



# Telehealth: Strategies and Best Practices for Rehabilitation

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*These contents do not  
represent the views of the  
Department of Veterans Affairs  
or the United States  
Government.*

*Disclosure: Presenter is a  
VA Employee*



VETERANS HEALTH ADMINISTRATION

# Objectives

1. Utilize virtual options to stay connected with patients and their families
1. Develop a strategy for telehealth services: Who, What, When, Where, and Why then the Technology
1. Understand basic strategies for an effective telehealth visit
1. Review telehealth options across the healthcare continuum (from inpatient to outpatient)
1. Identify and implement best practices when establishing a telehealth services

***(Special Note: telehealth, telepractice, telerehabilitation, telespeech)***

# Health Care Transition





# Historically...

VA Speech Pathologists began utilizing telehealth technology for communication disorders in the early 1980's



# VA Speech Pathology Telehealth

- Tel-C – VA Cooperative Study (Vaughn and colleagues/Birmingham VAMC, Multicenter Research, 1980's )
- Aphasia Assessment – Managing Patients Out of Our Site in Remote Settings (Wertz, Dronkers, Bernstein-Ellis, Sterling, Shenaut, Knight, Deal/Martinez & Columbia VAs), 1991 & 1992
- Aphasia Treatment and Microcomputers (Katz/Los Angeles OPC and Phoenix VA), 1980's – present
- Voice rehabilitation (Mashima, Birkmire-Peters, Holtel, and Sims/Tripler Army Medical Center), 1999
- Telehealth for Voice Treatment of Parkinson's Disease (Tindall/Kentucky, 2000 – present) Auditory Comprehension Testing with touch screen computer technology (McNeil/Musson, Pittsburgh and Gainesville VA)
- PIRATE, Intensive Aphasia Treatment (Doyle and colleagues, Pittsburgh, 2013 – present)

# Historically

Tindall, LR, Hueber, RA, Stemple, JC, and Kleinert, HL, Videophone-Delivered Voice Therapy a Comparative Analysis of Outcomes to Traditional Delivery for Adults with Parkinson's Disease, Telemedicine and e-Health, December 2008, p. 1070- 1977.

	<b>Average</b>	<b>Range</b>	<b>Average cost of 16 sessions</b>
Round trip mileage	93 miles	.5 to 200 miles	1488 miles
Time off from work	5.8 hours	2.5 to 10 hours	92.8 hours
Time involved in a speech therapy visit	3 hours	1.5 to 5 hours	48 hours
Dollar amount per visit	\$94.00	0 to \$400.00	\$1504.00
Other costs per visit	\$20.00	\$15.00 to \$35.00	\$ 320.00



# Benefits of Home Telehealth

1. High patient and provider satisfaction: Mean satisfaction for the patient and provider was 4.26 – 4.78 out of possible 5 points
2. Since COVID - 19 – 90% satisfied with telehealth

# 10 Principles of Rehabilitation

*Kleim, JA, Jones, TA. (2008). Principles of experience-dependent neural plasticity: Implications for rehabilitation after brain damage. Journal of Speech, Language, and Hearing Research, 51, S225-S239.*

1. Use it or lose it
2. Use it and improve it
3. Specificity
4. Repetition matters
5. Intensity matters
6. Time matters
7. Salience matters
8. Age matters
9. Transference
10. Interference



# Connected Care

# Scope of VA Telehealth Services

- 1. Clinical Video Telehealth (CVT)** – Real-time video consultation that covers over 45 clinical specialties including: Tele-Intensive Care, TeleMental Health, TeleCardiology, TeleNeurology, TeleSurgery, Women’s Telehealth, Tele-Primary Care, TeleSCI care, TeleAmputation Care, TeleAudiology, TeleSpeech, Remote Nursing Home Consultation, TelePathology, etc.
- 2. Home Telehealth (HT)** – Care and case management of chronic conditions and provision of non-institutional care support to patients. Uses in-home and mobile technologies to manage diabetes, chronic heart failure, hypertension, obesity, traumatic brain injury, depression, etc.
- 1. VA Video Connect (VVC)**- Anywhere: The patient can be anywhere geographically from Hawaii to Maine to Alaska. Any place: the patient can be at home, at work, at school, traveling, etc. Anytime: After hours access. Connection through web browser, 4G connections, WIFI, LAN
- 1. Store and Forward Telehealth (SFT)** – TeleRetinal Imaging, TeleDermatology, TeleWound Care, TeleSpirometry, Tele-Sleep Studies



“The right care,  
at the right place  
at the right time”



**Who, What, When, Where and Why**

**Then determine How**

# Same High Quality Care

- Traditional office visits
- Evidence-based practice

American Speech-Language Hearing Association Telepractice Evidence-Based Maps:

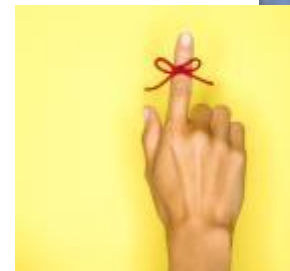
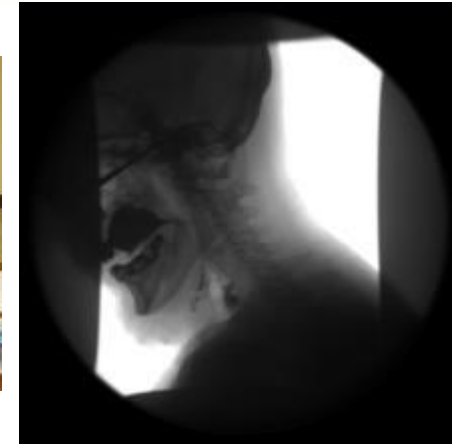
<https://www.asha.org/EvidenceMapLanding.aspx?id=8589944872&recentarticles=false&year=undefined&tab=all>

- Coordinated Services
- Continuous care



# Communication and Swallowing Disorders

(Aphasia, Dysarthria, Apraxia, Cognitive, Dysphagia, Dysphonia, Aphonia , Alaryngeal ...)





<b>Diagnosis</b>	<b>Evaluation</b>	<b>Treatment</b>	<b>Education Counseling</b>	<b>Assistant In the room</b>
Aphasia	Yes	Yes	Yes	Possibly
Voice	Yes, Screening Yes, Clinical Maybe, endoscopy No, stroboscopy	Yes	Yes	Not necessary
Cognitive	Yes	Yes	Yes	Not always Yes, dementia
Dysarthria	Yes	Yes	Yes	Oral Motor may need assistance  AAC exam may need some assistance
Dysphagia	Yes, Screening Yes, Clinical No, endoscopy No, fluoroscopy	Yes	Yes	Possibly Oral Motor Feeding assistance
Head & Neck Cancer Organ Preservation	Yes, Interview	Yes, pre-treatment Yes, during treatment Yes, post-treatment	Yes, pre-treatment Yes, during treatment Yes, post-treatment	Not necessary

# Oral Motor Exam



# When to Consider Telehealth

## Transportation Issues

- Distance from clinic/safety concerns
- Difficulties with driving (either veteran/caregiver)
- Cost to get to clinic
- Time

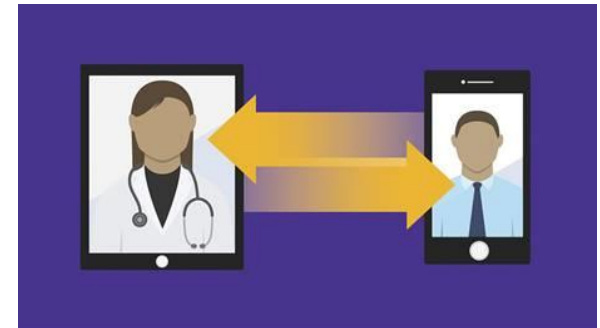
Physical toll on veteran or caregiver

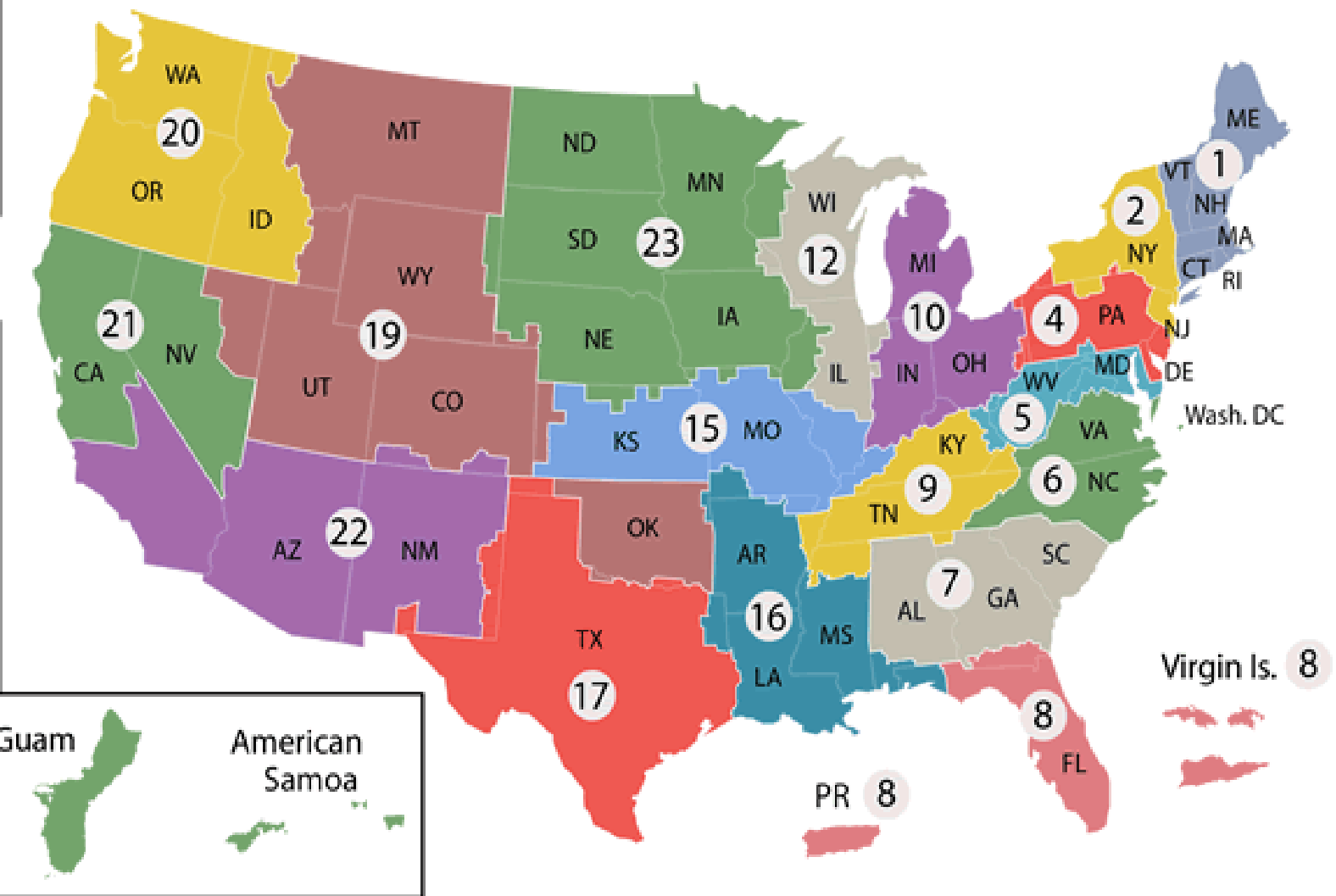
Fatigue

Frequent no-shows for clinic appointments

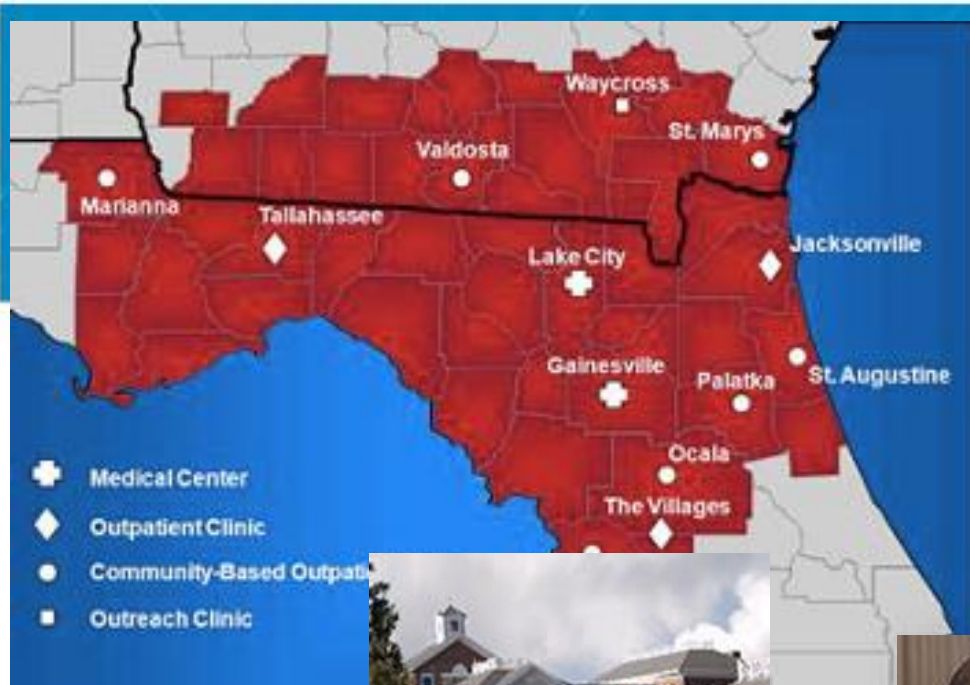
Inclement weather

Veterans who live in rural areas, or out of state









# Lessons Learned

(Setting the stage for a successful telehealth appointment)



# “Preflight Checklist”

Be prepared for anything that could go wrong and have a strategy to work around.

## **Safety**

- Know where your patient is (current location, address)
- 911 contact where your patient is located
- Emergency contact information readily available, “Suicide Hotline”
- Phone number for backup contact if telehealth fails

## **Clinician**

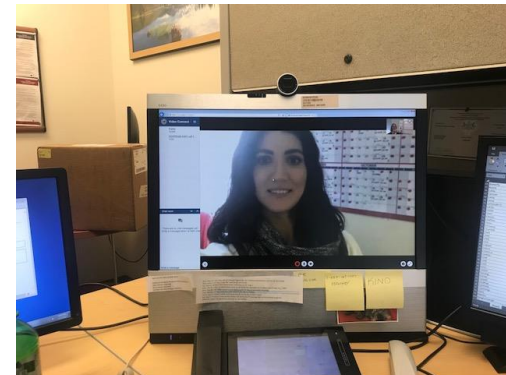
- Is your equipment working (mute and unmute microphone, volume check, camera control)
- Do you need any additional equipment (document reader, screen sharing)
- Check your view (eye contact, head, torso, and hands)
- Environment (lighting, background, ambient noise)
- Back up plan in the event video quality is poor or disconnected

## **Materials**

- What testing/treatment materials do you need? Are they telehealth friendly?
- Does your equipment work well with your materials?
- Do you need to Email, fax, or snail mail materials ahead of time?

## **Patient Preparation**

- “Test call” to review equipment, connection, environment, practice camera and volume controls
- Call the patient ahead of time if that might be helpful to assure ready and all materials available
- Email, fax, or snail mail description of steps to connect
- Check to make sure contact information is correct (see safety)
- Establish the best view (environment, view, etc.)





# Document....

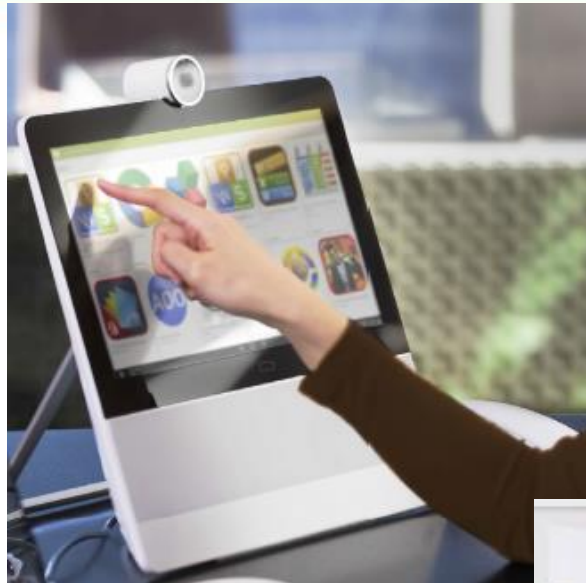
At the start of the session, the following information was verified:

- Veteran is in a safe location
- Veteran wishes to be seen via telehealth

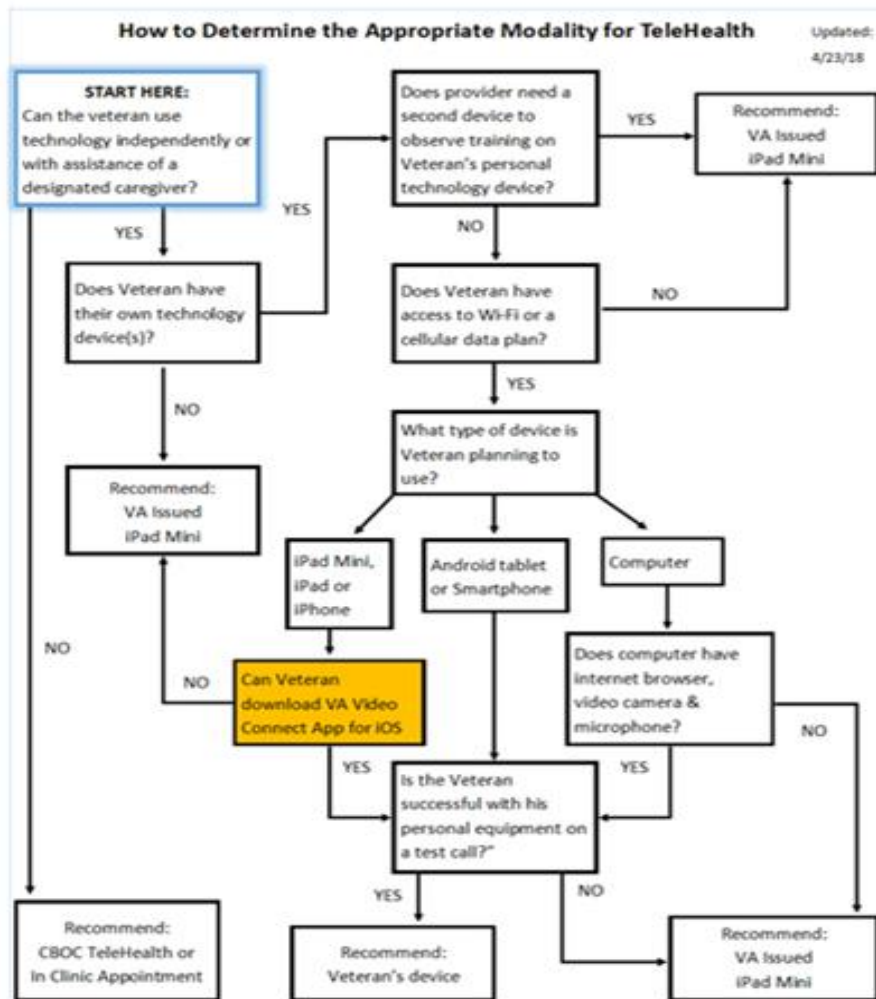
The following information was obtained:

- Emergency contact number: \_\_\_\_\_
- Phone number for Veteran contact: \_\_\_\_\_
- Veteran's current address: \_\_\_\_\_

# Technology

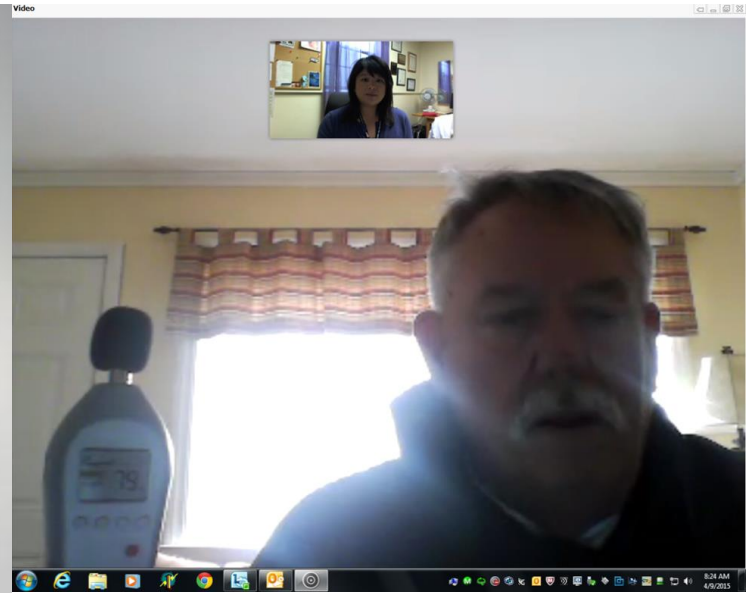


# How to Determine the Appropriate Modality for Telehealth



# Overcoming Challenges

(Hearing, Vision, Reading, Writing, Gesturing, and Apps)



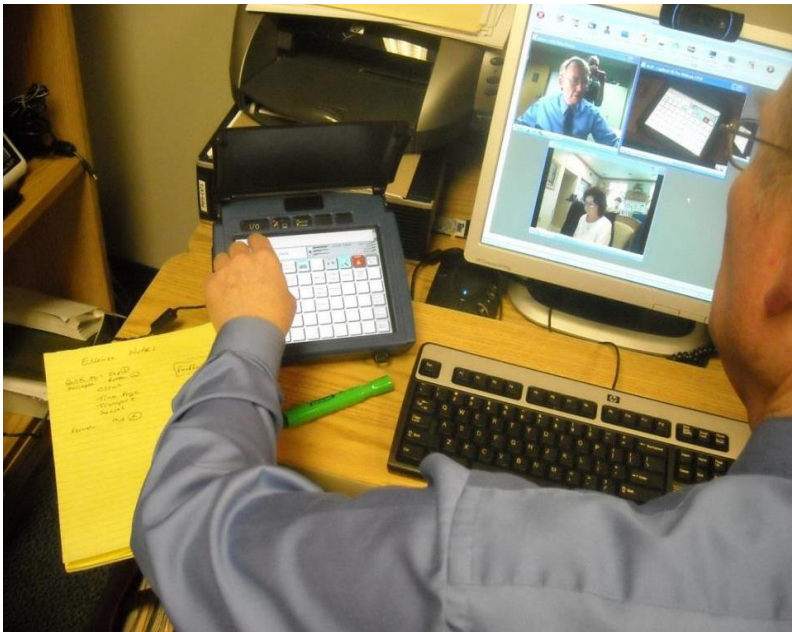
# Peripheral Equipment

(Provider or Patient Site)

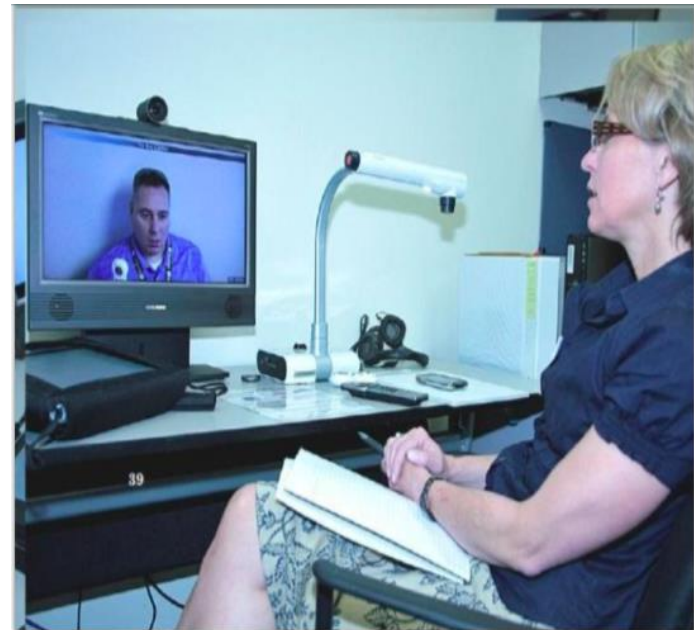


# Strategies to Demonstrate Functions of an Assistive Technology Device During a Telehealth Visit

Screen sharing:



Elmo document reader:





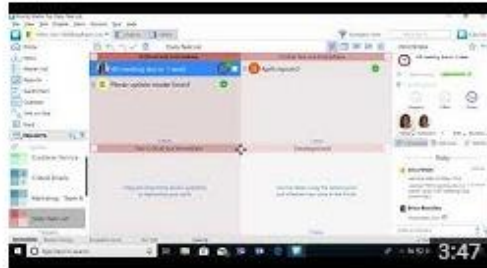
## iStudiez Pro for iPad - Getting started

David Allen

7 years ago • 1,097 views

How to get started with iStudiez Pro for iPad. Imagine that you have just started school for your autumn term and you need to set ...

Please click on the YouTube Like Button 5:26



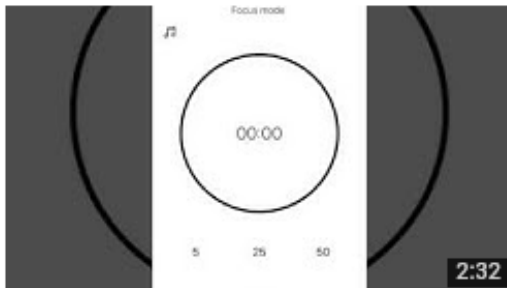
## Everything you need to know about Priority Matrix in 3 minutes

Priority Matrix

10 months ago • 3,081 views

Priority Matrix: Simple and effective task management software for busy people

3:47



## Tutorial for MinimaList app - All

Minimal Life

2 years ago • 11,760 views

How-to-use for MinimaList to-do app.

2:32



## Daily Notes App Review

Keep Productive

4 years ago • 8,319 views

Daily Notes is a new application designed to allow you to store Notes, Tasks and Calendar Events through their iOS Application.

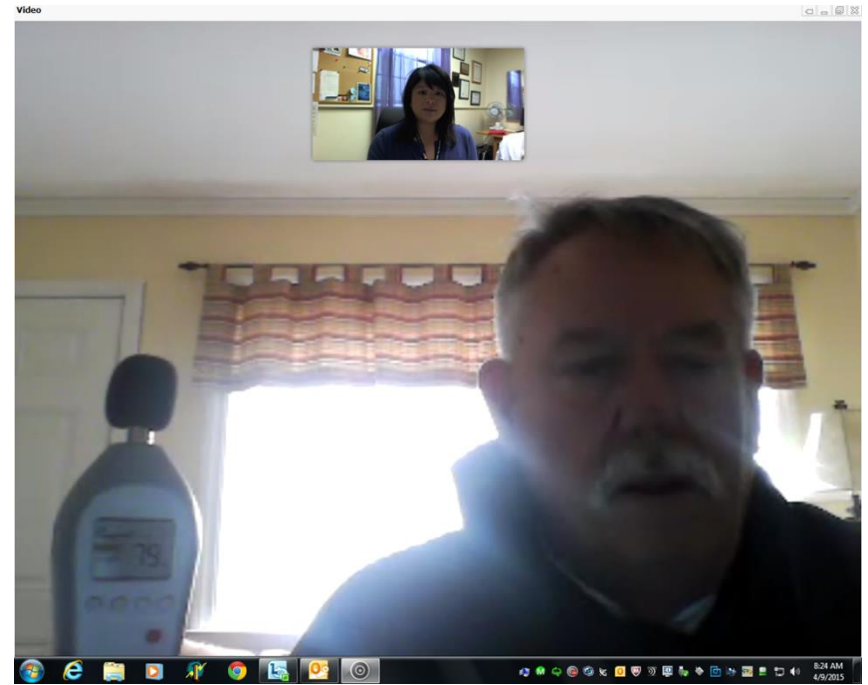
DAILY NOTES APP

FRANCESCO FALESIO

4:59



# Patient Equipment



VETERAN

.TION



# Choosing a Video Conference Platform

Look for these basic features when choosing a platform:

- **Webcam sharing.** This allows you to see your clients or students, and they can see you. Webcam sharing makes a session feel like you're practically right there in the same room with each other.
- **Screen sharing.** This lets you share your screen or digital materials with clients, so the client can see materials right there in front of them.
- **Interactive features.** Most video conferencing platforms include options for onscreen drawing and sharing control of the keyboard and mouse with the student, allowing the student to interact directly with the activities you present on the screen.

# HIPAA Guidelines

- Transmission should be encrypted to protect client privacy
- Relevant laws, state laws may apply
- Just like in your in-person practice, you'll need to maintain client privacy.
- When sending emails about your client, avoid using the client's full name. Instead, use the client's or student's initials to maintain privacy.
- When you send documents or show documents on your screen during sessions, make sure any private information is removed or blacked out, or passwords are used to secure the information.

# Considerations

*(Note: This not an endorsement of any platform and there may changes.)*

- HIPPA compliant: Skype for business, Up Dox, Vsee, Zoom for Healthcare, Doxy.me, Google G suite hangouts meeting
- Not recommended, Facebook Live, Twitch, Tic Toc
- Potential Risks: Apple FaceTime, FaceBook Messenger, Google Hangout, Skype

# Telehealth Partners

(Nurse, OT, PT, Assistant, Spouse, Family, Vendors)



# Questionnaires



## PTSD Checklist – Military Version (PCL-M)

Name: \_\_\_\_\_ Unit: \_\_\_\_\_  
 Best contact number and/or email: \_\_\_\_\_  
 Deployed location: \_\_\_\_\_

Instructions: Below is a list of problems and complaints that veterans sometimes have in response to a stressful military experience. Please read each one carefully, put an "X" in the box.

1.	Repeated, disturbing memory of a stressful military experience?
2.	Repeated, disturbing dreams of a stressful military experience?
3.	Suddenly acting or feeling as if a stressful military experience were happening again?
4.	Feeling very upset when reminded of a stressful military experience?
5.	Having physical reactions (e.g., trouble breathing, or sweating) when reminded of a stressful military experience?
6.	Avoiding thinking about or talking about a stressful military experience or avoiding people or places associated with it?
7.	Avoiding activities or talking about a stressful military experience or avoiding having fun?
8.	Trouble remembering important parts of a stressful military experience?
9.	Loss of interest in things that you used to care about?
10.	Feeling distant or cut off from others?
11.	Feeling emotionally numb or having trouble loving those close to you?
12.	Feeling as if your future will be unhappy?
13.	Trouble falling or staying asleep?
14.	Feeling irritable or having angry outbursts?
15.	Having difficulty concentrating?
16.	Being "super alert" or watchful?
17.	Feeling jittery or easily startled?

Has anyone indicated \_\_\_\_\_

## PATIENT HEALTH QUESTIONNAIRE (PHQ-9)

NAME: \_\_\_\_\_ DATE: \_\_\_\_\_

Over the last 2 weeks, how often have you been bothered by any of the following problems?  
 (Circle the number to indicate your answer)

	Not at all	Several Days	More than half the days	Nearly every day
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed or hopeless	0	1	2	3
3. Trouble falling or staying asleep, or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself, or that you are a failure or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people have noticed. Or the opposite—being so restless that you have been moving around a lot more than usual	0	1	2	3
9. Thoughts that you would be better off dead or hurting yourself in some way	0	1	2	3

## Symptoms

Symptoms	None	Mild	Moderate	Severe	Very Severe
Feeling Dizzy	0	1	2	3	4
Loss of balance	0	1	2	3	4
Poor coordination, clumsy	0	1	2	3	4
Headaches	0	1	2	3	4
Nausea	0	1	2	3	4

(Healthcare professional: For information only)

10. If you circled off any problems, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?

- Not difficult at all \_\_\_\_\_
- Somewhat difficult \_\_\_\_\_
- Very difficult \_\_\_\_\_
- Extremely difficult \_\_\_\_\_

# Pain Module Checklist



# Telehealth: Inpatient Care

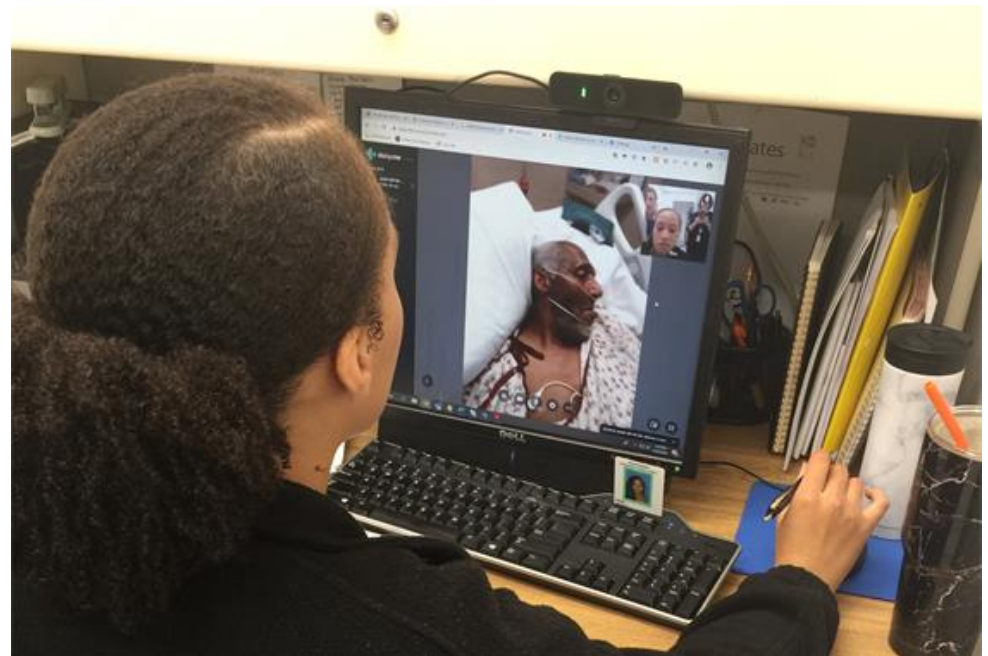
(Social Distancing)

## **Medical center:**

- Intensive Care Units
- Nursing Home, Skilled Nursing Facility, Community Living Centers
- COVID Units

## **Community:**

- Domiciliary
- State Veterans Homes
- Assistive Listening Facilities
- Medical Foster Homes



# Solutions for Inpatient Units: Security, Privacy and Safety

## Minneapolis VAMC



**Method 1:**  
VA Video Connect or  
Telehealth Equipment

**Method 2:**  
iPad Video Monitor &  
Assessment (iVMA)  
Program



# Cleaning Procedures

## Example:

- (1) Prior to touching the device or accessory, staff should perform hand hygiene and don gloves.
- (2) The iPad should be pre-cleaned and disinfected with a 70% isopropyl alcohol wipe or Clorox Disinfecting Wipe by gently wiping the hard, nonporous surfaces of the iPad (e.g., display or exterior surfaces) or associated peripheral accessory. Then disinfect the iPad or associated peripheral accessory by allowing the product to remain on the surface and air dry (according to the product's instructions for use). Avoid getting moisture in any opening (e.g., charging port).
- (3) Properly dispose of the wipes and move the iPad or associated peripheral accessory to a designated Clean area (be sure once iPad or associated peripheral accessory is cleaned that it does not come in contact with iPads or peripheral accessories that have not yet been decontaminated).
- (4) Remove gloves and dispose of them. Wash hands thoroughly (for at least 20 seconds) with soap and warm water.

Note: While cleaning devices, do not touch your mouth, nose, or eyes.

COVID+ utilize clear plastic (bag or covering)

# Home Interdisciplinary Telerehabilitation Team (HITT)

Des Moines VAMC

- Interdisciplinary Team at the medical center
  - OT, PT, SLP
- Home Care Nurse in the home utilizes a tablet

Transitional care from hospital or nursing home

- Natural environment
- Patient and Family/Caregiver Satisfaction
- Reduce Caregiver Burdens (travel, time off, costs)
- Increased frequency, intensity, salience (principles of neurorehabilitation)
- Revise Plan of Care in real time

Training modules available at: <http://www.rstce.pitt.edu/varha/>



### Kitchen Accessibility



# Program for Intensive Residential Aphasia Treatment and Education (PIRATE)

Pittsburgh VAMC

- 10,371 unique Veterans with aphasia enrolled
- 3198 (30%) received speech-language rehabilitation services
- The average treatment dose was 12 hours of therapy.



# Aphasia

Aphasia treatment is a dynamic interactive process requiring use of auditory-verbal communication, gestures, writing, drawing, non-verbal cues.

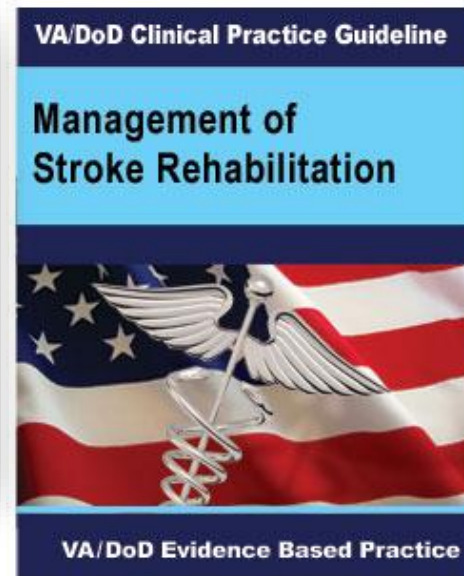


# A Review of the Evidence for the Use of Telemedicine within Stroke Systems of Care: A Scientific Statement from the American Heart Association/American Stroke Association

Schwamm, L. H., Holloway, R. G., et al. (2009). Stroke, 40(7), 2616-2634.

Assessment of occupational, physical, or speech disability in stroke patients by allied health professionals via high-quality video conferencing systems using specific standardized assessments is recommended when in-person assessment is impractical, the standardized rating instruments have been validated for high-quality video conferencing use, and administration is by trained personnel using a structured interview"

<https://www.healthquality.va.gov/guidelines/Rehab/stroke/>



# Intensive Dysphagia Treatment

Madison VAMC

Historically, only 3.9 sessions vs 8 weeks

## Device Facilitated Progressive Resistance

- Lingual strengthening, expiratory muscle strength training, surface electromyography
- Provide biofeedback to accuracy of exercises completed
- Therapeutic targets are established at baseline, increased systematically



# Organ Preservation Program: Radiation and Chemotherapy for H&N Cancer Madison and Gainesville VAMC

- Side effects may include xerostomia, trismus and dysphagia
- Evidence based exercises - “Use it” (8 weeks)
- Monitor for toxicities (mucositis, yeast infections)
- Monitor nutrition and hydration (weight loss and dehydration)
- Follow-up post radiation 1, 3, 12 month intervals for up to 5 years





# Telehealth Mentoring

## Fluoroscopic Exam of Swallow Function



# Assistive Technology



## Includes:

- Cognitive Aids
- Computer Aids
- Wheelchair Seating
- Communication Aids
- Adaptive Sports/Recreational
- Adaptive Driving
- Environmental Controls



# Cognitive Rehab





Defense and Veterans Brain Injury Center

Traumatic Brain Injury (TBI) Center of Excellence for the Defense Health Agency (DHA)

Cognitive Rehabilitation for Service Members and Veterans Following Mild to Moderate Traumatic Brain Injury: *Clinical Recommendations and Clinical Resource*

<https://dvbic.dcoe.mil/cogrehab/index.html>

Interventions and Strategies to Address Cognitive Dysfunction

Department of Defense (DoD) and Department of Veterans Affairs (VA) affiliated clinical resources for each set of clinical recommendations.

This guideline's recommendations detail cognitive rehabilitation interventions and service delivery considerations for individuals in the post-acute and chronic stages of recovery following mild-to-moderate traumatic brain injury. It was developed specifically for speech-language pathologists, occupational therapists, neuropsychologists and other providers of cognitive rehabilitation at military and VA hospitals and clinics. Although the guideline was developed for service members and veterans, the evidence included patients from outside of this specific population, indicating wider applicability.

# VA App Store

The screenshot shows the VA App Store website. At the top left is the U.S. Department of Veterans Affairs logo. To its right is the text "U.S. Department of Veterans Affairs" and a search bar. Below the logo is a navigation menu with items: Health, Benefits, Burials & Memorials, About VA, Resources, Media Room, Locations, and Contact Us. On the left side, there is a sidebar menu with items: VA Mobile Health, Developing VA Apps, VA App Store, Provider Program, and Field Tests. Below the sidebar menu are three logos: "Veterans Crisis Line" with the number 1-800-273-8255, "My healthvet" with the tagline "My Health, My Care 24/7 Access to VA", and "VA CARE" with the tagline "Defining EXCELLENCE in the great Country". The main content area features the "VA App Store" logo and a welcome message: "Welcome to the VA App Store! Here you will find access to more than a dozen apps, including those created specifically for Veterans and their Healthcare Professionals." Below this is a security notice: "DS Logon Required For your security, Apps displaying the lock icon require a DS Logon Level 2 (Premium) Account because they connect to your VA Electronic Health Record (EHR). Get a DS Logon Level 2 (Premium) Account". The main content area displays a grid of nine app cards, each with an icon, name, and star rating:

- 311VET**: 311VET icon, 4.5 stars
- ACT Coach**: ACT Coach icon, 4.5 stars
- Airborne Hazards and Open Burn Pit Registry**: Airborne Hazards and Open Burn Pit Registry icon, 4.5 stars
- Annie App for Clinicians**: Annie App for Clinicians icon, 4.5 stars
- Annie App for Veterans**: Annie App for Veterans icon, 4.5 stars
- Antbiogram App**: Antbiogram App icon, 4.5 stars
- Ask a Pharmacist**: Ask a Pharmacist icon, 4.5 stars
- Caring4WomenVeterans App**: Caring4WomenVeterans App icon, 4.5 stars
- CBT-i Coach**: CBT-i Coach icon, 4.5 stars

# Stand Alone Mental Health Apps



- Apps are native and do not connect to the VA network.
- Apps are regularly used as part of VA treatment.
- Apps are also available to any interested clinicians & patients.



# Personal Health Portal Secure Messaging

- Secure Messaging
- Prescriptions
- Appointments
- Journaling
- Nutrition
- Weights
- Home Exercise Programs



# Texting

  
annie



- Text messaging capability that promotes self-care for Veterans enrolled in VA health care.
- Care team members enroll Veterans into Annie and set up protocols based on the Veterans' care plan.
  - Annie then sends reminders or other automated messages to patients asking them to track and log certain health care data.
- Veterans can use Annie with a basic cell phone that includes a texting feature.

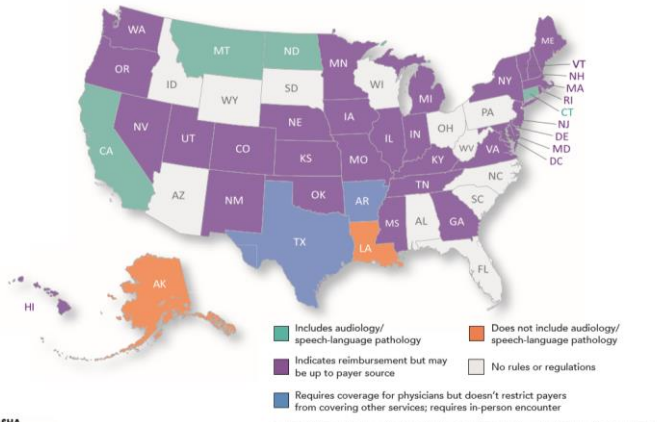


# Competency Checklist

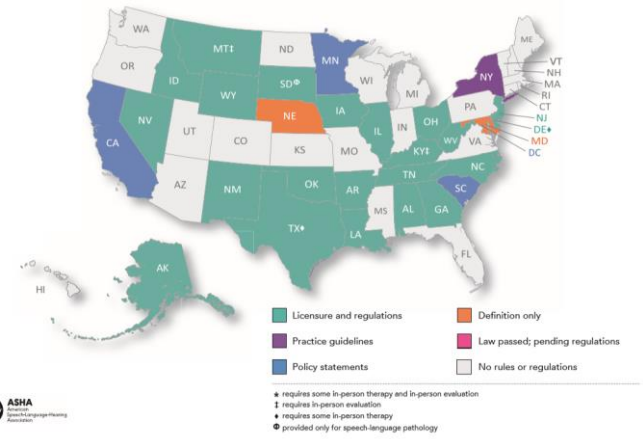
- Professional competencies (knowledge and skills)
- Telehealth competencies (technical skills)

# Insurance Regulations and Licensure

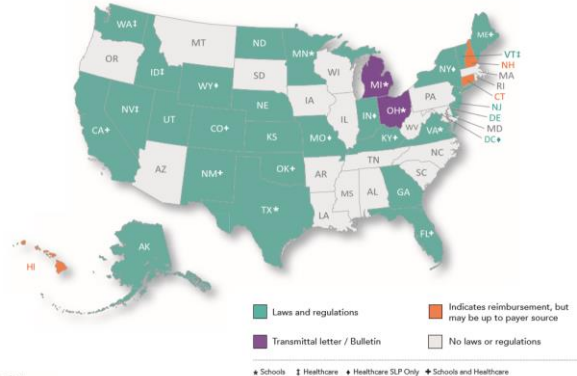
## Telepractice Reimbursement Audiology & Speech-Language Pathology



## Telepractice Requirements Audiology & Speech-Language Pathology



## Medicaid Laws & Regulations Telepractice Reimbursement Audiology & Speech-Language Pathology



# Centers for Medicare and Medicaid Services

## CMS COVID-19

- For more information on the COVID-19 waivers and guidance, and the Interim Final Rule, please go to the CMS COVID-19 flexibilities webpage:  
<https://www.cms.gov/files/document/summary-covid-19-emergency-declaration-waivers.pdf>  
<https://www.cms.gov/about-cms/emergency-preparedness-response-operations/current-emergencies/coronavirus-waivers>
- CMS directed a historic expansion of telehealth services so that doctors and other providers can deliver a wider range of care to Medicare beneficiaries in their homes. Beneficiaries thus don't have to travel to a healthcare facility and risk exposure to COVID-19.
- For the duration of the COVID-19 emergency, CMS is waiving limitations on the types of clinical practitioners that can furnish Medicare telehealth services. Prior to this change, only doctors, nurse practitioners, physician assistants, and certain others could deliver telehealth services. Now, other practitioners are able to provide telehealth services, including physical therapists, occupational therapists, and speech language pathologists.

# ASHA Reimbursement

(check regularly for updates)

- <https://www.asha.org/About/Coronavirus-Updates/>
- <https://www.asha.org/Practice/reimbursement/Payment-and-Coverage-Considerations-for-Telepractice-Services-During-Coronavirus/>
- <https://www.asha.org/Practice/reimbursement/medicare/Providing-Telehealth-Services-Under-Medicare-During-the-COVID-19-Pandemic/>

# American Speech-Language Hearing Association



- Telepractice Resources:
  - <https://www.asha.org/About/Telepractice-Resources-During-COVID-19/>
- Updates regarding State policies and telepractice during the coronavirus pandemic:
  - <https://www.asha.org/Advocacy/state/default/>
- Updates regarding insurance and Medicaid:
  - <https://www.asha.org/uploadedFiles/COVID-19-Commercial-Insurance-Telepractice-Policy-Tracking.pdf>
  - <https://www.asha.org/uploadedFiles/COVID-19-State-Medicaid-Telepractice-Policy-Tracking.pdf>

# American Occupational Therapy Association

- Telehealth in Occupational Therapy
  - American Journal of Occupational Therapy, December 2018, Vol. 72, 7212410059.  
<https://ajot.aota.org/article.aspx?articleid=2719223>

Patient centered evaluation, intervention, consultation and monitoring:

Examples:

- Neuro and chronic progressive conditions; (e.g., TBI, Stroke; SCI, ALS)
- Musculoskeletal conditions, Shoulder and hand injuries; Lymphedema; Pain Management; pre and post op ortho
- Cardiovascular conditions (e.g., COPD, post COVID- 19)
- Mental Health; Integrated health
- Dementia and Alzheimer; Caregiver training, Productive aging
- Wheeled mobility; (standard and custom) assessment, fitting and training
- Wheeled power mobility; evaluation and training (with support)
- Home Safety; assessment and recommendations for environmental modifications, (e.g., HISA, DME)
- Driving; safe passenger evaluation

# American Physical Therapy Association

Link to telehealth resources (legislation, billing, references):

<http://www.apta.org/search.aspx?q=Telehealth>

- Lee ACW, Billings M. Telehealth implementation in a skilled nursing facility: case report for physical therapist practice in Washington. *Phys Ther.* 2016;96:252–259.
- Clark PG, Dawson SJ, Scheideman-Miller C, Post ML. TeleRehab: Stroke Teletherapy and Management Using Two-Way Interactive Video. *Neurology Report.* 2002; 26(2) 87-93.
- Cottrell, MA, Galea OA, O’Leary SP, Hill, AJ, Russell, TG. Real-time telerehabilitation for the treatment of musculoskeletal conditions is effective and comparable to standard practice: A systematic review and meta-analysis. *Clinical Rehabilitation.* 2016; May 2 1-14.

Communication is a basic and most important human skill that enables us to interact and share information with each other.

## Better Hearing & Speech Month

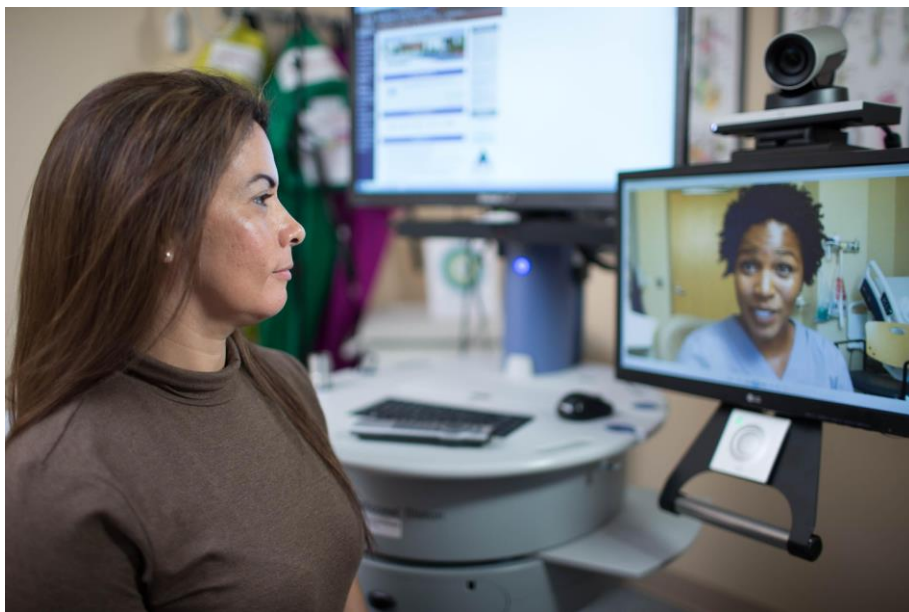


**BH | 20**  
**SM | 20**

**Communication at Work**



# Questions?





With malice toward none, with charity for all, with firmness in the right as God gives us to see the right, let us strive on to finish the work we are in, to bind up the nation's wounds, to care for him who shall have borne the battle and for his widow and his orphan, to do all which may achieve and cherish a just and lasting peace among ourselves and with all nations.



*Abraham Lincoln, Second  
Inaugural Address, March 4, 1865*



# References

# Overview of Telehealth Activities in Speech-Language Pathology

Pauline A. Mashima and Charles R. Doarn. Telemedicine and e-Health. Dec 2008. 1101-

1117. <http://doi.org/10.1089/tmj.2008.0080>

Published in Volume: 14 Issue 10: January 2, 2009

- Speech-language pathologists (SLP) and rehabilitation specialists are predicted to be in short supply. The application of telemedicine and telehealth offers solutions to this challenge. An extensive review of the literature was conducted to determine what has been done in SLP with telemedicine and how it can provide a strong foundation for broader applications.
- It is estimated that 10% of the world's population, approximately 650 million people, have some form of disability. Population growth, aging, and medical advances that preserve and prolong life have increased demands for health and rehabilitation services. Recent predictions indicate a shortage of speech-language pathologists and other rehabilitation specialists to provide care for individuals with disabilities. The application of telemedicine and telehealth technologies offers effective solutions to this challenge. An extensive literature review was conducted that included technical reports, websites, publications from the American Speech-Language-Hearing Association, and peer-reviewed journal articles of telehealth applications in speech-language pathology. Various applications of telehealth in speech-language pathology are described including types of technology, patient and clinician satisfaction, advantages of using telehealth, challenges and barriers to application, and future directions. This review provides a strong foundation for broader applications of telehealth technologies in this area of healthcare.

## **Assessing dysphagia via telerehabilitation: Patient perceptions and satisfaction**

SHOBHA SHARMA<sup>1,2</sup>, ELIZABETH C. WARD<sup>1,3</sup>, CLARE BURNS<sup>4</sup>, DEBORAH THEODOROS<sup>1</sup> & TREVOR RUSSELL<sup>1</sup>

*<sup>1</sup>The University of Queensland, Brisbane, Australia, <sup>2</sup>National University of Malaysia, Kuala Lumpur, Malaysia, <sup>3</sup>Centre for Functioning and Health Research, Queensland Health, Brisbane, Australia, and <sup>4</sup>Royal Brisbane and Women's Hospital, Brisbane, Australia*

Examined patient perceptions BEFORE and AFTER engaging in a clinical swallowing assessment via telehealth. Using a 5-point Likert scale, 92% of patients felt comfortable undergoing a clinical swallowing exam via telehealth; however only 30% would prefer to telehealth assessment over face-to-face.

## **Dysphagia Management via Telerehabilitation: A Review of the Current Evidence**

Elizabeth C Ward, Clare L Burns

Clinician-reported barriers to using telehealth: issues with technology, tech support, and connectivity, tech limitations for certain uses, lack of reimbursement or funding, lack of training in its use, and lack of evidence of effectiveness.

With the right equipment and an assistant at the patient end, telehealth allows for the same clinical accuracy as FTF regardless of patient severity (Ward et al., 2014) for CSE.

Evidence is in its infancy, but indicators for delivering dysphagia management services in the future via telehealth are promising.

# **Examining user perceptions of SwallowIT: A pilot study of a new telepractice application for delivering intensive swallowing therapy to head and neck cancer patients**

**Laurelie R Wall<sup>1,2,3</sup>, Elizabeth C Ward<sup>1,2</sup>, Bena Cartmill<sup>1,4</sup>,  
Anne J Hill<sup>2,3</sup> and Sandro V Porceddu<sup>5,6</sup>**

*Journal of Telemedicine and Telecare*

2017, Vol. 23(1) 53–59

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DOI: 10.1177/1357633X15617887

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Examined the end-users perceptions of an asynchronous telepractice application designed to support patients remotely who are completing intensive swallowing therapy during CRT for HNC.

Examined ease of use of the application, motivating factors, challenges, and personal preferences for service delivery models.

Bottom line: patients reported that the tele-monitoring involved made them more accountable and reminded them to do their exercises; worked for some but not all, so patient preference should always be factored in when possible and consider hybrid approaches.

# A telehealth approach to oropharyngeal dysphagia therapy

Helena Bascuñana<sup>1</sup>, Berenice Blanco<sup>3</sup>, Yliana Rivero<sup>3</sup>, Josep Monguet<sup>2</sup>, José Luis Muñoz<sup>2</sup>, Mónica Sampieri<sup>3</sup>  
June 2010

<sup>1</sup> Hospital de Sant Pau. Servicio de Rehabilitación y Terapia; <sup>2</sup> Universidad Politécnica de Cataluña; <sup>3</sup> Sicta

Aim: compare conventional FTF therapy with telemedicine approach to treating neurogenic dysphagia.

Claims:     More patients can access treatment  
              Treatment costs were reduced  
              Improve clinical productivity

- No published outcome data to date – rather description of the e-dis system
- Patients watch videos of the targeted exercises
- Patients make videos of their practice and send to the examiners for feedback
- Examiners provide written feedback to the patients



# Dysphagia Practice in 2035: Beyond Fluorography, Thickener, and Electrical Stimulation

**Michelle R. Ciucci, Ph.D.,<sup>1,2</sup> Corinne A. Jones, M.S.,<sup>1,2</sup>  
Georgia A. Malandraki, Ph.D.,<sup>3</sup> and Katherine A. Hutcheson, Ph.D.<sup>4</sup>**

“With 22% of the U.S. population living in rural areas, and a relatively limited number of dysphagia-specialized SLPs globally, the development of telehealth is essential in underserved communities and among patients who have restricted mobility.”

“...evidence has accumulated supporting both the feasibility and reliability of teledynamic clinical swallowing assessments...Regarding dysphagia teletreatment, evidence is scarce including case studies or small-scale satisfaction surveys on the use of dysphagia apps.”

“...it is clear that significant research efforts are needed before dysphagia telehealth can be widely adopted”

## Assessing swallowing disorders online: a pilot telerehabilitation study.

Sharma S<sup>1</sup>, Ward EC, Burns C, Theodoros D, Russell T.  
Telemed J E Health. 2011 Nov; 17(9): 688-95.

Dysphagia (a swallowing disorder) is known to occur in numerous clinical populations, but unfortunately because of issues accessing speech pathology services, not all patients are able to receive dysphagia intervention and rehabilitation services in a timely manner. Existing research supports the use of telehealth technology for providing various aspects of speech pathology service; however, to date there is limited evidence to support the utilization of telerehabilitation in the assessment and management of dysphagia. The aim of this research was to provide pilot information on the basic feasibility and validity of conducting dysphagia assessments via telerehabilitation.

### **MATERIALS AND METHODS:**

Ten simulated patients, actors portraying patients with a range of swallowing difficulties, were used rather than actual patients to minimize any potential patient risk from unidentified aspiration. Dysphagia was assessed simultaneously by a face-to-face (FTF) and telerehabilitation speech pathologist (T-SP). Each simulated patient was assessed using a Clinical Swallowing Examination (CSE) protocol that was modified to suit a telerehabilitation environment. The CSE was administered with the support of an assistant via an Internet-based videoconferencing telerehabilitation system using a bandwidth of 128 kilobits per second.

### **RESULTS:**

Results revealed high to excellent levels of agreement between the T-SP and the FTF-SP across all parameters of the CSE. Agreement for aspiration risk was excellent.

### **CONCLUSION:**

The pilot data indicate that the current model of administering a CSE via telerehabilitation has potential to be a feasible and valid method for the remote assessment of swallowing disorders.

## Real-Time Remote Telefluoroscopic Assessment of Patients with Dysphagia

Adrienne L. Perlman , Weerasak Witthawaskul

Dysphagia volume 17, pages162–167(2002)

Dysphagia is a serious health problem that affects persons of all ages, from the neonate to those of advanced age. Many smaller communities and areas with sparse populations do not have regular access to professionals with expertise in the area of oral/pharyngeal dysphagia. Telemedicine is one method by which people in these areas can receive quality of service. The intent of this work was to develop an Internet system that permits real-time, remote, interactive evaluation of oral/pharyngeal swallowing function. The system consists of two major components. The first is a PC that is located in the fluoroscopy suite of a hospital. The computer is connected to the fluoroscope output and is responsible for (1) capturing video signals, (2) converting the analog video data into digitized video formats of both full resolution and transmission-optimized resolution, (3) simultaneously transmitting the transmission-optimized video stream over the network while the examination is being performed, and (4) storing the full-resolution data as a file in local storage for later retrieval. The second component is the controller computer which is located at a site some distance from the hospital. That controller computer manages the video capture process at the remote hospital site, manages the transmission of the stored images, and is then used for video analysis. The delay between the image as it was captured at the remote hospital site and viewed on the controller computer in the Principal Investigator's (PI's) laboratory ranged from 3 to 5 s. Video transmission occurred over a standard T1 line.

## Voice Therapy Using Telecommunications Technology

Pauline A. Mashima , Deborah P. Birkmire-Peters, Mark J. Syms , Michael R. Holtel, Lawrence P. A. Burgess and Leslie J. Peters  
[https://doi.org/10.1044/1058-0360\(2003/089\)](https://doi.org/10.1044/1058-0360(2003/089))

American Journal of Speech-Language Pathology, November 2003 Volume 12, Issue 4, Pages: 432-439  
<https://pubs.asha.org/toc/ajslp/12/4>

Telehealth offers the potential to meet the needs of underserved populations in remote regions. The purpose of this study was a proof-of-concept to determine whether voice therapy can be delivered effectively remotely. Treatment outcomes were evaluated for a vocal rehabilitation protocol delivered under 2 conditions: with the patient and clinician interacting within the same room (conventional group) and with the patient and clinician in separate rooms, interacting in real time via a hard-wired video camera and monitor (video teleconference group). Seventy-two patients with voice disorders served as participants. Based on evaluation by otolaryngologists, 31 participants were diagnosed with vocal nodules, 29 were diagnosed with edema, 9 were diagnosed with unilateral vocal fold paralysis, and 3 presented with vocal hyperfunction with no laryngeal pathology. Fifty-one participants (71%) completed the vocal rehabilitation protocol. Outcome measures included perceptual judgments of voice quality, acoustic analyses of voice, patient satisfaction ratings, and fiber-optic laryngoscopy. There were no differences in outcome measures between the conventional group and the remote video teleconference group. Participants in both groups showed positive changes on all outcome measures after completing the vocal rehabilitation protocol. Reasons for participants discontinuing therapy prematurely provided support for the telehealth model of service delivery.

# Videophone-Delivered Voice Therapy: A Comparative Analysis of Outcomes to Traditional Delivery for Adults with Parkinson's Disease

Lyn R. Tindall, Ruth A. Huebner, Joseph C. Stemple, and Harold L. Kleinert  
**Telemedicine and e-Health** Vol. 14, No. 10 ORIGINAL RESEARCH  
Published Online: 5 Mar 2009 <https://doi.org/10.1089/tmj.2008.0040>

- Idiopathic Parkinson's Disease (IPD) implies significant communications impairment in speech that can be ameliorated by a standard intensive instruction delivered face-to-face. The same regimen was delivered through videophones placed in the homes of individuals with IPD and found equivalent in therapeutic outcome to face-to-face results.
- Individuals with idiopathic Parkinson's disease (IPD) usually develop a speech disorder characterized by reduced loudness, hoarse and breathy voice, monotony of pitch, short rushes of speech, and imprecise consonants. The inability to effectively communicate impairs their ability to function in society and quality of life. A successful program developed to improve speech in these individuals is the Lee Silverman Voice Treatment (LSVT)®. A critical component of this treatment is intense daily therapy for 4 weeks, a regimen that is difficult for many elderly patients to complete. Treatment delivered through videophones placed in the homes of individuals with IPD offers an alternative and could improve accessibility of treatment if the results were the same. This study compared the outcomes of LSVT® delivered via videophones to the outcomes of traditional treatment delivered face-to-face.

# Assessment and Treatment of Cognition and Communication Skills in Adults With Acquired Brain Injury via Telepractice: A Systematic Review

Coleman, J. J., Frymark, T., et al. (2015).

American Journal of Speech-Language Pathology, 24(2), 295-315.

- Overall, participants expressed comfort and satisfaction with telepractice as a delivery model for speech-language pathology assessment and treatment. Some participants expressed indifference to service delivery method. Some stated their lack of Internet access at home would preclude their ability to receive telepractice services.
- Results indicated equivalence of telepractice and in-person modalities for assessment of cognitive impairment in acquired brain injury. No studies were found for assessment of cognitive activity limitations/participation restrictions.
- Assessment scores for language impairment in acquired brain injury were not significantly different between telepractice and in-person administration, suggesting equivalence of the two modalities. Significant ( $p = .04$ ) differences between narrative writing assessment scores in telepractice versus in-practice assessments were found in one study. "However, the authors adopted a stringent alpha level of .01 due to the multiplicity of testing and, as such, did not consider this finding at the  $p = .04$  level to be statistically significant"
- Three studies compared telepractice and in-person assessments of motor speech for adults with acquired brain injury. High interrater reliability scores and a lack of statistically significant differences between test scores suggested equivalence between the assessment modalities for motor speech impairment. Exceptions were noted for the measurement of communication efficiency and word intelligibility which displayed statistically significant differences (or trending toward significant) between the assessment modalities. One study compared telepractice and in-person assessments of motor speech activity limitations/participation. Results from this study did not suggest equivalence between the assessment modalities. Interrater reliability was higher for telepractice than in-person assessment.
- Three studies examined cognitive treatments with no differences found between in-person and remote conditions on cognitive impairments and activity limitations/participation restrictions. No studies examined motor speech or language treatments. Further research is warranted.

## Telerehabilitation Versus Standard Care for Improving Cognitive Function and Quality of Life for Adults With Traumatic Brain Injury: A Systematic Review

Betts, S., Feichter, L., et al. (2018).

Internet Journal of Allied Health Sciences & Practice, 16(3), 1-16.

- *Australian colleagues completed a systematic review to examine the effectiveness of telerehabilitation for adults following traumatic brain injury.*
- Overall, there is evidence to indicate that telerehabilitation may be as effective as other formats for the delivery of cognitive and psychological interventions addressing memory and quality of life in adults with mild to severe traumatic brain injury. However, due to methodological issues with the examined studies including potential allocation bias, attrition bias, and performance bias, additional research in this area is warranted.

## **Computer-Based Cognitive Rehabilitation Interventions for Traumatic Brain Injury: A Critical Review of the Literature**

Fetta, J., Starkweather, A., et al. (2017).

The Journal of Neuroscience Nursing, 49(4), 235-240.

- The aim of this study was to provide a synthesis and critical review of current research studies that have tested the efficacy of computer-based interventions on cognitive performance after mild traumatic brain injury.
- There is weak evidence that computer-based cognitive rehabilitation approaches can improve working memory and other cognitive domains. This evidence is of low quality due to the included studies' mixed populations of injury type, severity, age ranges, and time since injury as well as the heterogeneity of interventions and cognitive measures used. Therefore, it is difficult to draw conclusions specific to mild TBI and further research in this area is warranted.



## 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.
- Three studies supported the cost-effectiveness and viability of using telehealth for assessment, diagnosis, and telemonitoring of voice disorders in individuals with Parkinson's disease.
- Six papers were found comparing telepractice to face-to-face assessment for dysphagia. Most of the studies reported both improved access to and quality of care. Early diagnosis and treatment for dysphagia was emphasized. Barriers to implementation included internet speed, individual computer skills, and accessing patient health data. It should be noted that of the studies included, Four were authored by the same or similar group of individuals, and two of those studies appear to share at least some portion of participants; and two are pilot studies, one of which used simulated patients.

## **Do Patients Treated for Voice Therapy With Telepractice Show Similar Changes in Voice Outcome Measures as Patients Treated Face-To-Face?**

Rangarathnam, B., Gilroy, H., et al. (2016).

Included studies addressed treatments such as Lee Silverman Voice Therapy, confidential voice or vocal function exercises, vocal hygiene, flow phonation exercises, relaxation exercises, and Lessac-Madsen Resonant Voice Therapy. Evidence supported comparable treatment effectiveness for service delivery methods (telepractice and face-to-face). Limitations included the broad variety of treatments for voice disorders, and an overall lack of quantitative evidence.

## **A pilot trial of a speech pathology telehealth service for head and neck cancer patients.**

Burns CL<sup>1</sup>, Ward EC, Hill AJ, Malcolm K, Bassett L, Kenny LM, Greenup P. *Telemed Telecare*. 2012 Dec;18(8):443-6. doi: 10.1258/jtt.2012.GTH104. Epub 2012 Dec 3.

We explored the feasibility of providing access to specialist speech pathology services via telehealth for patients with head and neck cancer. A weekly telehealth clinic was conducted between the speech pathology departments of a tertiary hospital and a regional hospital in Queensland. Over a 5-month period, 50 telehealth sessions were conducted for 18 patients. There were 38 patient consultations, nine case discussions between clinicians and three clinical training sessions relating to the skills needed for specific client management (e.g. voice prosthesis selection). Eight sessions had multidisciplinary involvement. All cases were successfully managed via telehealth. All patients agreed that they were comfortable using telehealth and would be happy to use it again in future. Both clinicians agreed that they could competently assess patients using the telehealth system. There appeared to be financial benefits for the patient, because by receiving specialist intervention at a local facility their travel expenses were lower. There was also the opportunity for workforce training and development through online case discussion and clinical consultation.

## **Cognitive Telerehabilitation in Mild Cognitive Impairment, Alzheimer's Disease and Frontotemporal Dementia: A Systematic Review**

Cotelli, M., Manenti, R., et al. (2017). Journal of Telemedicine and Telecare

- The purpose of this systematic review is to examine the evidence for the efficacy of cognitive telerehabilitation interventions compared with face-to-face rehabilitation in patients with mild cognitive impairment, Alzheimer's disease and frontotemporal dementia.
- The available evidence for the effectiveness of cognitive telerehabilitation is limited, and the quality of the evidence needs to be improved. The systematic review provides preliminary evidence suggesting that cognitive telerehabilitation for neurodegenerative disease may have comparable effects as conventional in-person cognitive rehabilitation.
- Overall, the findings revealed that cognitive interventions delivered via telehealth were comparable to those delivered in a conventional face-to-face treatment format for individuals with mild cognitive impairment or Alzheimer's disease. While improved cognitive skills were noted after both service delivery methods, further research is needed due to the small number of studies, heterogeneity of participants, and methodological limitations.

## **Assessment of communication and swallowing post-laryngectomy: a telerehabilitation trial.**

Ward E<sup>1</sup>, Crombie J, Trickey M, Hill A, Theodoros D, Russell T.  
J Telemed Telecare. 2009;15(5):232-7. doi: 10.1258/jtt.2009.081204.

Ten laryngectomy patients were assessed using a purpose-designed, multimedia videoconferencing system incorporating a freestanding, self-focusing camera. Swallowing, stoma and communication status were assessed simultaneously by a remote clinician and face-to-face, by a second clinician at the patient's site. The remote trial took place over a distance of approximately 1700 km using a commercial 3G phone network. A satisfaction questionnaire was also completed. There was excellent agreement between the two assessing clinicians. Image quality obtained via the freestanding camera was rated as lower than direct observation, but it was sufficient to assess the stoma and status of the voice prosthesis. During the trial, occasional difficulties with audio delays and image distortion were experienced, although these were manageable. Both patient and clinician satisfaction with remote assessment was high. The results provide further evidence to support the use of telerehabilitation for evaluating the speech and swallowing status of laryngectomy patients following discharge from acute care.

## **Telepractice in the Assessment and Treatment of Individuals With Aphasia: A Systematic Review**

Hall, N., Boisvert, M., et al. (2013).

International Journal of Telerehabilitation, 5(1), 27-38.

Four studies compared the effectiveness of aphasia assessments delivered in-person and via telepractice and four studies compared the effectiveness of aphasia treatments delivered in-person and via telepractice. An additional two studies examined the effectiveness of teleconferencing to conduct consultations or administer outcome questionnaires. All studies found no differences between service delivery models suggesting that telepractice is a viable service delivery option for individuals with aphasia. However, given the paucity of studies included, further research is needed.

## **Validity of conducting clinical dysphagia assessments for patients with normal to mild cognitive impairment via telerehabilitation.**

Ward EC<sup>1</sup>, Sharma S, Burns C, Theodoros D, Russell T.

Dysphagia. 2012 Dec;27(4):460-72. doi: 10.1007/s00455-011-9390-9. Epub 2012 Jan 20.

To assess the validity of conducting clinical dysphagia assessments via telerehabilitation, 40 individuals with dysphagia from various etiologies were assessed simultaneously by a face-to-face speech-language pathologist (FTF-SLP) and a telerehabilitation SLP (T-SLP) via an Internet-based videoconferencing telerehabilitation system. Dysphagia status was assessed using a Clinical Swallowing Examination (CSE) protocol, delivered via a specialized telerehabilitation videoconferencing system and involving the use of an assistant at the patient's end of the consultation to facilitate the assessment. Levels of agreement between the FTF-SLP and T-SLP revealed that the majority of parameters reached set levels of clinically acceptable levels of agreement. Specifically, agreement between the T-SLP and FTF-SLP ratings for the oral, oromotor, and laryngeal function tasks revealed levels of exact agreement ranging from 75 to 100% (kappa = 0.36-1.0), while the parameters relating to food and fluid trials ranged in exact agreement from 79 to 100% (kappa = 0.61-1.0). Across the parameters related to aspiration risk and clinical management, exact agreement ranged between 79 and 100% (kappa = 0.49-1.0). The data show that a CSE conducted via telerehabilitation can provide valid and reliable outcomes comparable to clinical decisions made in the FTF environment.