Clinical Swallowing Evaluations via Telehealth: A Scoping Review & Ideas for Implementation

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SLIDE: CLINICAL SWALLOWING EVALUATIONS VIA TELEHEALTH: A SCOPING REVIEW & IDEAS FOR IMPLEMENTATION

Hi, my name is Stephanie Merrill and this is my presentation on clinical swallowing evaluations via telehealth.

SLIDE: PURPOSE

The purpose of this project was to complete a scoping literature review on possible procedures for completing Clinical Swallowing Assessments via telehealth and to develop and implement procedures for clinical swallowing evaluations completed via telehealth for patients seen in ALS clinic. Clinical swallowing evaluations includes records review, interview, oral mechanism exam, and observation with food/liquid as tolerated by the patient. Typically, clinical swallowing evaluations are completed with patients in person, however, with COVID-19, many clinics temporarily closed and we all had to dive head-long into figuring out how to do this virtually!

SLIDE: SCOPING REVIEW SEARCH TERMS

So, to begin, we laid out our search terms for finding literature, including clinical swallowing evaluation, telehealth, and assessment.

SLIDE: CRITERIA FOR LITERATURE SEARCH

Then we formed inclusion and exclusion criteria. Originally, we wanted to include articles for adult populations, that reviewed swallowing assessment components via telemedicine and were conducted to the patient's home. But…

SLIDE: LITERATURE REVIEW FLOW CHART

When screening articles with our original inclusion and exclusion criteria, we actually found that there was only one article that met all of our criteria and that one was really recent, only having come out in 2021. Because of this, we decided to take out the criteria of "Telemedicine directly to patient's home" and look at articles based on whether they conducted clinical assessment of swallowing via telehealth at all. Other than the first article we identified, there were 9 additional articles that met all the new, so we decided to take a look at those with 10 total articles. Ultimately, we noticed a pattern within the majority of the articles that we were reviewing. When conducting clinical swallowing evaluations, they were all citing two articles (Sharma et al, 2011, AND Ward, et al, 2012), so we decided to take a better look at those articles in this review in addition to the one article that we found that met our original criteria (Borders, et al, 2021).

SLIDE: GAPS IN RESEARCH

Much of the research was conducted under very well-controlled research conditions, which is great for getting results, but much of the set-up would be difficult, if not impossible for real-life clinicians to implement. These conditions include that the patients were actually present at the same facility as the clinician, simply in separate rooms. They had a trained facilitator in the room with them to relay information to the clinician and assist the patient as needed. They used prescribed technology in the sessions, like a customized video conferencing software, prescribed internet speeds, external lighting, zoom cameras, etc. Another gap in the research specific to this topic is the lack of research specifically

focused on telehealth assessment of swallowing for people with ALS. Since progressive neurological disorders like this can affect the patient's ability to move, this could affect their ability to properly participant in a telehealth assessment.

SLIDE: LITERATURE REVIEW

So far, studies have been showing that clinical swallowing evaluations via telehealth are feasible and can provide reliable and valid outcomes, which are comparable to in-person assessments of swallowing. However, as I mentioned, majority of the articles we found based their telehealth swallowing assessment protocols on the system and procedures of two of the articles we did scoping reviews on, Sharma et al. 2011 and Ward et al 2012. These articles were conducted by the same authors (Sharma, Ward, Burns, Theodoros, and Russell). In the original article, Sharma et al 2011, they give a general outline of their protocol and conduct their assessment using simulated patients. In the Ward et al. 2012 article, the authors flesh out the original protocol even more and conduct assessment with real patients with normal to mild cognitive impairment.

SLIDE: LITERATURE REVIEW SHARMA ET AL 2011 and WARD ET AL 2012 CSE PROTOCOL

So this is the protocol overview that Ward et al and Sharma et al laid out in their studies. It contained 65 items categorized into 4 sections. Sharma et al 2011 found high to excellent levels of agreement between telehealth and in person speech pathologists across all parameters of their clinical swallowing evaluations and excellent agreement for aspiration risk. Ward et al 2012 found that telehealth clinical swallowing evaluations provided valid and reliable outcomes comparable to clinical decisions made in in-person assessments.

SLIDE: FRITZ ET AL 2020 TELEMEDICINE FLOWCHART

We also reviewed Fritz et al.'s expert review, which discusses dysphagia care and assessment in the context of COVID-19. While this article did not focus primarily on the clinical swallowing examination, it laid out this alternative flowchart for conducting swallowing assessments in the context of COVID. In reviewing this article, we got the idea for including aspects of the Yale Swallow Study into our protocol recommendations, specifically the cognitive-linguistic screen and the 3-ounce water swallow test

SLIDE: BORDERS ET AL 2021

Borders, et al. 2021 was the one article that we found that fit all of our original inclusion criteria and addressed some of the gaps that we were finding in all of the other research regarding conducting clinical swallowing evaluations via telehealth. They conducted swallowing assessments in patients with movement disorders, specifically Parkinson's, Lewy body dementia, multiple systems atrophy, and Type 3 spinocerebellar ataxia, though not ALS. They made sure the patient was in their own home, had no previous assessment training, was using their own devices and technology. Borders et al also used a different protocol than the Sharma and Ward articles, which additionally set them apart from the majority of the research we found. They're protocol included a case history, cognitive screen, cranial nerve assessment, although, they provided no details regarding what their cranial nerve assessment entailed, a swallowing related QOL questionnaire, observations of oral intake, and two objective clinical measure of swallowing called the Timed Water Swallow Test (TWST) and the Test of Masticating and

Swallowing Solids (TOMASS) In the TWST, the patient drink 100-150 ml of water as fast as they comfortably can while the clinician records the time, volume and number of swallows taken to consume the liquid. The TOMASS attempts to quantify oral efficiency by recording a number of variables such as the number of bites they take and the time it takes them to consume a solid bolus. To prepare for the appointment, patients were sent instructions to use a device with a camera in a private room at home and be seated in an upright position that provided visualization of their face and upper body. They were required to have a glass, measuring cup, and cracker available (preferably a saltine) and to have a caregiver/facilitator present in the household for assistance as needed.

SLIDE: ADAPTING PROTOCOLS – IDEAS FOR CSE VIA TELEHEALTH

We are wanting to adapt the telehealth swallowing assessment protocols in the context of ALS population; however, it should be noted that our literature did not focus on ALS and, in fact, there is no literature that focuses on the ALS population for telehealth assessments. Based on the literature that we did review; this is the procedure that we came up with. Since we would be conducting these assessments in a real-world scenario, we would send out instructions to the patient prior to their appointment, so they are prepared. Additionally, though there is no research on conducting the EAT-10 virtually with people who have ALS, in 2016, Plowman, et al. demonstrated that this self-reported scale differentiated safe vs unsafe swallowing in patients with ALS, so we felt that it was an important tool to include. Following this, we have the brief cognitive screen from the Yale Swallow Protocol, which includes making sure the patient is oriented to person, place, and the date. Then the oral mechanism exam, which looks at the patients' cranial nerves and also helps determine if they are able to adequately follow single step commands. Lastly, the clinical assessment of swallow function, which can include either observation of PO trials or potentially the TWST and TOMASS.

SLIDE: PATIENT INSTRUCTIONS

So, the first thing we do once the patient is scheduled is to send out instructions to that they know how to prepare for the assessment, including what to expect, materials they will need to have available, and making sure to have a caregiver/facilitator nearby and available for assistance, if needed. We felt that this was important specifically for the ALS population, as many people may have progressed to the point that they are unable to adequately reposition their computer or feed themselves, so assistance is required.

SLIDE: CLINICAL SWALLOWING EVALUATION: PATIENT INTERVIEW

During the actual assessment, we will start with a patient interview, going over information like their primary swallowing concerns and symptoms, previous treatment, dietary status, respiratory status, like if they are on noninvasive ventilation, and the patient's self-ratings on the ALS Functional Rating Scale (ALSFRS), which has subsections that address pertinent information like speech, swallowing, and saliva management.

SLIDE: CSE: ORAL MECH EXAM

We based our oral mechanism examination on the protocols in the Sharma et al. and Ward et al. articles, and adapted them for real life telehealth assessment, with the patient in their own home, using their own equipment. Adaptions to the protocol was necessary because there are some actions that we normally ask the patient to do that are difficult or impossible to visualize over the screen. For example, asking a patient to say, "ahh" while looking in their mouth and trying to see if their soft palate/uvula raise with voicing. It is almost impossible to see to the back of the patient's mouth on screen. Alternatively, while observing lingual/lip strength, we can ask the patient to puff their cheeks out with air, and though we cannot press on the cheeks to see if the patient is able to keep any air from escaping, we CAN visualize if they are able to trap air or not and make a visual inference.

SLIDE: CSE: CLINICAL ASSESSMENT OF SWALLOWING FUNCTION

For the clinical assessment of swallowing function, the clinician can either using the observation of PO trials conducted during a clinical swallowing evaluation or the TWST and TOMASS. Realistically, completing both of these activities, like Borders et al. did, would take too long to conduct in a real-life telehealth appointment, so the clinician would need to choose one or that other. Considerations could include whether the clinician is comfortable taking the required data down for the TWST and TOMASS. The upside to this choice would be that it would provide objective outcomes and the clinician could compare their patient's data to normative data in healthy adults. Theoretically, in the context of the ALS population, this could provide progressive objective data to compare the patient's own numbers against, as they progress in their disease. The PO trials, or taking food/liquid through the mouth, would consist of placing the patient lateral to the camera, so that the clinician can see if there is laryngeal elevation during the swallow, The trials would consist of 1 sip of liquid from a cup, while monitoring the number of swallows it takes them to complete the sip – in healthy adults, one sip should be completed in one swallow. Next, if tolerated, the patient would take sequential sips of 3ounces liquid from the cup or from a straw, per the Yale Swallow Protocol. After the liquid trials, the patient should take 1 tsp of puree and then 1 bite of a solid, like a cracker. Following each of the trials, the clinician will watch for overt signs of aspiration, which is when food or liquid going into the airway, and they will also check for residue in the oral cavity after solid foods.

SLIDE: CONCLUSIONS

Preliminary studies have suggested procedures for completing clinical swallowing evaluations via telehealth. Though there is the caveat that only one study has actually examined virtual clinical swallowing evaluations that were completed from the patient's homes in more real-life situations. Additionally, more research is needed to establish valid procedures for virtual clinical swallowing evaluations in people with neurological impairments, such as ALS