



Published in final edited form as:

*Arch Phys Med Rehabil.* 2023 December ; 104(12): 2191–2197. doi:10.1016/j.apmr.2023.02.027.

## Telerehabilitation Strategies and Resources for Rehabilitation Professionals

Emily Kringle,

Molly Trammell,

Elena Donoso Brown,

American Congress of Rehabilitation Medicine (ACRM) Stroke International Special Interest Group

This IEP is designed as a starting point for interprofessional clinical teams who are interested in providing telerehabilitation options to their clients. This is a high-level overview of key topics with guidance for deeper exploration when developing telerehabilitation programs.

### What is telerehabilitation?

Telerehabilitation is a type of telehealth that encompasses all disciplines who provide care for populations with a range of disabilities. This includes the use of telecommunication for remote patient care, usually with minimal or no direct patient contact from the provider.<sup>1</sup> The largely performance-based nature of rehabilitation services requires unique approaches to delivering rehabilitation remotely via telecommunication devices.

- Synchronous delivery:
  - Teleconferencing: 2-way audiovisual link between a patient and health care professional in different locations
  - Audio-only: Visits done by patient portals and messaging technologies
- Asynchronous delivery:
  - Remote patient-monitoring tools
  - Store and forward technologies: Collecting images, educational material, or data to send at a later date
- Commonly used telerehabilitation devices:
  - Smartphone

This I/EP was developed by Emily Kringle, PhD, OTR/L (ekringle@umn.edu).

Authorship

Molly Trammel, DPT; Elena Donoso Brown, PhD, OTR/L on behalf of the American Congress of Rehabilitation Medicine (ACRM) Stroke International Special Interest Group.

**Publisher's Disclaimer:** This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

- Tablet
- Computer
- Telephone (landline, cell phone)

Inclusion of all delivery methods is important to think about as not all clients will have access to all types of technology.<sup>2</sup> Although some principles in this document apply across delivery methods, specific strategies included emphasize approaches for synchronous delivery.

### **Why chose telerehabilitation?**

- May be able to ask and get answers quicker
- More timely diagnosis
- More access to medical specialist and other health care professionals when distance and transportation are hard
- Decreased cost
- More flexible for scheduling
- Decrease spread of COVID-19 and other infections<sup>3</sup>

### **What are the regulations around using telerehabilitation?**

Regulatory guidance should be checked frequently because the healthcare environment constantly changes. Guidance is provided by both federal and state agencies as well as professional organizations. Providers can use resources from their professional organizations, state practice acts, and government regulatory bodies<sup>4</sup> for information on licensure, HIPPA & confidentiality, and billing for telerehabilitation (Table 2).

### **As a rehabilitation provider, what is my role in regulatory guidance for telerehabilitation?**

Clinical settings are now developing policies to guide the local practice of telerehabilitation. Rehabilitation practitioners can contribute to the development these policies. In addition, clinical practitioners have a responsibility to advocate for current issues related to telerehabilitation services in collaboration with professional organizations.

### **How do I develop my skills for delivering telerehabilitation?**

Best practice recommends that clinicians and providers complete training for delivering telerehabilitation.<sup>5</sup> Certifications and continuing education credits are available through public and private organizations.<sup>6</sup> The telerehabilitation environment continues to evolve. Therefore, it is important to integrate new evidence and advances in the ethical, administrative, clinical, and technical aspects of telerehabilitation. This should specifically focus on new and emerging data related to the appropriateness of delivering telerehabilitation in specific clinical scenarios.<sup>7,8</sup>

## Is telerehabilitation right for my patient?

There are many things to think about when choosing ways to give care to clients. A provider may choose telerehabilitation, hybrid or in-person delivery of services (Table 1).<sup>2,9</sup>

## How do I get ready for a telerehabilitation visit?

Table 3 describes technological and non-technological points to talk about with the patient before the session. If the patient wishes to involve their caregiver in the treatment, this is a good time to identify the caregiver.

- When should I connect with the caregiver?<sup>10</sup>
  - This may vary depending on the setting.
    - ◆ Inpatient settings: as early as possible
    - ◆ Outpatient settings: prior to the appointment.
  - Repeated calls may be necessary to connect with the caregiver.

## What are tips for using assessments in telerehabilitation?

The type of assessment impacts the approach that best enables remote assessment using telerehabilitation.

- Interview and self-reported questionnaire-based assessments over telerehabilitation platforms are comparable to in-person administration.<sup>11</sup>
- Performance-based tests require additional planning and may also require assistance from a caregiver during the session.<sup>12,13</sup>
- If completing a performance-based test, identify if there are materials needed for administration and if these can be sent to the client before administration.
- Be prepared to train clients or caregivers on use of features that allow for writing on the screen or organize the screen to increase consistent visual output.

## What are tools for intervention in telerehabilitation?

A variety of tools can be used to support the delivery of physical/mobility, cognition, and mental health rehabilitation interventions that rely on performance or symptom management.

- Mobile applications (apps) are designed for use on a phone or tablet. Some apps that are designed for a phone may not work on a computer.
- Terms in Table 4 can be used to search specific app stores or the internet with the term “app.” For example, “mindfulness app.”

## Acknowledgements:

Dr. Kringle was funded by training and career development grants through the National Institutes of Health National Heart Lung and Blood Institute during the development of this I/EP (T32 HL134634 and K23 HL159240).

The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

#### Disclaimer:

This information is not meant to replace the advice of a medical professional and should not be interpreted as a clinical practice guideline. Statements or opinions expressed in this document reflect the views of the contributors and do not reflect the official policy of ACRM, unless otherwise noted. Always consult your healthcare provider about your specific health condition. This Information/Education Page may be reproduced for noncommercial use for health care professionals and other service providers to share with their patients or clients. Any other reproduction is subject to approval by the publisher.

## References

1. Sorinmade O, Kossoff L, Peisah C. COVID-19 and telerehabilitation in older adult psychiatry—opportunities for now and the future. *Int J Geriatr Psychiatry* 2020;35:1427–1430. 10.1002/gps.5383 [PubMed: 32729632]
2. Rokosh R, Lewis WC, Chaikof EL, Kavrake LE. How should we prepare for the post-pandemic world of telerehabilitation and digital medicine? *NAM Perspectives*. Commentary, National Academy of Medicine, Washington, DC. 10.31478/202106a.
3. Valentino L, Skinner M, Pipe S. The role of telemedicine in the delivery of healthcare in the COVID-19 pandemic. *Haemophilia* 2020;26:e230–e231. 10.1111/hae.14044 [PubMed: 32397000]
4. Office for Civil Rights. FAQs of Telerehabilitation and HIPAA during the COVID-19 nationwide public health emergency. <https://www.hhs.gov/sites/default/files/telerehabilitation-faqs-508.pdf> Accessed October 5, 2022.
5. Miller JM, Sak SS, Keller DR, Gustavson AM, Barnes DE. Physical therapist telehealth delivery at 1 year into COVID-19. *Phys Ther*. 2022: pzac121. 10.1093/ptj/pzac121
6. Health Resources & Services Administration (HRSA). Telehealth training and workforce development. Best Practice Guides. Accessed October 5, 2022. <https://telerehabilitation.hhs.gov/providers/telerehabilitation-training-and-workforce-development/>
7. Richmond T, Peterson C, Cason J, Billings M, Terrell EA, Lee ACW, Towey M, Parmanto B, Saptano A, Cohn E, Brennan D. American Telemedicine Association's principles for delivering telerehabilitation services. *International Journal of Telerehabilitation*, 2017;9(2):63. 10.5195/ijt.2017.6232 [PubMed: 29238450]
8. Little LM, Pickett KA, Proffitt R, Cason J. Keeping Pace with 21<sup>st</sup> Century Healthcare: A framework for telehealth research, practice, and program evaluation in occupational therapy. *International Journal of Telerehabilitation*, 2021;13(1): e6379. 10.5195/ijt.2021.6379
9. Exum E, Hull BL, Lee AC, Gumieny A, Villarreal C, Longnecker D. Applying telerehabilitation technologies and strategies to provide acute care consultation and treatment of patients with confirmed or possible COVID-19. *J Acute Care Phys Ther*. 2020;11(3):103–112. 10.1097/JAT.000000000000143
10. Sansom-Daly U, Bradford N. Grappling with the “human” problem hiding behind the technology: Telerehabilitation during and beyond COVID-19. *Psycho-Oncology*. 2020;29:1404–1408. 10.1002/pon.5462 [PubMed: 32779776]
11. Dreyer NC, Dreyer KA, Shaw DK, Wittman PP. Efficacy of telemedicine in occupational therapy: a pilot study. *J Allied Health*. 2001 Spring;30(1):39–42. [PubMed: 11265272]
12. Worboys T, Brassington M, Ward EC, Cornwell PL. Delivering occupational therapy hand assessment and treatment sessions via telerehabilitation. *J Telemed Telecare*. 2018 Apr;24(3):185–192. 10.1177/1357633×17691861 [PubMed: 29278981]
13. Prasas A, Brewster R, Newman J, Rajasekaran K. Optimizing your telemedicine visit during the COVID-19 pandemic: practice guidelines for patients with head and neck cancer. *Head Neck*. 2020;42:1317–1321. 10.1002/hed.26197 [PubMed: 32343458]

Table 1.

Delivery models

|                                         | Telerehabilitation                                                                                                         | Hybrid                                                                                                                            | In-person delivery                                                                                                                                              |
|-----------------------------------------|----------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Definition                              | All interactions occur remotely                                                                                            | Some interactions occur remotely and some occur in-person                                                                         | All interactions occur in-person                                                                                                                                |
| The injury or illness...                | ...does not lead to quick decline but continues to have therapeutic goals                                                  | ...may lead to quick decline or medical complications                                                                             | ...is newly diagnosed                                                                                                                                           |
| Patient's functional and medical status | ● independent to supervision with interaction and therapy intervention<br>● medical status monitored on an as needed basis | ● still needs physical assistance for some ADLs/mobility<br>● medically stable, however requiring intermittent medical monitoring | ● needs rehabilitation evaluation or intervention based on acute diagnosis<br>● presents with significant physical limitations<br>● requires medical monitoring |
| Caregiver involvement                   | May need caregiver for set up and during sessions                                                                          | May have caregiver to assist at some times and/or caregiver can be trained                                                        | Limited support from caregiver                                                                                                                                  |

**Table 2.****Resources on Telerehabilitation Use and Regulations**

|                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Federal guidance      | <a href="https://telerehabilitation.hhs.gov/providers/">https://telerehabilitation.hhs.gov/providers/</a><br><a href="https://www.cms.gov/Medicare/Medicare-General-Information/Telerehabilitation">https://www.cms.gov/Medicare/Medicare-General-Information/Telerehabilitation</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| State guidance        | Search online for:<br><ul style="list-style-type: none"> <li>• State-specific telerehabilitation guidelines</li> <li>• Discipline-specific licensing regulations</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Professional guidance | Physical Therapy: <a href="https://www.apta.org/your-practice/practice-models-and-settings/telerehabilitation-practice">https://www.apta.org/your-practice/practice-models-and-settings/telerehabilitation-practice</a><br>Occupational Therapy: <a href="https://www.aota.org/Practice/Manage/telerehabilitation.aspx">https://www.aota.org/Practice/Manage/telerehabilitation.aspx</a> Speech Language Pathology:<br><a href="https://www.asha.org/practice-portal/professional-issues/telepractice/#collapse_1">https://www.asha.org/practice-portal/professional-issues/telepractice/#collapse_1</a><br>PM&R: <a href="https://www.aapmr.org/members-publications/covid-19/telemedicine">https://www.aapmr.org/members-publications/covid-19/telemedicine</a><br>Nursing: <a href="https://www.nursingworld.org/practice-policy/advocacy/telerehabilitation/">https://www.nursingworld.org/practice-policy/advocacy/telerehabilitation/</a> |

**Table 3.**

## Setting up a successful telerehabilitation visit

|                                  | Technological                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Non-Technological                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Before the Session</b>        | <ul style="list-style-type: none"> <li>• Ask the client about their device.               <ul style="list-style-type: none"> <li>○ What device(s) do you own?</li> <li>○ Which device do you use regularly?</li> <li>○ Which device do you prefer?</li> <li>○ What do you use the device for?</li> <li>○ How often do you use the device?</li> </ul> </li> <li>• Ask the client about how they use their device:               <ul style="list-style-type: none"> <li>○ Do you use the device independently or does another person help you?</li> <li>○ Do have any trouble seeing or hearing while using your device?</li> <li>○ Do you have any difficulty navigating apps on the device?</li> </ul> </li> <li>• Ask the client about their internet connectivity.               <ul style="list-style-type: none"> <li>○ Will you be using broadband internet or cellular data during the session?</li> <li>○ If using cellular data, do you have any concerns about potential overage charges?</li> </ul> </li> <li>• Hold a test session to identify and address technological problems ahead of time</li> <li>• Send clear instructions on how to access the telerehabilitation environment using the client's preferred method of communication (e.g. email, text, telephone call)</li> <li>• If planning to record, identify regulatory, policy, and institutional rules related to audio and video recording.</li> </ul> | <ul style="list-style-type: none"> <li>• Ask the client about materials needed during the session:               <ul style="list-style-type: none"> <li>○ Do they have access to the materials in their home?</li> <li>○ Make a plan with the client to ensure that they have materials available (e.g., therapist delivers materials, client or caregiver obtains materials).</li> </ul> </li> <li>• Ask the client about their social environment:               <ul style="list-style-type: none"> <li>○ Who else do you want to involve in the session?</li> <li>○ Is there anyone in the household that you do <u>not</u> want involved in your session? How should I approach private or sensitive conversations?</li> </ul> </li> <li>• Make a risk management plan:               <ul style="list-style-type: none"> <li>○ Collect contact information for the client's emergency contacts and a trusted healthcare provider.</li> <li>○ Determine screening procedures for fall risk and other indicators of a medical emergency (e.g. hypertensive crisis).</li> <li>○ Determine procedures for addressing mental health crises, such as suicidal ideation.</li> </ul> </li> <li>• Billing               <ul style="list-style-type: none"> <li>○ Find out if client will need to pay out of pocket for services provided using telerehabilitation.</li> </ul> </li> </ul> |
| <b>On the day of the session</b> | <ul style="list-style-type: none"> <li>• Use the most basic available device required to achieve the session's purpose.</li> <li>• Log in a few minutes early to verify that the technology is working.</li> <li>• Address non-technological problems, such as poor camera angle, when they occur rather than suffering through them.</li> <li>• Give the client your full attention. Let them know if you are looking at their information on a 2<sup>nd</sup> monitor that requires you to look away from the camera.</li> <li>• Make sure the client's alternative and emergency contact information is available in case you get disconnected or there is an emergency.</li> <li>• If audio or video recording, obtain their permission to record prior to turning on the recording device.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <ul style="list-style-type: none"> <li>• Ask the client about the session:               <ul style="list-style-type: none"> <li>○ How do you feel about telerehabilitation?</li> <li>○ Are these telerehabilitation sessions meeting your needs and/or expectations?</li> </ul> </li> <li>• Address non-technological problems, such as excess background noise, when they occur rather than suffering through them.</li> <li>• Acknowledge the challenges and benefits of telerehabilitation.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

**Table 4.**

Tools for rehabilitation interventions delivered using telerehabilitation

| <b>Physical/Mobility</b>      |                                                                                                                                                                                |                                                                                                                                                                                                                                                                        |
|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                               | <b>Definition</b>                                                                                                                                                              | <b>Example or Search Terms</b>                                                                                                                                                                                                                                         |
| Wearable                      | Electronic device that can be worn to collect information continuously from an individual, often information about health for the individual or by the therapist.              | Activity Tracker (e.g., smartwatch, pedometer)                                                                                                                                                                                                                         |
| Home Monitoring               | Use of devices that record health information intermittently                                                                                                                   | Blood pressure machine connected to iPad, blood sugar monitoring, pulse oximeter                                                                                                                                                                                       |
| Apps for Fitness and Mobility | Apps that allow for tracking of health behaviors such as weight, physical activity, and food intake. Can also allow for social connection or gamification of health behaviors. | Search terms for apps: fitness, physical activity, health and wellness                                                                                                                                                                                                 |
| <b>Cognition</b>              |                                                                                                                                                                                |                                                                                                                                                                                                                                                                        |
|                               | <b>Definition</b>                                                                                                                                                              | <b>Example or Search Terms</b>                                                                                                                                                                                                                                         |
| Images/ Screenshots           | Still images or videos to support a client's understanding an intervention activity.                                                                                           | Images: Completing a particular exercise or activity, having an image of the exercise in series or a video<br>Screenshot: Images to support engagement with different feature of a platform or device                                                                  |
| Annotations                   | The ability for clients to draw or write on a shared screen that can facilitate engagement in assessment or intervention sessions.                                             | Function available in videoconferencing software, sometimes called "annotate" or "whiteboard".<br>Clients can mark their responses during activities or questions on the shared screen (e.g., indicating the unsafe situations in pictures viewed on a shared screen). |
| Apps for cognition            | Apps that provide activities to address cognitive issues either work to remedy impairment or compensate by providing external support.                                         | Search terms for apps: memory, vision, language, executive functions, speech, reading, brain games, organization, planning, reading                                                                                                                                    |
| <b>Mental Health</b>          |                                                                                                                                                                                |                                                                                                                                                                                                                                                                        |
|                               | <b>Definition</b>                                                                                                                                                              | <b>Example</b>                                                                                                                                                                                                                                                         |
| Social Engagement             | Use of variety of technological platforms to support social engagement including synchronous meeting platforms, e-mail, discussion boards, social media                        | Support groups meeting via online platforms<br>Search terms for apps: support group for [diagnosis, impairment], social media special interest groups, volunteer, peer mentor, research opportunities, community engagement, reintegration                             |
| Mind-Body Practices           | Use of applications to support training and practice of strategies such as mindfulness, guided visual imagery, meditation, and breathing to decrease anxiety and stress.       | Search terms for apps: meditation, calmness, mindfulness, stress management, yoga, restoration, self-help, anxiety, coping, breathing, visual imagery                                                                                                                  |