Telepractice Delivery to Assess Adult Speech, Language, and Swallowing Disorders

A presentation to the National Academies of Sciences, Engineering, and Medicine, Workshop on: The Use of Telehealth for Disability Evaluations in Medicine and Allied Health (Re: Social Security Disability eligibility).

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Conflict of Interest Declaration

Relevant financial relationships:
Ellen Cohn receives speaking fees from conferences. She receives book royalties from Telerehabilitation (Springer UK) and Tele-AAC (Plural Press).

Relevant non-financial relationships:
Cohn is a member and past director of the American Telemedicine Association. She was the founder of the ASHA Special Interest Group # 18 on Telepractice. Cohn is a committee member of the MidAtlantic Teleheath Resource Center (MATRC) annual conference, and editor of the *International Journal of Telerehabilitation.*

1

1. Provide an overview of the SLP profession and scope of practice

2

2. Provide an overview of Telepractice

3

3. Present an overview of research on SLP assessment

Three Purposes

SPEECH-LANGUAGE PATHOLOGY

The Professional

A *speech-language pathologist* (SLP) is the professional who engages in professional practice in the areas of communication and swallowing across the life span.

- SLP-A: Assistant

US Professional Association:

- American-Speech-Language Hearing Association (ASHA)
- 188,143 members
- 785 hold dual certification: SLP and audiology

CCC-SLP (Certificate of Clinical Competence)

- MA or MS degree: core courses, supervised clinical practicum
- Passing score on Praxis Exam
- Clinical Fellowship Year
- Annual continuing education

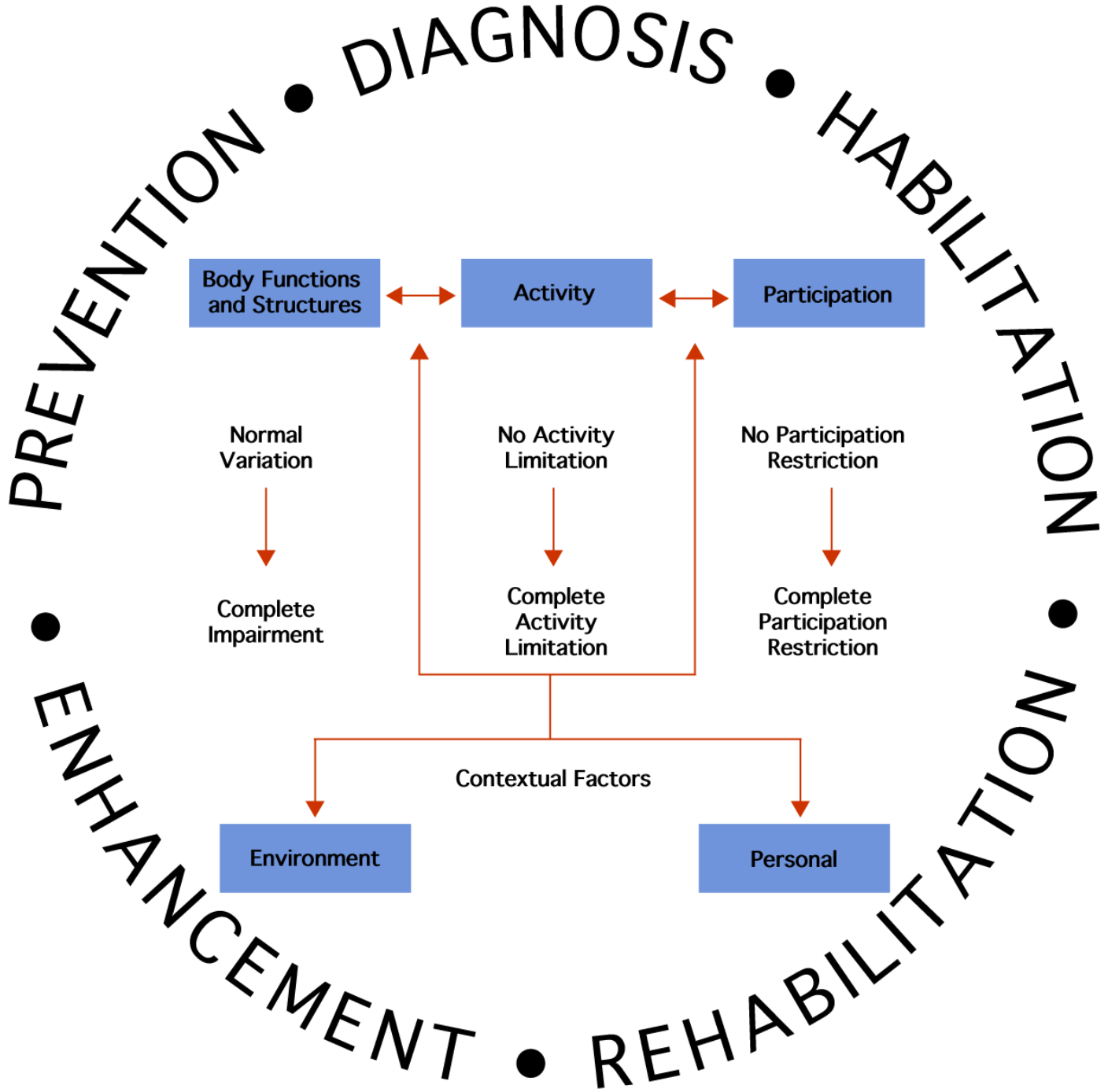
Scope of Practice

Service delivery areas include all aspects of communication and swallowing and related areas that impact communication and swallowing:

- Speech production, fluency, language, cognition, voice, resonance, feeding, swallowing, and hearing.
- The practice of speech-language pathology continually evolves.

SLPs play critical roles in:

- health literacy
- screening, diagnosis, and treatment of autism spectrum disorder, and
- use of the *International Classification of Functioning, Disability and Health* (ICF; World Health Organization [WHO], 2014) to develop functional goals and collaborative practice


PREVENTION • DIAGNOSIS • HABILITATION • REHABILITATION • ENHANCEMENT •
Body Functions and Structures
Activity
Participation
Normal Variation
No Activity Limitation
No Participation Restriction
Complete Impairment
Complete Activity Limitation
Complete Participation Restriction
Contextual Factors
Environment
Personal

Speech Production

- Motor planning and execution
- Articulation
- Phonological

Fluency

- Stuttering
- Cluttering

Language

- Prelinguistic communication
  - Joint attention, intentionality, communicative signaling
- Spoken language
  - Listening, processing
  - Speaking
- Literacy
  - Reading, writing, spelling
- Non-verbal communication
  - Gestures, signs, body language

Cognition

- Attention
- Memory
- Problem solving
- Executive functioning

Voice & Resonance

Voice

- Phonation quality
- Pitch
- Loudness
- Alaryngeal voice

Resonance

- Hypernasality
- Hyponasality
- Cul-de-sac resonance

Feeding and Swallowing

- Oral phase
- Pharyngeal phase
- Esophageal phase
- Atypical eating (e.g., food selectivity/refusal, negative physiologic response)

Auditory rehabilitation/habilitation

- Speech, language, communication, and listening skills impacted by hearing loss, deafness
- Auditory processing

NOMENCLATURE: WHAT WE CALL “TELE” MATTERS

What Modes are (Variously) Accepted?

Synchronous

- Real-time videoconferencing
- Phone (debated)

Asynchronous

- E-mail, text messages, fax, data logs, are variously accepted
- “Store and Forward” (x-rays, test results, etc.)

Location of Client (& E-helper) /Clinician

- **In-Person**

  All are “in the same room”

- **Patient Location**
  - Home, school, community center, clinics, ship, etc.
- **Hybrid**
  - Combination of telehealth and in-person services
  - May differ from session to session
  - May use both in the same session (e.g., in-room plus expert on video)
  - Research is needed

Tele-Terminology is Inconsistent

- Telehealth: American Occupational Association [AOTA], American Physical Therapy Association [APTA], sometimes American Telemedicine Association [ATA]
- Telerehabilitation: Physical Therapy, Occupational Therapy, Speech and Hearing, sometimes ATA
- Teletherapy: Special Education
- Telepractice: American Speech-Language Hearing Association
- Telemedicine: American Telemedicine Association

US Tele-language

TELEMEDICINE: AMERICAN TELEMEDICINE ASSOCIATION

- Home monitoring and
- Human factors
- Pediatric telehealth
- Tele-dentistry
- Tele-dermatology
- Tele-genetics
- Tele-ICU and Acute Care
- Tele-mental health
- Tele-ophthalmology (Ocular telehealth)
- Tele-primary care
- Tele-radiology
- **Telerehabilitation**

ASHA Chose Telepractice. Why?

- The profession works in medical AND non-medical sites
- School-based practice is diverse
    - Includes educational, rehabilitation, medical, and health conditions
- Telepractice includes:
    - Tele-speech
    - Tele-audiology
    - Tele-AAC
        - Emerging –Assistive and Augmentative Communication
        - Sometimes includes Vendors
- Telepractice excludes: Telesupervision, Distance education

Why is Inconsistent Terminology Problematic?

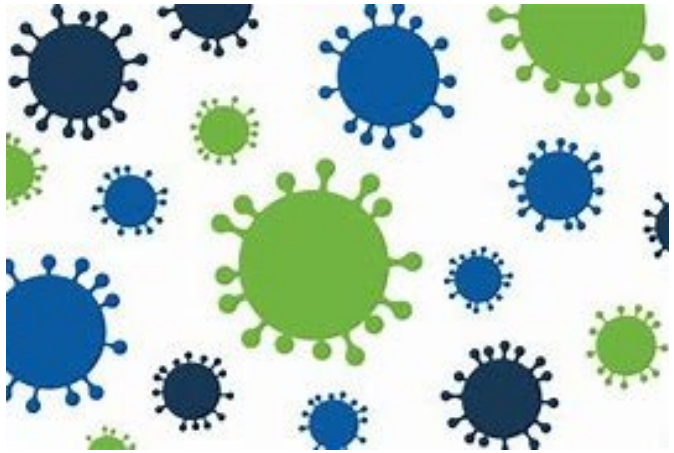
- It perpetuates professional silos
- It is awkward when advocating for increased reimbursement
  - Legislative language must be broadly inclusive
- When an article, or grant proposal is authored by different professionals: whose terminology prevails?

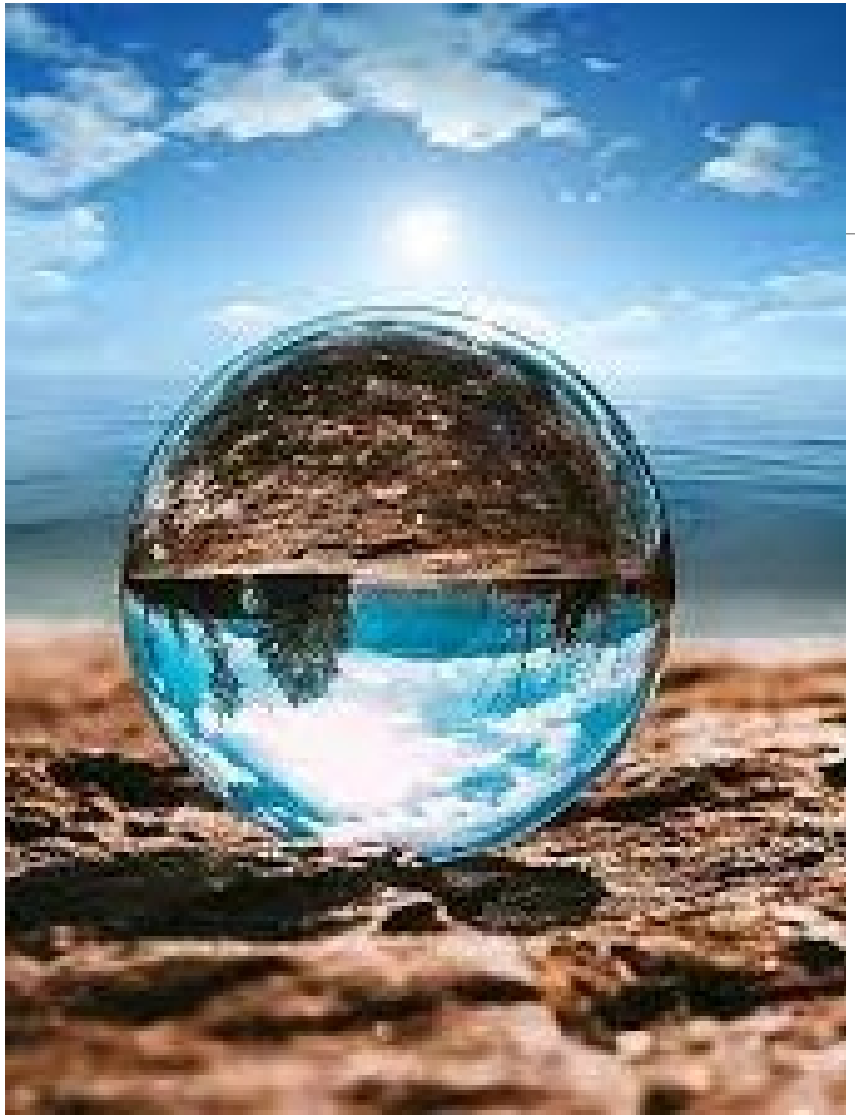
ENVIRONMENTAL CHALLENGES FOR SLP TELEPRACTICE

The Telepractice Environment is Evolving

- Powerful external influencers
  - Insurance companies and healthcare systems
  - Federal Government: US Congress, CMS, FCC, FDA and other regulatory agencies
  - $$$$ in the telemedicine and industry sector
- Powerful internal influencer:
  - American Speech-Language Hearing Association (ASHA)
    - **ASHA Scope of Practice**
    - **ASHA Code of Ethics**
    - **ASHA Special Interest Group (SIG 18) on Telepractice established October 2010.**
    - ASHA Practice Portal provides information about telepractice as a service delivery model

The Novel Coronavirus:
A Tipping Point for Telepractice





Expected Future Influencers

- Vendors (Tele-AAC Equipment)
- Automobile manufacturers
- Wearables (Nike)
- Apple
- Smart rooms/homes
- Researchers
- Consumers

State Licensure is Influential (for non-military practice)

- State Legislatures and State Professional Licensure Boards
  - Dictate scope-of-practice within a state
  - *"You know one state; you know one state"*
- The Audiology & Speech-Language Pathology Interstate Compact (ASLP-IC)
  - An ASLP-IC Commission was formed
  - 15 states joined as of 01/2022
  - **Privileges to practice are expected to begin issuing in 2023.**
    - https://www.asha.org/advocacy/state/audiology-and-speech-language-pathology-interstate-compact/
    - https://www.asha.org/news/2022/aslp-ic-progresses-to-the-next-phase/

Technology Evolves Faster Than…

- Policy, Regulation, and Ethics
- Training
- Professional Trust
- Consumer Trust and Action
- Resources and Payors

RESEARCH

Evidence for Telepractice Is Growing

- Indicates equivalent and sometimes superior clinical results
  - Has not been ruled out for any population
- Saves travel time and money for consumers
- ASHA Evidence Maps post research on the use of telepractice. https://www.asha.org/About/Telepractice-Resources-During-COVID-19/

Research Weaknesses

Non RCT studies proliferate:

- Lack of control groups and randomization.

Some ignore IRB and HIPAA requirements

Populations studied: some have heterogeneity of disorders

Many mix telepractice technologies and environments

Context Specific Research Environments (i.e., Location of client and/or clinician)

Anywhere a mobile device can be used.

In-homes

Private Practices

Early Intervention

Schools

Hospitals (acute and rehabilitation)

Hospice settings

Community Clinics

Universities

Rehabilitation Centers

Military sites

Correctional facilities

Kiosks

Pharmacies

“Big box” stores

Transportation (planes, ships, submarines, in orbit, celebrity tour buses, etc.)

And more…

Reporting Bias for Negative Results in Digital Health?

Al-Durra et al, J. *Med. Internet Res*., 2018, Dec 18:20 (12): e-11924, doi: 10.2196/11924. Nonpublication rates and characteristics of registered randomized trials in digital health: Cross sectional analysis

Five years after their completion date: 27% of registered clinical trials results are unpublished, lower than nonpublication rates in other fields.

There are substantial differences in nonpublication rates between trials funded by industry and non-industry sponsored randomized trials.

Over-Arching Research Needs

- More research funding
- Sustainable faculty positions & interdisciplinary research institutes
- Randomized clinical trials (RCTs) & Multi-center studies
- Consumer-driven research
- Evidence Based Translational Research →Leading to Technical Standards, and Standards and Guidelines

Unanswered Research Questions

When is a hybrid approach required?

Patient Selection:

- How to determine client/patient candidacy for telehealth?
- When is telemedicine unwise/even dangerous?

Is clinician compassion as effectively perceived via telehealth?

More Future Research Opportunities…

Access and Equity

Artificial Intelligence (AI)

Economic Impacts on the Healthcare System and the SLP Workforce

Models of Inter-disciplinary Team Practice

Mobile Apps

Multi-cultural factors

Privacy and Security

Tele -ethics

Professional Development Requirements to Achieve Minimal Standards of Practice

Transitional Care

Virtual Environments, Simulations, and Gaming

NEEDED: NOVEL PARADIGMS

Selected Research Findings

[DIRECT QUOTES FOLLOW FROM ASHA EVIDENCE BASED MAPS]

Adult SLP Services

Telepractice for Adult Speech-Language Pathology Services: A Systematic Review

Weidner, K., & Lowman, J. (2020). Perspectives of the ASHA Special Interest Groups, Epub ahead of print retrieved February 5, 2020, from https://doi.org/10.1044/2019_PERSP-19-00146.

A systematic review of published, peer-reviewed studies investigating the SLP services delivered via telepractice for adult populations (e.g., aphasia, dysphagia, traumatic brain injury).

- Three studies comparing the diagnostic accuracy of dysphagia assessment (e.g., videofluroscopy or clinical swallow evaluations) via telepractice reported high agreement between in-person and remote diagnostic findings. While patients with severe dysphagia conditions were more difficult to assess, similar diagnostic challenges were also observed in the in-person setting.
- Two studies investigating the diagnostic accuracy of aphasia screening or assessment via telepractice reported test reliability and comparable intrarater and interrater reliability to in-person testing.

Autism Spectrum

A Systematic Review of Remote Telehealth Assessments for Early Signs of Autism Spectrum Disorder: Video and Mobile Applications

Dahiya, A. V., McDonnell, C., et al. (2020). Practice Innovations, 5(2), 150-164

This is a systematic review of research examining video-based and application-based assessments used to diagnose autism spectrum disorders in infants and toddlers.

Findings related to video-based and application-based assessment of infant and toddlers with suspected autism spectrum disorder was limited to seven studies.

- Three studies examined video conferencing or video analysis while four studies analyzed mobile or web applications.

Overall, the literature showed promising results with some feasible methods. Further research with larger samples and more rigorous design is warranted.

Autism

Telehealth and Autism Prior to and in the Age of COVID-19: A Systematic and Critical Review of the Last Decade (Systematic Review)

Ellison, K. S., Guidry, J., et al. (2021). Clinical Child and Family Psychology Review, 24(3), 599-630.

For children and adolescents with autism, a limited number of studies investigating assessments via telehealth found that diagnostic evaluations and assessments for other purposes are feasible.

- Four studies examining the social validity of telehealth assessments found that the use of technology and equipment was acceptable and that any technical difficulties were manageable.

Additional research on the efficacy of utilizing standardized autism assessment measures via telehealth is needed.

Alzheimer’s Disease

Tele-Neuropsychological Assessment of Alzheimer's Disease

Carotenuto, A., Traini, E., et al. (2021). Journal of Personalized Medicine, 11(8), 688.

This is a systematic review of English-language research articles examining the reliability of neuropsychological tests administered via telemedicine to individuals with suspected dementia and/or cognitive impairment.

Overall, telemedicine was shown to be reliable and generally accurate for the screening of mild cognitive impairment and the assessment of Alzheimer's disease in mild to moderate stages.

The Mini Mental State Examination can be administered via telemedicine with minor adaptation in the scoring system. Cognitive assessment by videoconference compared to face-to-face evaluation showed comparable scores.

Further comprehensive research is warranted to ensure that all eligible studies are identified and analyzed.

Dementia

Telemedicine and the Rural Dementia Population: A Systematic Review

Sekhon, H., Sekhon, K., et al. (2021). Maturitas, 143, 105-114.

This is a systematic review of studies investigating the accessibility and acceptability of telepractice to assess cognition in elderly individuals with dementia living in rural areas.

For elderly adults with dementia living in rural areas, studies investigating the use of cognitive tests conducted via telepractice reported mixed feasibility and reliability results. The studies were heterogeneous in the variety of assessment tools investigated, the different populations included, and the variable controls used and study designs implemented. The author's note that remote cognitive assessment does improve accessibility to services for individuals living in rural areas. Additional research is needed.

Dementia and Mild Cognitive Impairment (MCI)

Accuracy of Telephone-Based Cognitive Screening Tests: Systematic Review and Meta-Analysis

Elliott, E., Green, C., et al. (2020). Current Alzheimer Research, Epub ahead of print retrieved July 10, 2020 from https://doi.org/10.2174/1567205017999200626201121.

For screening individuals with suspected dementia via telephone, twenty-six studies investigated twelve tests.

The Telephone Interview for Cognitive Status (TICS) and TICS-m (modified) demonstrated the best screening accuracy for dementia via telephone. Both tools were found to have high sensitivity (TICS = 0.92; TICS-modified = 0.91) and lower specificity (TICS = 0.66; TICS-modified - 0.91) suggesting "that there is no substantial decrement in the accuracy when using the telephone" (p. 467). Additional research comparing telephone screening to in-person assessment against the same gold standard is needed.

Neuropsychological Testing

Neuropsychological Test Administration by Videoconference: A Systematic Review and Meta-Analysis

Brearly, T. W., Shura, R. D., et al. (2017). Neuropsychology Review, 27(2), 174-186.

For assessing neurocognition in adults the adults, videoconference administration demonstrated no significant change (g = -0.03; SE = 0.03; 95% CI-0.08-0.02, p = 0.253) as compared to in-person administration. "This meta-analytic review provides support for the use of videoconferencing technology in the remote administration of neuropsychological tests, particularly those that rely on verbal responses from participants [e.g., Boston Naming Test, Mini-Mental State Exam]" (p. 184).

Swallowing/Dysphonia

Guidelines of Clinical Practice for the Management of Swallowing Disorders and Recent Dysphonia in the Context of the COVID-19 Pandemic

Mattei, A., Amy de la Bretèque, B., et al. (2020). European Annals of Otorhinolaryngology, Head and Neck Diseases, Epub ahead of print retrieved April 29, 2020 from https://doi.org/10.1016/j.anorl.2020.04.011.

"In situations where urgent management of swallowing disorders is compulsory, as in some postoperative cases or in some patients with neurodegenerative diseases, tele-rehabilitation is preferable whenever it is technically possible and allowed by the current regulations" (p. 2).

Laryngologists and speech pathologists may need to perform nasoendoscopies and laryngoscopies for recent dysphonia cases that cannot be postponed. If feasible, a teleconsultation is preferred.

Swallowing/Neurogenic Disease

The Neurogenic Dysphagia Management via Telemedicine: A Systematic Review

*Reverberi, C., Gottardo, G., et al. (2021). European Journal of Physical and Rehabilitation Medicine, Advance online publication. https://doi.org/10.23736/s1973-9087.21.06921-5.***Description**

This is a systematic review of published studies using various research designs investigating the management of neurogenic dysphagia via telepractice, compared to face-to-face treatment, in people with neurogenic dysphagia.

"This systematic review highlighted high levels of agreement between the face-to-face evaluation and the swallowing assessment via telerehabilitation, which seems to be not influenced by the severity of dysphagia, the location of stroke and severity of the disease" (p. 16). Although findings suggested that telerehabilitation could be beneficial for people with neurologic swallowing problems, literature involving telerehabilitation in the field of neurogenic dysphagia was limited.

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Voice Disorders

A Systematic Review of the Use of Telehealth in Speech, Language and Hearing Sciences

Molini-Avejonas, D. R., Rondon-Melo, S., et al. (2015).
Journal of Telemedicine and Telecare, 21(7), 367-376.

Nine studies examined use of telehealth in voice disorders. Most addressed assessment and screening of voice, and "results showed that remote voice assessment was considered reliable and viable" (p. 19). One study compared face-to-face intervention with intervention via real-time remote videoconferencing and found no significant differences in outcomes (perception of voice quality, acoustic changes, patient satisfaction, laryngeal changes). Access to services and cost-effectiveness were mentioned as benefits of telehealth. Barriers included internet/computer access, internet speed, and individual skills in using telehealth.

Pediatric SLP Disorders

The Efficacy of Telehealth-Delivered Speech and Language Intervention for Primary School-Age Children: A Systematic Review

Wales, D., Skinner, L., et al. (2017).
International Journal of Telerehabilitation, 9(1), 55-70.

This is a systematic review of intervention studies investigating the effects of telehealth-delivered speech and language intervention in elementary students with speech and language disorders.

"The conclusions found … on the effectiveness of telehealth-delivered intervention are dependent on the selected outcome measure. Outcomes for telehealth were more consistently positive when standardised assessments, such as the [*Goldman Fristoe Test of Articulation - Second Edition*] GFTA-2, were used for the pre- and post-intervention testing"

Conclusions:
There is Growing Evidence for Telepractice

- Overall comparable or better outcomes:
  - Equivalence and efficacy
  - Cost savings & travel time
  - Consumer and provider satisfaction
  - Can increase access to services
- Not all clients are candidates
- More research is needed

Thank you!