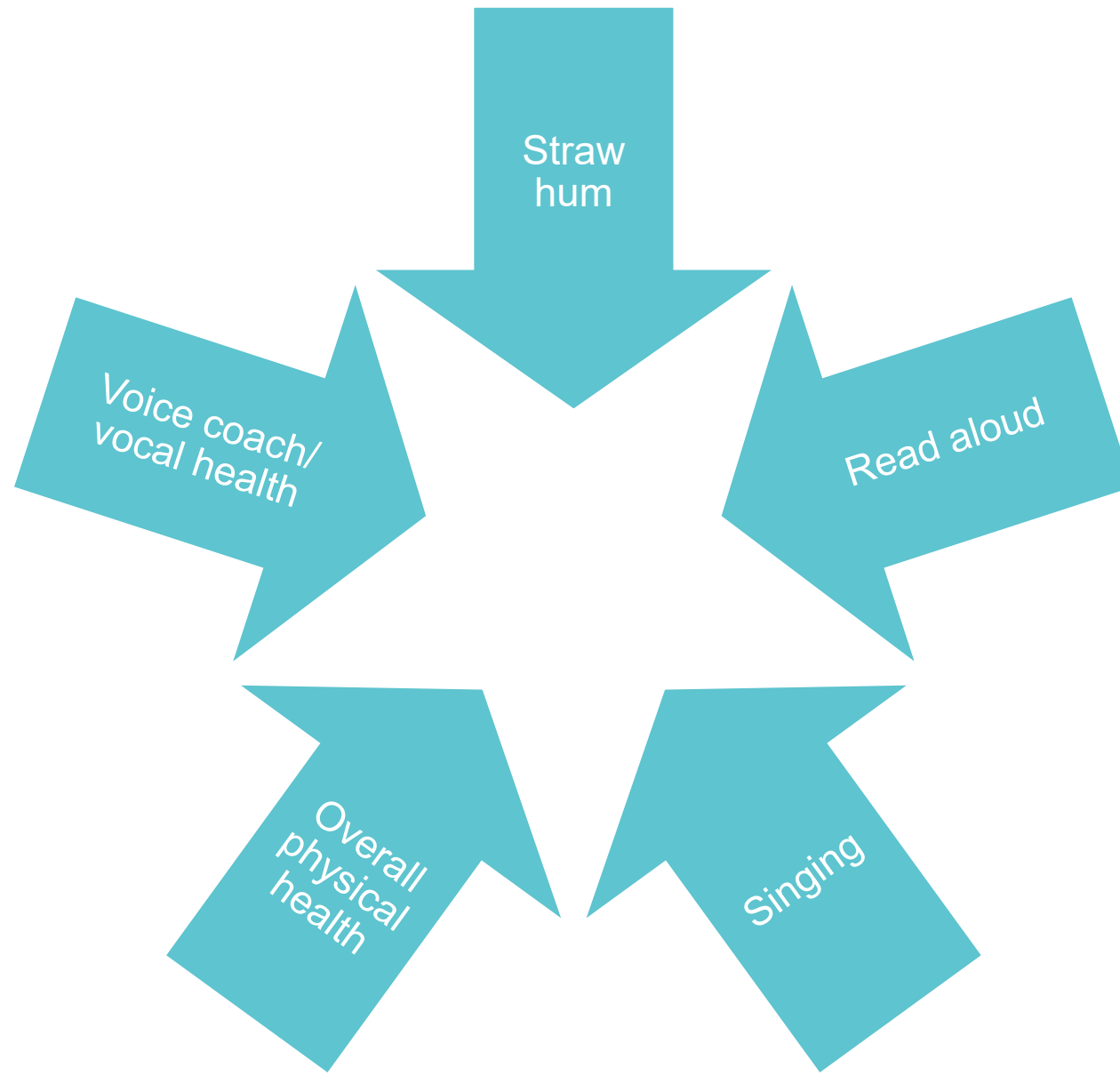
# Strategies for Vocal Hygiene in Older Patients

- Hydration!
- Behavioral modification
  - Avoid excessive throat clearing
  - Decrease vocal straining
- Minimize exposure to irritants
  - Tobacco
  - Medications
  - Alcohol
  - Pollutants

# Strategies for Vocal Hygiene in Older Patients *(continued)*

- Minimize reflux
  - Medication
  - Reflux precautions
  - Dietary changes
  - Weight loss

# Exercises to Maintain Normal Voice



# Voice Therapy Delivery



Adherence to therapy protocols (Torbes et al., 2020)



Education at time of evaluation!



Telepractice vs. face-to-face (Lin et al., 2020)

No significant differences in progress

# Speech

# Components of Speech



Respiration



Phonation



Resonance



Articulation



Prosody

# Normal Aging Factors: Speech

- Respiration
- Phonation (Karrison & Hartelius, 2021)
- Resonance
- Articulation (Rishiq et al., 2020)
- Prosody

# Case Study

Mr. Brown has a diagnosis of chronic obstructive pulmonary disease (COPD). Which component of speech is likely *most* effected by his condition?

- A. Respiration
- B. Phonation
- C. Resonance
- D. Articulation

# Case Study

Mr. Brown has a diagnosis of chronic obstructive pulmonary disease (COPD). Which component of speech is likely *most* effected by his condition?

**A. Respiration**

# Evaluation of Speech Disorders

- Case history/interview
- SLP led evaluation (subjective/perceptual)
  - Oral peripheral exam
  - Speech assessment
  - Connected speech sample
  - Assessment of phonation, quality, pitch, variability, resonance, etc.

# Evaluation of Speech Disorders *(continued)*

- Instrumental assessment (less likely)
  - Aerodynamic analysis
  - Acoustic analysis
  - Nasality
  - Articulation
  - Speech signal assessment

# Etiologies of Speech Disorders

- Alzheimer's disease
- Parkinsons
- Other neurological conditions
- Laryngeal pathologies
- Motor speech disorders
  - Dysarthria
  - Apraxia

**Helpful Hint:**  
**Dysarthria vs. Apraxia**

# Treatment Options for Speech Disorders

- Patient and family education
- Breath support for speech
- Vocal hygiene and VF exercises
- Exaggerated speech, script training, melodic intonation therapy
- Exercises for increased muscle use
- Slow rate
- Augmentative/alternative communication

## Case Study

**Mrs. Hamilton is a 70-year-old female with a history of stroke 2 months ago that presents with motor speech difficulties. During the assessment, the speech-language pathologist asks Mrs. Hamilton to recite a passage with faster speech. This causes her intelligibility to decrease. What does this likely indicate a diagnosis of?**

- A. Apraxia**
- B. Dysarthria**

## Case Study

**Mrs. Hamilton is a 70-year-old female with a history of stroke 2 months ago that presents with motor speech difficulties. During the assessment, the speech-language pathologist asks Mrs. Hamilton to recite a passage with faster speech. This causes her intelligibility to decrease. What does this likely indicate a diagnosis of?**

### **A. Apraxia**

Apraxia will present with decreased intelligibility, while dysarthria will present with increased intelligibility when rate is increased.

# Language

# Language vs. Cognition

Language and cognition are intertwined

“Cognitive communicative” or “cognitive communication” disorders

# Changes in Language

- May be less obvious to the casual observer
- Most changes noticed with word finding or comprehension
- Changes in perceptions of language

# Components of Language

- Phonology
- Morphology
- Semantics
- Syntax
- Pragmatics

# Components of Language



Phonology



Morphology

# Components of Language

- Semantics (meaning)
  - Vocabulary recognition
  - Storage of new information (strategies)
  - Word retrieval speed and accuracy

# TOT Experiences

- “Tip of tongue” experiences
  - Increased in older adults
  - Proper nouns (names) affected more than common nouns
- Mixing elements of words also increases
  - Phonological and motor planning for semantic content

# Components of Language

- Lexicon is a component of semantics
  - Words and meanings

# Components of Language

- Syntax (word order: meaningful language)
  - Basic syntax
  - Complex processing
  - Distractors or increased speech rate
  - “Holding” beginnings of sentences

# Components of Language

- Pragmatics
  - Variable throughout aging
  - Elderspeak (inappropriate accommodations)
    - Elderly person may become frustrated and avoid future interaction

# Components of Language

- Discourse is a component of pragmatics) (conversation, expanded/extended language)
  - Emotional and interpersonal factors
  - More personalized stories/emotional themes
  - Changes in topic of choice
  - Varied abilities to hold long conversations
  - Types of discourse
    - Narratives (personal stories)
    - Procedural (instructions)
    - Expository (informing)
    - Conversation (in social situations)

# Self-Assessment

Which component of language deals with turn-taking and other social aspects?

- A. Phonology**
- B. Morphology**
- C. Syntax**
- D. Pragmatics**

**Which component of language deals with turn-taking and other social aspects?**

## **D. Pragmatics**

Pragmatics includes social activities, such as turn-taking. It also encompasses discourse.

# Disorders of Language



Aphasia: decreased ability to use language: understand, speak, read, and write



Aphasia characteristics are linked



Nature



Extent



Location of damage



Pre-existing deficits

# Aphasia

- Paraphasias:
  - Phonological paraphasia
  - Semantic paraphasia
  - Neologistic paraphasia
- Agrammatic speech: lacks connecting words
- Paragrammatism: extraneous words added
- Anomia: Inability to name

# Common Types of Aphasia

- Broca's aphasia
- Wernicke's aphasia
- Anomic aphasia
- Global aphasia

## Case Study

**Ben is a 70-year-old male with a recent stroke. His receptive skills are within functional limits, but his expressive skills are severely impacted. Ben can only say the word “boy” and uses the word repetitively when trying to make sentences or describe his wants/needs or repeating words. What type of aphasia does Ben have?**

- A. Broca’s aphasia**
- B. Wernicke’s aphasia**
- C. Anomic aphasia**
- D. Global aphasia**

## Case Study

**Ben is a 70-year-old male with a recent stroke. His receptive skills are within functional limits, but his expressive skills are severely impacted. Ben can only say the word “boy” and uses the word repetitively when trying to make sentences or describe his wants/needs or repeating words. What type of aphasia does Ben have?**

**A. Broca’s aphasia**

# Assessment Areas of Language

- Auditory comprehension
- Spontaneous speech
- Verbal expression
- Written language
- Other

# Treatment–Language Deficits

- Stimulation approach
- Cognitive intervention
  - Convergent naming
  - Divergent naming
- Social approach
  - Partner and conversational coaching
  - Group treatment
- Environmental intervention
  - Take away distractions or deterrents
  - Teach family to minimize distractions

# Treatment–Language Deficits

- Intensive treatment approach
- Language specific intervention
- Classification and/or behavior specific intervention
- Computer-based treatment
- Alternative and augmentative communication

# Treatment

- Caregiver interventions
  - Education
  - Counseling
  - Identification of communication breakdown
  - Validation of feelings
  - Support (ongoing)

# Cognition

# Normal Factors of Aging on Cognition

- Brain plasticity continues in adulthood
- Brain volume slightly decreases (more after age 60)
- Information processing skills slightly decrease (memory)

# Types of Memory

- Short-term memory
- Long-term memory
- Implicit (nondeclarative) memory
- Procedural memory
- Explicit (declarative) memory
  - Episodic memory
  - Semantic memory

# Mental Stimulation: Can You Slow Decline?

- Reading
- Writing
- Create a list and try to recall
- Learn a new skill or hobby
- Crossword puzzles
- Board games
- Card games
- Group discussions
- Music
- Current events recollection

# Dementia

- Not a specific disease, but a group of symptoms
- Characterized by a loss of function in at least two areas of function
  - Language
  - Judgment
  - Memory\*\*
  - Spatial ability
  - Visual ability
- Two primary categories
  - Reversible
  - Nonreversible

# Unrecognized Cognitive Impairment

- Increasing evidence of unrecognized dementia
- Potential implications of unrecognized impairment may include:
  - Decreased safety
  - Potential for catastrophe
  - Irreversibility/inability to slow progress

# Global Deterioration Scale

- Seven stages
  - GDS 1: Normal adult
  - GDS 2: Forgetfulness
  - GDS 3: Early Confusional State
  - GDS 4: Late Confusional State (Mild Dementia)
  - GDS 5: Moderate Dementia
  - GDS 6: Severe Dementia
  - GDS 7: Late/Severe Dementia

# Prevention

- Cognitively stimulating activities
- Education and training for healthcare providers (to interact appropriately)
- Communication programs for older adults to maintain language

# Recap



Hearing



Voice



Speech



Language



Cognition



# **You have completed the course:** Effects of Aging on Communication

Thank you!