

# EBBP *briefs*

A scholarly forum for guiding evidence-based  
practices in speech-language pathology

TELEPRACTICE INTERVENTION FOR DYSPHAGIA  
SECONDARY TO HEAD AND NECK CANCERS

RADISH KUMAR BALASUBRAMANIAM, PhD  
KASTURBA MEDICAL COLLEGE

VINAYA MANCHAIAH, AuD, MBA, PhD  
LAMAR UNIVERSITY

BALAJI RANGARATHNAM, PhD, CCC-SLP  
MIDWESTERN UNIVERSITY

# EBP Briefs

---

## Editor

Mary Beth Schmitt  
*Texas Tech University Health Sciences Center*

## Editorial Review Board

Danielle Werle, PhD, CCC-SLP  
*Atlanta, Georgia*

Joneen Lowman, PhD, CCC-SLP  
*University of Kentucky, College of Health Sciences*

Georgia A. Malandraki, PhD, CCC-SLP, BCS-S  
*Purdue University*

Whitney Schneider-Cline, PhD, CCC-SLP  
*University of Nebraska Kearney*

Breanna Krueger, PhD, CCC-SLP  
*University of Wyoming*

## Managing Director

Tina Eichstadt  
Pearson  
5601 Green Valley Drive  
Bloomington, MN 55437

Cite this document as:

Balasubramaniam, R. K., Manchaiah, V., & Rangarathnam, B.  
(2022). Telepractice intervention for dysphagia secondary to head  
and neck cancers. *EBP Briefs*, 15(4), 1–6. NCS Pearson, Inc.

---



For inquiries or reordering:  
800.627.7271  
[www.PearsonAssessments.com](http://www.PearsonAssessments.com)

Copyright © 2022 NCS Pearson, Inc. All rights reserved.

**Warning:** No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, recording, or any information storage and retrieval system, without the express written permission of the copyright owner.

**Pearson** is a trademark, in the U.S. and/or other countries, of Pearson PLC or its affiliates.  
**Therabite Jaw Motion Rehabilitation System** is a trademark of Atos Medical.

**NCS Pearson, Inc. 5601 Green Valley Drive Bloomington, MN 55437**

Produced in the United States of America.

v.A

## Structured Abstract

**Clinical Question:** Do patients referred for telepractice swallowing therapy after a diagnosis of head and neck cancers (HNC) demonstrate improvement from baseline performance and/or comparable outcomes to in-person service delivery?

**Method:** Systematic Review

**Sources:** MEDLINE, PubMed, Google Scholar, the American Speech-Language and Hearing Association journals

**Search Terms:** dysphagia OR therapy OR rehabilitation OR intervention OR head AND neck OR cancer OR carcinoma OR telepractice OR telehealth OR telerehabilitation

**Number of Studies Included:** 6

**Primary Results:** Delivery of dysphagia therapy by telepractice for patients with HNC has been demonstrated to be feasible and cost-effective. Only one study showed clinical outcomes that were comparable to in-person treatment. The number of studies that employ clinical outcomes and comparison groups is limited.

**Conclusions:** The literature review for the effectiveness of telepractice delivery for the treatment of dysphagia secondary to HNC does not seem to provide strong evidence for comparable clinical outcomes. However, it does seem to be a cost-effective method. There is promise to better understand specific clinical outcomes using well-controlled randomized clinical trials.

# Telepractice Intervention for Dysphagia Secondary to Head and Neck Cancers

**Radish Kumar Balasubramaniam, PhD**  
**Kasturba Medical College**

**Vinaya Manchaiah, AuD, MBA, PhD**  
**Lamar University**

**Balaji Rangarathnam, PhD, CCC-SLP**  
**Midwestern University**

---

## Clinical Scenario

Elijah is a Speech-Language Pathologist (SLP) in Lincoln, Nebraska (NE). He works in a medical center that uses interdisciplinary practice in cancer treatment. His team had an opportunity to evaluate Rachel who was diagnosed with a Stage II carcinoma of the tongue. Rachel is a 70-year-old single woman who lives in the rural town of Mason City, NE. The nearest metropolitan area for Rachel is Lincoln and is located about 150 miles from Mason City. Rachel's team of oncology care determined that she needs an established protocol of radiation treatment (RT). Elijah performed baseline swallowing examinations in person at his place of employment in Lincoln before beginning RT. Rachel was recommended for prophylactic dysphagia therapy. Unfortunately, she may not be able to travel over 2.5 hours every week for her dysphagia care. She does not have a support system or access to care closer to home. The situation has negatively impacted her health and health-related quality of life (HRQoL) substantially. Elijah was interested in offering his services through telepractice; however, he had questions regarding the research evidence for dysphagia therapy outcomes for individuals with head and neck cancers (HNC) using telepractice.

## Background Information

In several clinical situations, patients who require speech/swallowing intervention secondary to a diagnosis of HNC often have to travel long distances to metropolitan areas with more advanced rehabilitation facilities. This is particularly relevant to predominantly rural areas and regions with significant limitations to access care.

Furthermore, situations related to infection control or immunocompromised states in scenarios such as the ongoing Coronavirus disease 2019 (COVID-19) pandemic present additional limitations related to access care. Challenges in traveling long distances limits participation in dysphagia therapy and negatively impacts treatment intensity and compliance, which are critical factors for positive rehabilitation outcomes (Burkhead et al., 2007).

Telepractice has been proposed as a service delivery model that can potentially supplement existing care to meet the needs of patients like Rachel. Although there has been a steady growth in how telepractice is used to treat communication disorders, its adoption has been rather slow. This may be due to a variety of reasons including limited academic training, lack of necessary equipment, and regulatory/reimbursement issues (Cherney & van Vuuren, 2012). Although the COVID-19 pandemic has enormous negative impact on all aspects of human life and has pushed healthcare service delivery to its limit (Blumenthal et al., 2020), unexpectedly, it seems to have accelerated the adoption and use of telepractice in communication disorders (Fong et al., 2021; Tohidast et al., 2020). This may be due to the desperation of professionals to adapt to the current service delivery needs as well as to the regulatory changes to licensing and reimbursement to ensure that telepractice is easy to use and offers essential services (Centers for Disease Control and Prevention, 2020). There is no doubt that telepractice has the potential to improve accessibility, affordability, and outcomes of health conditions (for review see Ward et al., 2017; Weidner & Lowman, 2020).

Treatment of dysphagia is particularly relevant because lack of accessible intervention could exacerbate pulmonary complications secondary to dysphagia and could

consequently result in a substantial negative impact on an individual's health. Understanding the utility of intervention administered via telepractice for patients closer to home would reduce healthcare burdens associated with limited access and could potentially improve HRQoL. However, it is important for healthcare professionals to consider the research evidence as well as potential challenges before adopting and implementing telepractice models for the treatment of any specific conditions. Elijah attempted to gather available evidence to understand the usefulness of administering therapy for dysphagia secondary to HNC via telepractice.

## Clinical Question

Elijah began his search for evidence by first defining a clinical question. He adopted the Population Intervention Comparison Outcome (PICO) criteria (Richardson et al., 1995) to frame his research questions.

Population: Individuals with HNCs

Intervention: Swallowing intervention via telepractice secondary to a diagnosis of HNC

Comparison: Outcomes of intervention delivered in person

Outcome: Changes in the subjective and objective swallowing measures and cost-effectiveness, patient satisfaction, or the feasibility

Elijah's initial search for studies provided minimal results because the search was limited to studies with a comparison group. He then expanded the search to include studies that had not necessarily used a comparison group of in-person intervention. He defined his clinical question as: Do patients referred for telepractice swallowing therapy after a diagnosis of HNC demonstrate improvement from baseline performance and/or comparable outcomes to in-person service delivery?

In addition to investigating the evidence for clinical outcomes of telepractice delivery, Elijah was also interested in understanding the steps to adopt telepractice by researching end-consumer variables such as feasibility, satisfaction, and the cost of care involved in telepractice for swallowing intervention in patients with HNC.

## Search for the Evidence

### Search Strategy

Elijah employed MEDLINE, PubMed, and Google Scholar databases to identify studies that have addressed telepractice for dysphagia therapy for patients with HNCs. His choice of key words included dysphagia OR therapy OR rehabilitation OR intervention OR head AND neck OR cancer OR carcinoma OR telepractice OR telehealth OR telerehabilitation. He sought to include studies in the last two decades (i.e., from the year 2000 to present). The search generated a total of 336 articles.

### Inclusion and Exclusion Criteria

Elijah chose to include studies that were reported in English. Studies that documented at least one therapy-related outcome related to telepractice were included. In addition to clinical outcomes, Elijah also included studies that helped him understand specifics of the usefulness of telepractice such as feasibility, patient adherence, compliance, and satisfaction.

Elijah included articles from three different telepractice models:

1. Clinician-directed synchronous intervention
2. Clinician-led intervention that the patient independently performs at a comfortable location
3. Patient-led intervention with support from the clinician as needed (including mobile phone applications)

After removing duplicates, the inclusion and exclusion criteria were applied to titles and abstracts of 336 articles; 302 articles were excluded. Full-text copies were obtained for the remaining 34 articles. Eventually, six studies were included in the review.

## Evaluating the Evidence

Elijah adopted the guidelines provided by the Oxford Centre for Evidence-Based Medicine (2009) to evaluate the strength of evidence obtained from the six articles. He provided the alphanumeric level of evidence for each of the six articles. He also described each of the PICO parameters addressed in the studies and presented them in a table (Table 1). In summary, three of the articles presented with a Level 2 evidence; however, only one article reported clinical outcomes related to telepractice delivery

of dysphagia therapy. A majority of the articles reported end user parameters such as cost effectiveness, satisfaction, and feasibility.

## Summary of Included Studies

Elijah first described the articles and presented them in a table (Table 2). In an earlier study, Burns and colleagues (2012) investigated the feasibility of providing telehealth SLP services (communication and swallowing) to a cohort of adult patients with HNC. Only five of the 18 participants received therapy for dysphagia. This pilot study demonstrated that *it is feasible* to provide therapy via a telepractice platform with clinicians and participants reporting high satisfaction. Continuing this line of work, Burns and colleagues also conducted a multisite randomized controlled trial for communication and swallowing impairments for patients with HNC (Burns et al., 2017). They included a comparison group that received in-person standard care. Of the 82 participants, seven received dysphagia care through telepractice, whereas six participants received in-person care. Similar outcomes were noted for both groups suggesting that telepractice interventions are equally effective when compared to in-person care.

Wall and colleagues (2017, 2019, 2020) reported outcomes related to a technology-assisted application called SwallowIT. The application provides an asynchronous platform for patients with instructional videos and monitors their performance. In a first study (Wall et al., 2017, the authors reported adherence to swallowing therapy protocols across three service delivery models (i.e., clinician-directed in-person therapy, technology-assisted therapy using SwallowIT, and independent patient-directed therapy). The first group received in-person delivery of the pharyngocise treatment protocol. A second group received the same protocol via SwallowIT, and a third group of participants was encouraged to practice these exercises independently at home. The pharyngocise protocol consisted of five exercises: sustained falsetto, tongue press, effortful swallow, the jaw stretch, and jaw strengthening using the Therabite® Jaw Motion Rehabilitation System™. Overall, the adherence after the 6 weeks in all groups were low (27%) and declined in weeks 4–6 of chemoradiation therapy. Because of this decline in weeks 4–6, the authors reported adherence to swallowing therapy across two time points: weeks 1–3 and weeks 4–6. The clinician-directed model yielded significantly better adherence than patient-directed therapy

in weeks 1–3. There was also a trend for higher adherence in the SwallowIT group compared to patient-directed in weeks 1–3. The authors also reported that adherence was comparable in the patient-directed group and the Swallow IT groups in both time periods. The authors did not report specific clinical outcomes in this study.

Subsequently, Wall et al. (2019) reported additional outcomes in the same group of participants. The authors reported results of an economic analysis in terms of costs involved from the perspective of the patient and health services in addition to HRQoL. The SwallowIT group demonstrated more cost-effective trends than the patient-directed model. Additionally, the SwallowIT group also provided clinically significantly superior HRQoL at the end of chemoradiation therapy for comparable costs. Furthermore, Wall et al. (2020) reported specific physiological swallowing measures utilizing the Modified Barium Swallow Impairment Profile (MBSImp) in the same set of participants. Although the outcomes related to the between group comparisons were comparable, participants did not improve on their overall MBSImp severity for oral and pharyngeal impairments in any of the groups. In fact, participants across groups demonstrated poorer outcomes after the prophylactic treatment during chemoradiation therapy. Overall, these studies suggest that better outcomes can be expected for modes that involve facilitation by a clinician or monitoring with technological applications compared to independent practice of exercises directed by patients themselves.

Collins et al. (2017) investigated the feasibility of a home-based telehealth model for conducting speech-language pathology and nutrition reviews post chemoradiation for 30 patients with HNC. Fifteen of these patients received in-person care whereas another 15 received care via telepractice. The outcomes evaluated were the service delivery, costs, and patient satisfaction. The authors reported that the telepractice group performed better, and with more efficiency, with reduced number and duration of appointments required until discharge and reported increased satisfaction with telehealth services. Significant savings were reported for the telepractice group because of the reduced travel requirements.

## The Evidence-Based Decision

Elijah's review of the available evidence for telepractice intervention for dysphagia secondary to HNC appeared to

be in very initial phases. Elijah was able to determine that telepractice is a *feasible and cost-effective method* to deliver his therapeutic services. These results are consistent with some recent systematic review in this area (Larson et al., 2019; Ward et al., 2017). However, the specific effects of therapeutic interventions themselves via telepractice have not been established. Despite these disconcerting pieces of evidence, the evidence seems to point to the potential of telepractice in improving accessibility, affordability, and outcomes of patients with HNC seeking dysphagia interventions. In particular, studies suggested that telepractice models with clinician assistance seem to have higher adherence and more favorable outcomes than patient-directed (i.e., self-management) models (e.g., Ward et al., 2017). These findings are consistent with literature from other health areas which have highlighted the importance of guidance when offering telepractice interventions (Baumeister et al., 2014). Considering these, Elijah decided to provide care from a remote setting in his workplace in Lincoln while Rachel participated from her home in Mason City.

Elijah's decision was based on several factors. SLPs often face the challenge of providing flexible services to meet the complex communication and swallowing needs of patients. Telepractice offers the potential to extend clinical services to remote, rural, and underserved populations. A true evidence-based practice model incorporates research evidence, clinical expertise, and patient values. Even though research evidence for specific treatment-related outcomes was limited, Elijah utilized strengths from his clinical expertise and specific needs for Rachel. *Contrary to misconceptions, telepractice is only an alternative mode of service delivery and not a different therapy method by itself.* Evidence from Wall et al. (2017) provided insights about the usefulness of clinician-directed therapy. As such, therapy provided and led by a clinician, albeit remotely, could potentially offer positive outcomes. Lack of access to care for Rachel could potentially lead to further deconditioning and exacerbate the negative outcomes related to nutrition and hydration. However, clearly this review points to the need for more research in this area to develop a strong evidence base as well as clinical training to ensure that SLPs are aware of the potential and pitfalls of evidence-based service delivery models (Murray, 2012).

## Authors' Note

**Radish Kumar Balasubramaniam**, PhD, is a professor and head of the Department of Audiology and Speech-Language Pathology at Kasturba Medical College, Manipal Academy of Higher Education, Mangalore, India. His research interests relate to the disorders of voice and swallowing.

**Vinaya Manchaiah**, AuD, MBA, PhD, is a Jo Mayo endowed professor of speech and hearing sciences in the Department of Speech-Language and Hearing Sciences at Lamar University, Beaumont, Texas. His research focuses on improving accessibility, affordability, and outcomes of hearing healthcare services by promoting self-management and using digital technologies.

**Balaji Rangarathnam**, PhD, is an associate professor in the Department of Speech-Language Pathology at Midwestern University, Downers Grove, Illinois. His scholarly interests relate to the disorders of voice and swallowing.

### Address for Correspondence:

Balaji Rangarathnam, PhD  
Department of Speech-Language Pathology  
Midwestern University  
Alumni Hall 209-G  
555 31st Street  
Downers Grove, IL  
brangara@fiu.edu

## References

- Baumeister, H., Reichler, L., Munzinger, M., & Lin, J. (2014). The impact of guidance on internet-based mental health interventions—A systematic review. *Internet Interventions, 1*(4), 205–215. <https://doi.org/10.1016/j.invent.2014.08.003>
- Blumenthal, D., Fowler, E. J., Abrams, M., & Collins, S. R. (2020). Covid-19—Implications for the health care system. *The New England Journal of Medicine, 383*(15), 1483–1488. <https://doi.org/10.1056/NEJMs2021088>
- Burkhead, L. M., Sapienza, C. M., & Rosenbek, J. C. (2007). Strength-training exercise in dysphagia rehabilitation: Principles, procedures, and directions for future research. *Dysphagia, 22*(3), 251–265. <https://doi.org/10.1007/s00455-006-9074-z>

- Burns, C. L., Ward, E. C., Hill, A. J., Kularatna, S., Byrnes, J., & Kenny, L. M. (2017). Randomized controlled trial of a multisite speech pathology telepractice service providing swallowing and communication intervention to patients with head and neck cancer: Evaluation of service outcomes. *Head & Neck, 39*(5), 932–939. <https://doi.org/10.1002/hed.24706>
- Burns, C. L., Ward, E. C., Hill, A. J., Malcolme, K., Bassett, L., Kenny, L. M., & Greenup, P. (2012). A pilot trial of a speech pathology telehealth service for head and neck cancer patients. *Journal of Telemedicine and Telecare, 18*(8), 443–446. <https://doi.org/10.1258/jtt.2012.gth104>
- Centers for Disease Control and Prevention. (2020). *Using telehealth to expand access to essential health services during the COVID-19 pandemic*. <https://www.cdc.gov/coronavirus/2019-ncov/hcp/telehealth.html>
- Cherney, L. R., & van Vuuren, S. (2012). Telerehabilitation, virtual therapists, and acquired neurologic speech and language disorders. *Seminars in Speech and Language, 33*(3), 243–258. <https://doi.org/10.1055/s-0032-1320044>
- Collins, A., Burns, C. L., Ward, E. C., Comans, T., Blake, C., Kenny, L., Greenup, P., & Best, D. (2017). Home-based telehealth service for swallowing and nutrition management following head and neck cancer treatment. *Journal of Telemedicine and Telecare, 23*(10), 866–872. <https://doi.org/10.1177/1357633X17733020>
- Fong, R., Tsai, C. F., & Yiu, O. Y. (2021). The implementation of telepractice in speech language pathology in Hong Kong during the COVID-19 pandemic. *Telemedicine and e-Health, 27*(1), 30–38. <https://doi.org/10.1089/tmj.2020.0223>
- Larson, J. L., Rosen, A. B., & Wilson, F. A. (2018). The effect of telehealth interventions on quality of life of cancer patients: A systematic review and meta-analysis. *Telemedicine and e-Health, 24*(6), 397–405. <https://doi.org/10.1089/tmj.2017.0112>
- Murray, E. (2012). Web-based interventions for behavior change and self-management: Potential, pitfalls, and progress. *Medicine 2.0, 1*(2), e3. <https://doi.org/10.2196/med20.1741>
- Oxford Centre for Evidence-Based Medicine. (2009). *Oxford Centre for Evidence-Based Medicine: Levels of Evidence (March 2009)*. <https://www.cebm.ox.ac.uk/resources/levels-of-evidence/oxford-centre-for-evidence-based-medicine-levels-of-evidence-march-2009>
- Richardson, W. S., Wilson, M. C., Nishikawa, J., & Hayward, R. S. A. (1995). The well-built clinical question: A key to evidence-based decisions [Editorial]. *ACP Journal Club, 123*(3), A12. <https://doi.org/10.7326/ACPJC-1995-123-3-A12>
- Tohidast, S. A., Mansuri, B., Bagheri, R., & Azimi, H. (2020). Provision of speech-language pathology services for the treatment of speech and language disorders in children during the COVID-19 pandemic: Problems, concerns, and solutions. *International Journal of Pediatric Otorhinolaryngology, 138*, 110262. <https://doi.org/10.1016/j.ijporl.2020.110262>
- Wall, L. R., Kularatna, S., Ward, E. C., Cartmill, B., Hill, A. J., Isenring, E., Byrnes, J., & Porceddu, S. V. (2019). Economic analysis of a three-arm RCT exploring the delivery of intensive, prophylactic swallowing therapy to patients with head and neck cancer during (chemo)radiotherapy. *Dysphagia, 34*(5), 627–639. <https://doi.org/10.1007/s00455-018-9960-1>
- Wall, L. R., Ward, E. C., Cartmill, B., Hill, A. J., Isenring, E., Byrnes, J., & Porceddu, S. V. (2020). Prophylactic swallowing therapy for patients with head and neck cancer: A three-arm randomized parallel-group trial. *Head & Neck, 42*(5), 873–885. <https://doi.org/10.1002/hed.26060>
- Wall, L. R., Ward, E. C., Cartmill, B., Hill, A. J., & Porceddu, S. V. (2017). Adherence to a prophylactic swallowing therapy program during (chemo) radiotherapy: Impact of service-delivery model and patient factors. *Dysphagia, 32*(2), 279–292. <https://doi.org/10.1007/s00455-016-9757-z>
- Ward, E. C., Wall, L. R., Burns, C. L., Cartmill, B., & Hill, A. J. (2017). Application of telepractice for head and neck cancer management: A review of speech language pathology service models. *Current Opinion in Otolaryngology & Head and Neck Surgery, 25*(3), 169–174. <https://doi.org/10.1097/MOO.0000000000000357>
- Weidner, K., & Lowman, J. (2020). Telepractice for adult speech-language pathology services: A systematic review. *Perspectives of the ASHA Special Interest Groups, 5*(1), 326–338. [https://doi.org/10.1044/2019\\_PERSP-19-00146](https://doi.org/10.1044/2019_PERSP-19-00146)



**Table 1. Description of the Studies Based on the PICO Model and Levels of Evidence**

Study	Population (P)	Intervention (I)	Comparison (C)	Outcomes (O)	OCEBM level of evidence
Burns et al. (2012)	X	X	None	*	Level 4
Wall et al. (2017)	X	X	X	*	Level 2
Burns et al. (2017)	X	X	X	*	Level 3
Collins et al. (2017)	X	X	X	*	Level 3
Wall et al. (2019)	X	X	X	*	Level 2
Wall et al. (2020)	X	X	X	X	Level 2

\* These articles reported associated variables, such as feasibility and adherence, rather than specific clinical outcomes.

**Table 2. Summary of the Reported Articles**

Study	Objective	Salient findings
Burns et al. (2012)	Determine feasibility of providing telehealth SLP services (communication and swallowing) to a cohort of adult patients with HNC.	The study included treatment for speech and swallowing; five participants received treatment for dysphagia. This pilot study demonstrated high satisfaction of both patients and clinicians with telepractice.
Wall et al. (2017)	Determine adherence to swallowing therapy protocols across three service-delivery models (i.e., clinician-directed in-person therapy, technology-assisted therapy using SwallowIT, and independent patient-directed therapy).	Adherence was better for the clinical-directed model followed by the SwallowIT technology assisted therapy in comparison to self-directed patient management.
Burns et al. (2017)	Compare speech and swallowing outcomes with respect to satisfaction and number of contact events in a large cohort of HNC patients, some of whom received care via telepractice.	Higher “service efficiency” was reported for telepractice care with high clinician and participant satisfaction.
Collins et al. (2017)	Determine the feasibility of a home-based telehealth model for conducting speech-language pathology and nutrition reviews post chemoradiation for patients with HNC.	The telepractice group demonstrated higher efficiency with reduced number and duration of appointments required until discharge and reported increased satisfaction.
Wall et al. (2019)	Determine economic parameters related to costs involved in three service delivery models (i.e., clinician-directed in-person therapy, technology-assisted therapy using SwallowIT, and independent patient-directed therapy).	The technology-assisted SwallowIT offered most cost-effective outcomes compared to the other two groups of participants.
Wall et al. (2020)	Determine oral and pharyngeal dysphagia severity in three service delivery models (i.e., clinician-directed in-person therapy, technology-assisted therapy using SwallowIT, and independent patient-directed therapy).	Participants did not improve on their overall MBSImP severity for oral and pharyngeal impairments in any of the groups. Participants across groups demonstrated poorer outcomes after the prophylactic treatment during chemoradiation therapy.