Technology in Geriatric Practice: Focus on Cognition, Communication, and Swallowing

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Objectives

• Describe the impact of the “Baby Boomers” on geriatric SLP clinical practice areas and practice settings
• Describe the utilization of technology in geriatric clinical practice areas in differing practice settings
• List at least 3 types of technological systems being used in geriatric SLP clinical practice

Impact of the Baby Boomers

• The “Baby Boomers”
  – > 75 million people world-wide
  – Nearly 1/3 of US population
  – American Hospital Association (AHA) report findings
    • Significant impact on healthcare
    • Over 65 population will triple
    • First baby boomer turning 65 in 2011
    • 37 million boomers will manage > 1 chronic condition by 2030

(Afable, R. et al. 2007)
Geriatric Practice Settings

- Nursing Homes
- Continuous Care Retirement Communities (CCRC)
- Assisted Living Facilities
- Independent Living Centers
- Outpatient Centers
- Home Health Services in Home/Apartments

Technology in Geriatric Practice

- Interesting facts:
  - As early as 2011:
    - > 65 million Americans owned a smartphone
  - At least 1 of every 5 patients uses a handheld device
    - Smartphones
    - Tablets

(Dunham, 2011)
Technology in Geriatric Practice

- Mobile Devices and Apps
  - Advantages in BOTH Education and Geriatric Practice Settings:
    - Improved Communication
    - Cost Saving
    - Progress Monitoring
    - Adaptability
    - Motivation
    - Internet Access
    - Support tools

ASHA Website: [http://www.asha.org/SLP/schools/Applications-for-Speech-Language-Pathology-Practice.htm](http://www.asha.org/SLP/schools/Applications-for-Speech-Language-Pathology-Practice.htm)

Technology in Geriatric Practice

- Mobile Devices and Apps
  - Disadvantages in BOTH Education and Geriatric Practice Settings:
    - Initial Cost
    - Connectivity

Technology in Geriatric Practice

- Technology in Clinical Practice:
  - Assessment**
  - Treatment**
  - Documentation
  - Communication
  - Education and Training**
  - Consultation
Technology in Geriatric Practice

• Telemedicine and Telepractice:
  – Telemedicine: the remote diagnosis and treatment of patients by means of telecommunications technology.
  – Telepractice: “Range of services provided through telecommunications, including clinical services for communication enhancement, and education and supervision.” (ASHA, 2005)

Telehealth & Telepractice

• Telehealth will make care more accessible to Boomers
  – Health technology will move into the home environment
    • Allows remote monitoring of patient’s condition while living in home environment
    • Will help keep patients out of the hospital
    • Provides communication links with caregivers

Telepractice Justification

The goals of using patient centered advanced technology for Speech Language Pathology clinical practice:
• Treating a broader patient population and more medically complex conditions
• Improving outcomes and quality of life
• Expanded therapy services will enable “clinical excellence”
• Improving quality assurance including proactive management of surveys, regulatory compliance, documentation and liability associated with prevalent conditions
Technology in Geriatric Practice
• Today’s discussion will focus on:
  – Assessment and/or treatment:
    • Dysphagia: an impairment in swallowing function
    • Cognitive – Communication Impairments
    • Communication Impairments

Technology: Dysphagia Management
• Assessment:
  – Modified Barium Swallow Studies (MBS)
  – Fiberoptic Endoscopic Evaluation of Swallowing (FEES)
Technology: Dysphagia Management

• Modified Barium Swallow study:
  – An x-ray study to evaluate the anatomy and function of the stages of swallowing:
    • Oral stage
    • Pharyngeal stage
    • Esophageal stage
  – Barium is mixed with food and liquids to swallow
  – Barium is followed as it goes from the mouth to the stomach
  – X-ray study is digitally recorded for review
  – Results can be shared via e-mail with referring physicians

http://www.youtube.com/watch?v=Ri8bBhw9msQ

Dysphagia Management: Assessment

• FEES: is an instrumental assessment of the pharyngeal stage of swallowing
  – 5 key components included in this assessment:
    • Assessment of anatomy related to swallowing
    • Assessment of movement within the hypopharynx and laryngopharynx
    • Assessment of secretion management
    • Direct assessment of swallowing function of foods and liquids
    • Response to therapeutic interventions and compensatory strategies on swallowing function

http://www.youtube.com/watch?v=No7RjIucc8I
Dysphagia Management: Treatment

• Iowa Oral Performance Instrument (IOPI):
  – Strength training device that provides:
    • Objective measures of lip and tongue strength
    • Allows the clinician to set exercise parameters
    • Measures improvement

• Madison Oral Strengthening Therapeutic Device (MOST):
  – Measures pressure by the tongue against the hard palate via a multi-sensor mouthpiece
  – Software interface indicates performance
    • Calculates therapy targets
    • Maintains a log of therapy sessions
    • Provides objective quantifies performance report
    • Can be used as part of a home exercise program:
      – Residents can send SLP data as part of a home exercise program with SLP able to modify exercise targets accordingly

• MOST
## Dysphagia Management: Treatment

- **Iphone/Ipad Applications:**
  - **Swallow Now and Swallow Prompt:**
    - Used for secretion management
    - Provides sound at a specific timed interval in which resident is instructed to swallow
    - Used to develop more frequent, automatic swallow pattern
  - **Small Talk Dysphagia:**
    - Provides a means for residents to communicate their swallowing needs
    - Contains phrases specific to eating, drinking, swallowing, strategies, etc.

## Dysphagia Management: Patient/Family Education

Videos and demonstration of swallowing exercises and techniques:
- Iswallow

Videos of normal and impaired swallow:
- Dysphagia
- Normal Swallow

## Technology: Cognitive-Communication Disorders

- **Cognitive-Communication Disorders - Computer-based system**
- **Dakim**
  - Clinically tested to improve memory
  - Designed for individuals >60 years old
  - Adjusts level of challenge based on overall performance
  - Addresses 6 Cognitive Domains:
    - Long Term Memory
    - Critical Thinking
    - Computation
    - Short Term Memory
    - Visuospatial Orientation
    - Language
Technology: Cognitive-Communication Disorders

• Cognitive-Communication Disorders - Computer-based system

• Luminosity
  – Acts as a "personal trainer" for the brain to exercise target processes that may decline with age:
    • Working memory
    • Speed of processing
    • Attention
  – Uses science of neuroplasticity
  – Research based approach to cognitive health and wellness

It’s Never 2 Late (IN2L)

IN2L

• Therapy/Engagement Tools
  – Virtual Bike
  – Flight Simulator
  – Driving Simulator
  – Touch Screen Puzzles
  – Speech Therapy Applications
  – Cognitive Recognition Tools
  – Memory Applications
  – Sequencing
  – Dementia Engagement
  – Painting/Art Therapy
  – Adaptive Keyboards and Track Ball Mouse
  – E-mail
Innovative Ways to Provide Treatment - IN2L

- Cognition and Memory Recall
- Cognitive Communication Deficits
- Receptive/Expressive Language Deficits
- Speech Intelligibility Impairments
- Fluency Disorders
- Voice Disorders
- Auditory Processing Deficit
- Safety Awareness Deficits
- Problem Solving Deficits

Technology: Cognitive Communication Disorders

- Ipad/Iphone/Tablet Apps:
  - Left versus Right
  - Fit Brains
  - Logic Games
  - Word To Word Association
  - Word Wall
  - Chain Thought

Technology: Cognitive-Communication Disorders

- Ipad/Iphone Apps:
  - BrainChallenge: Count 25
  - Imazing: Number Recall
  - Bills & Coins: Memory
  - Sketchy Memory: The Moron Test
Technology in Geriatric Practice

Apple iPad as a Therapy Tool

- Out of the box apps for the creatively thinking clinician
- Paid and free versions of apps through the Apple Store
  - Cognitive-linguistic functioning
  - Aphasia treatment
  - Motor speech treatment
  - Dysphagia treatment
  - Alternative and Augmentative Communication

Itouch/Ipad

Out of the box iPad Apps as therapy tools and iPad Tricks

| Apple Maps | Text to Talk |
| Safari     | Guided Gestures |
| Reminders  | Screen Shots   |
| Youtube    | Video          |
| Camera     | Switch Control |
| Calendar   | Head Gesture Control |
Several studies indicated that external assistive technology (e.g., portable voice organizer or mobile phone) is considered effective in patients with severe memory impairment as a result of neurodegenerative diseases such as Alzheimer’s disease.

*Adapted from ASHA website

Evidenced Based Practice
Dementia
Cognitive-Communication Treatment
Compensatory Treatments: Assistive Technology

The goal of increased participation in important life activities for people who have acquired severe disabilities is a positive intervention target for many individuals who would otherwise be written off in a medical model of management.

Case Report
- Left CVA with expressive aphasia, decreased vocal intensity and mild cognitive deficits.
- Interests include: Discussing research, the outdoors, reading & weather
- IPAD
  - Safari
  - Email
  - Weather
  - AAC apps
  - Reminders
  - Cognitive-Linguistic apps
We must remember that adults with acquired conditions do not have an agency to organize and deliver AAC services, as public school systems do. Therefore it is the responsibility of AAC teams and their colleagues to find ways to provide efficient, high quality AAC services.

(Beakelman, Yorkston & Garrett, 2007)
IPad APPS for AAC

• Proloquo2go
• Custom Boards
• My voice
• TalkTablet
• Simplified Touch

AAC

• AAC technology has advanced within the past twenty years creating many options for AAC users including High Tech AAC devices from companies:
  • Dynavox (Maestro, V, Vmax, EyeMax)
  • Prentke Romich Company (Vantage, Vantage Lite)
  • Saltillo Corporation (Nova Chat)
  • Zygo Industries, Inc. (Optimist, e-Talk)

Dynavox

• Maestro
  – Comprehensive Support
  – Training
  – Time-saving techniques that allow users to quickly compose and communicate a message in any context while avoiding unnecessary navigation.
    • Phrase Prediction - assigns collections of phrases to concepts, making them easily accessible
    • Slots - provide easy access to related words that can be used to complete a message
    • Quickfires - useful in a variety of situations as short conversation interjections
Dynavox

- **Maestro**
  - New technological capabilities include save and load text files to create longer messages in advance and save them as for later use. This includes loading other text files (letters from friends, medical documents, etc.) into the message window and speak them using the device.
  - Dashboard hotspot button allows quick access to the popup of the user’s choice, which can contain behaviors such as volume up/down, word morphology, edit commands, etc.

AAC in Health Care

Justification for using AAC

- May increase social interaction, Rehab outcomes/performance, and feelings of self-worth.
- Communication of vital information for medical staff and family members.
- Communication difficulty is the most common distressing symptom reported by mechanically ventilated patient.
- Easy to initiate and implement.
- Success is well documented.
- High ceiling of implementation*

AAC team

Where are you on the continuum?

- AAC finders
- AAC facilitators
- General practice SLPs
Tomorrow’s Tools Today

• Live internet webcasts - virtual classrooms
• Blended Learning Education
• Telerehab/Telepractice – video conferencing
• Communication Tools
  – E-mail
  – Cell Phones
  – Text Messaging

Web List

• [https://www.diigo.com/user/ccrema](https://www.diigo.com/user/ccrema)

Conclusion

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