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Enhancing Staff Safety in Swallowing Assessment: Insights Post COVID Pandemic

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Abstract

The COVID-19 pandemic was a time of significant challenge in the healthcare industry. In particular, hospitals worked diligently to develop protocols and guidelines to reduce viral transmission to both patients and staff. Service delivery concerning the instrumental assessment of swallowing evaluation was particularly challenging during the pandemic given the high risk of viral transmission to clinical staff. Clinical algorithms were developed with the goal of implementing a measured return to service delivery while preserving the clinical workforce. The conceptual development and evolution of the algorithms are discussed to highlight knowledge gained from the COVID-19 pandemic with the objective of assisting other professionals who perform essential functions in ensuring their safety and mitigating virus transmission. Should another healthcare crisis arise, insights from this experience can inform other institutions who want to prioritize both preservation of workforce and delivery of evidence-based care.

Keywords: COVID-19, Swallowing assessment, Safety, Algorithm, Staff

Introduction

The COVID-19 pandemic was one of the most challenging healthcare crises of this century. Research and healthcare delivery systems worldwide delegated all available resources to decreasing morbidity and mortality for those patients infected with severe acute respiratory syndrome coronavirus 2 (SARSCoV-2). Equally as important during this time was ensuring the safety and preservation of the workforce caring for patients with COVID-19. Hospitals and healthcare facilities worked to develop protocols and guidelines to reduce viral transmission to other patients and staff. Universally, healthcare policies and practices dictated the use of a N-95 respirator for staff in direct contact with infected patients. Additionally, the use of long sleeve, waterproof gowns, powered air-purifying respirators, and face shields/visors were also reported [1]. Investigations published during the pandemic also highlighted guidelines for pre-shift clothing, identification badges, non-essential wear, facial hair, and cell phones, as well as procedures for donning and doffing personal protective equipment (PPE) [2].

SARSCoV-2 is transmitted primarily through droplets; however, airborne transmission can also contribute to viral spread. The highest viral load is in the upper digestive tract, specifically in the mucosa of the nose, oral cavity, and pharynx, making transmission a significant concern for those procedures involving the airway. The concern for viral transmission in general, and more specifically in the context of procedures involving the airway, shifted clinical practice significantly during the pandemic. Givi *et al.* [3] proposed broad guidelines for staff in the context of service delivery by otolaryngology, reporting that preservation of the healthcare workforce is of the utmost importance during a global health crisis. Workflows for operative, office, and diagnostic procedures were highlighted, and PPE, clinician experience, team size, use of technology to improve social distancing, disposable equipment options, as well as prioritization and timing of procedures as related to viral load were reviewed.

Protecting both patients and staff during the COVID-19 pandemic was a critical service delivery issue for speech-language pathologists (SLPs) as they provide services in swallowing assessment. Objective measures for instrumental swallowing assessment include Fiberoptic Endoscopic Evaluation of Swallowing (FEES) and Modified Barium Swallow (MBS). Both assessments require the SLP to be near the patient, do not allow for mask-wearing by the patient given the need for food trials, and are likely to produce cough [4]. These factors place SLPs at high risk for transmission of COVID-19 during the assessment of swallowing. Additionally, FEES places the SLP at even greater risk due to the nature of the endoscopic procedure. Current literature does not demonstrate a consensus on whether endoscopy is an aerosol generating procedure (AGP) [5]; however, the literature does support the fact that performing FEES procedures puts clinicians at risk for transmission of COVID-19 [6-8].

Administrative concerns during this time were focused on both patient and staff safety. In a consultative role, SLPs in the medical setting have a relatively small, but critical, workforce. Service delivery in speech-language pathology varied widely during the pandemic. Some institutions chose a more conservative approach from a staff safety perspective and largely abandoned instrumental assessments to preserve their workforce. While effective from a staffing perspective, this left patients at a clinical disadvantage as instrumental swallowing evaluations are the gold standard for swallowing assessment. These practice patterns, when considered from a patient care perspective, raised ethical concerns as, at many facilities, implementing measures to protect staff resulted in the withholding of established evidence-based practice for patients.

Our large, urban, tertiary care center took a more liberal approach that was based on the available science of viral transmission and intentionally evolved over time in a way that both allowed our center to provide the best possible care to patients while preserving our workforce. Previously published results indicated that during the 19 months of the COVID-19 pandemic, our healthcare center completed 4,482 FEES evaluations and 758 MBS evaluations. During this time, no workplace COVID-19 transmission was reported [9]. Early advocacy, interdisciplinary collaboration, and development of clinical algorithms were critical to our success. Though most people remain optimistic that the most challenging phase of the pandemic is behind us, lessons learned during this critical period can serve as foundational information for future planning in infectious disease crises. The purpose of this commentary is to highlight insights gained from the COVID-19 pandemic with the objective of assisting other professionals who perform essential functions in ensuring their safety and mitigating virus transmission.

COVID-19 Algorithms

In the early stages of the pandemic, little was known about the mechanism of transmission of the SARSCoV-2 virus. Speech-language pathology leadership collaborated with infection prevention, leadership in otolaryngology and radiology, central reprocessing, and systemwide medical leadership to determine the optimal service delivery framework to both ensure evidence-based care as well as prioritize staff safety. This coordinated approach facilitated collective problem solving and enabled the team to comprehensively address patient and staff safety concerns, adhere to best clinical practice, and prioritize the mitigation of transmission rates.

Concept

Speech-language pathology is an essential service within every healthcare system, diagnosing and rehabilitating those individuals across the lifespan with difficulty swallowing, communication impairments, and voice disorders. COVID-19 was impacting breathing, swallowing, the ability to phonate, and cognitive functioning in those patients suffering from the virus. Evaluating and treating these diagnoses place healthcare providers at high risk for viral transmission as they often involve AGPs. During the pandemic, leadership was highly focused on the available science regarding AGPs given the nature of the interactions that SLPs and otolaryngologists have with patients. Per the Centers for Disease Control (CDC), AGPs are medical procedures that are, "more likely to generate higher concentrations of infectious respiratory aerosols than coughing, sneezing, talking, or breathing" [10].

Based upon early research from outside the US, otolaryngologists were reportedly dying at a higher rate versus other specialists, likely secondary to engagement in AGPs, high viral load of the virus in the nares where endoscopy procedures are targeted, and lack of PPE [11]. At our facility, concern regarding SLP services was high given the similarity in procedures to those of otolaryngology. Initially and in alignment with otolaryngology, a conservative approach to SLP service delivery was established until more was known about the nature of the virus. SLP services were largely placed on hold as leadership monitored ongoing research and advocated early and vigilantly for access to PPE for all SLPs across the healthcare system. Hospital-wide infection control policies were in place for all staff; however, speech-language pathology administration felt the need to identify departmental workflows and procedures that would further specify changes to clinical workflow in the context of the pandemic.

Algorithms were identified early as a tool to establish a consistent clinical approach, provide staff education, to increase efficient service provision and ensure an appropriate use of resources. The goal in establishing a SLP specific

algorithm was to move toward a measured return to service delivery while preserving the safety of the team. The initial algorithm was established in April 2020 in collaboration with otolaryngology, radiology, and infectious disease and incorporated the known science at that time on transmission of the COVID-19 virus [9]. The algorithm was then adopted across the healthcare system.

Clinical aims

Ensuring the continuity and consistency of SLP services was critically important during a time of uncertainty in healthcare. An algorithm served as a decision tree that was grounded in evidence, supported by administration, and allowed consistent service provision across clinicians. The algorithm was established as a living document and served as an effective and efficient instrument for communication as the science of the virus evolved. One of the earliest goals of the algorithm was preservation of clinical workforce. As is the case with most large tertiary healthcare systems, the SLP team was small in comparison to nursing resources, therefore the temporary loss of even one staff member would significantly impact service delivery.

Another aim of the algorithm was to empower staff with a tool for clinical decision making and clinical prioritization. Routine services thought to be of low priority, such as utilization of repeat instrumentals for diet upgrades, were deprioritized for those patients awaiting instrumental assessments that would be more impactful to outcomes, such as a patient who was nil per os (NPO) awaiting discharge. The algorithm served as a guiding document for SLPs, assisting in both developing a clinical plan as well as in their communication with the care team.

Transparency of SLP clinical decision making with allied healthcare colleagues was a critical function of the algorithm. Providers and nursing staff were managing high volumes of COVID-19 positive patients. Typically robust SLP service provision was heavily impacted due to the nature of the virus. Our large tertiary care center employs thousands of medical personnel. This staff grew exponentially during the pandemic to include travelers to fill the gaps in resources. The algorithm served as an excellent communicative tool among colleagues, as SLPs did not have the bandwidth to educate all nurses and providers on the changes to our service provision during the pandemic.

While the initial goals of the algorithm were to keep staff safe while providing the most critical services to patients, it ultimately provided a pathway for a return to instrumental assessments in May of 2020. Instrumental assessments, like FEES and MBS, were thought to be amongst those SLP procedures with the highest risk of COVID-19 exposure and transmission due to the high viral load in the nares, respiratory, and upper digestive tract. At our facility, staff performed, on average, 35 FEES and 10 MBS per day. The inability to provide these services during the early days of the pandemic were not consistent with the established best practices for our field, as instrumental assessments are the gold standard for the evaluation of dysphagia. The algorithm, in combination with the SLP procedures, PPE guidelines, and equipment disinfection policies, led the team back to instrumental service provision, kept them safe from the COVID-19 virus, and supported the return to evidence-based practices [9].

Algorithm content

The initial algorithm reflected three decision trees to rule out COVID-19, one for a patient whose COVID-19 test results were in progress, one for the known COVID-19 positive patient based upon positive test results, and one for the asymptomatic patient [9]. A supportive document was also drafted outlining the provision of services by SLPs and recommended PPE for each SLP procedure.

In all three pathways on the algorithm, SLPs engaged in traditional clinical activities such as medical record review and consultation with the care team. Pathways for initial care activities varied and were dictated by COVID-19 status, clinical prioritization, and relative risk of required clinical activity. Early on, administrative approval for instrumental swallowing evaluations was required. Themes included in each pathway were required PPE, cluster care, monitoring of symptoms, timing of clinical activities, and appropriate interdisciplinary plan of care based on the above parameters.

Algorithm evolution

SLP service provision and the algorithm evolved in tandem with science. Milestones that were impactful to clinical workflow and evolution of the algorithm included progress with COVID-19 testing, the refinement of COVID positive criteria to better reflect those who were contagious, the addition of high-risk procedure criteria, and the elimination of administrative approval for instrumental assessments. These changes collectively reinstated staff autonomy with clinical decision making and improved timely delivery of care. **Table 1** highlights key changes in the evolution of the algorithm over time.

At the start of the pandemic, COVID testing was not yet widespread. Early studies showed that up to 39.7% of those who were COVID positive were asymptomatic [12]. Little was known about optimal timing for testing, infectious timeframe, or immunity once infected. These uncertainties contributed to a conservative approach to care delivery in treating all patients as though they were COVID positive. The American Speech-Language Hearing Association (ASHA), Speech Pathology Australia, and the Dysphagia Research Society (DRS), as governing professional organizations, were in support of this practice [13-15].

Table 1. Summary of clinical workflow algorithm key changes over time.

Clinical Parameter	**Pre-Pandemic**	**Initial Clinical Workflow of Study Period** **Algorithm A**	**Final Clinical Workflow of Study Period** **Algorithm B**	**Post Pandemic** **(Current state)**
Administrator approval required prior to FEES	No	Yes	No	No
Pre-procedural testing required prior to FEES	No	Yes	No	No
Required PPE during FEES procedure*	Gloves	N-95 Mask Gloves Gown Face shield/eye protection Head covering Foot covering	N-95 Mask Gloves Gown Face shield/eye protection	Surgical Mask Gloves Gown N-95 Mask** Face shield/eye protection**

*Standard patient without known infectious disease processes that require additional PPE.
**Known COVID positive patient.

As COVID tests became more reliable and accessible, pre-procedural testing was established prior to instrumental assessment by SLPs. Initially, evidence of a negative PCR test result within 48 hours was established prior to high-risk procedures, which was in alignment with practices in otolaryngology. Further evolution of the algorithm developed based upon guidance around high-risk versus low-risk procedures. The timeline for negative test results slowly expanded to 72 hours. In May of 2021, pre-procedural testing was eliminated given the high vaccination rates, reduced volumes of COVID positive inpatients, availability and access to PPE, cost of testing, and delays in service delivery waiting for results. Also at this time, administrative approval was eliminated for instrumental procedures. As science evolved, every effort was made to maximize the autonomy of the SLP staff with clinical decision making and eliminate any delays to the delivery of care while ensuring the safety of the SLP team.

Criteria for classifying urgent consults were clarified and communicated with staff as the pandemic progressed and clinical autonomy began to resume. Specific parameters for consult urgency were developed. For example, urgent or emergent swallow consults included patients who were NPO with or without alternate means of nutrition or patients who were awaiting a discharge dependent swallow study. Examples of non-urgent consults included patients with percutaneous gastrostomy tubes, patients with chronic dysphagia on a modified diet prior to admission, patients tolerating current oral diets, patients with a history of non-compliance to recommendations, and patients who were comfort measures only. Additionally, repeat instrumental swallowing assessment criteria were also established which included significant improvements in clinical status (e.g., mental status, strength and conditioning, or respiratory status, discharge dependency, change in status, or poor tolerance to recommended diet). These criteria were established to limit exposure of staff to the virus and to ensure service delivery to those with the greatest clinical need.

Swallowing screening workflow also evolved as the pandemic progressed. Pre-pandemic workflow included an aspiration risk screen by nursing. If the patient failed, a speech consult was placed, and an instrumental evaluation would be performed. During the pandemic, non-urgent patients who failed the screen were re-screened by nursing at a regular cadence. After multiple failures of the screening protocol, a FEES was conducted by SLP.

The algorithm that was in place toward the end of the pandemic in November 2021 reflected changes to include the delineation of COVID-19 positive patients and risk for transmission based upon severity and duration of symptoms. These changes were made with hospital wide infectious disease guidance and with approval of medical leadership. As the impact of COVID-19 on hospitalized patients lessened over time given high vaccination rates and reduced volumes of COVID-19 positive inpatients, the algorithms were no longer needed. Current service delivery is like that of pre-pandemic workflow. Clinical autonomy has been reinstated and evidence-based workflow for instrumental assessment has fully resumed. Patients who are COVID positive receive the same clinical care as those who are not. The two residual

changes from the pandemic are related to PPE and equipment. N95 masks are worn with all COVID-positive patients and surgical masks are worn for asymptomatic patients. Equipment disinfection policies created during the pandemic remain in place.

Ethical considerations

The pandemic shifted models of healthcare delivery across the medical field and the initial shift away from instrumentation in an effort to preserve our workforce was no exception. The decision to work to protect staff through the use of algorithms was two-fold, to both protect staff and work to provide services to those who needed them most. The development of these protocols were thoughtful and deliberate, weighing all ethical considerations.

Ethical deliberations on algorithm establishment were challenging as it was necessary to consider the best interest of the patient from two different perspectives. One consideration was the delivery of best practice to an individual patient at the bedside. The other involved considering care delivery more holistically in that not having enough staff to provide services would be detrimental to all patients, not just some.

The algorithm served as a mechanism for decision making that allowed for evidence-based practice in both screening and instrumentation. Early in the pandemic, there was a significant shift in clinical practice at our institution. At that time, administratively, instrumentation had ceased in our facility, as it had in many facilities across the nation and the world. The algorithms allowed SLPs to advocate for and deliver care to the patients with the most critical need. This type of decision-making was mirrored throughout the pandemic in all health care systems. As they evolved with the science, the algorithms also allowed service delivery to move toward pre-pandemic workflow in real-time. While many facilities halted services and withheld best practice indefinitely, the evolution of the algorithms as a tool allowed the administration to continuously deliberate from an ethical perspective and shift practice in a way that was optimal for patient care.

Generalizing use of algorithms

The algorithms that were used during the pandemic were successful at remediating viral spread in our staff. It should be noted that the successful execution of these procedures and algorithms was dependent upon available resources and support for the proposed processes. For example, in the future, facilities that are not successful in procuring early PPE could have difficulty carrying out these procedures. Likewise, administrative guidance and involvement in day-to-day clinical workflow was critical early on in the pandemic. Facilities without this support could be challenged to follow this algorithm. Finally, return to instrumental assessment is discussed in the context of the gold standard for swallowing assessment. Facilities without ready access to instrumental assessment may not be able to prescribe to the proposed workflow. Thus, this clinical information would be most easily translated for use in facilities that were able to secure the necessary supplies and support for the workflow. Generalizability might be more limited for facilities without these resources.

Conclusion & Future Insights

While the pandemic is over, it is critically important that those in healthcare consider what knowledge has been gained through this challenging time and how it can be applied to future healthcare crises. Critical to our center's success at keeping staff safe and making a measured return to best practice in swallowing assessment was early investigation into the available science, beginning with a conservative approach to service delivery, and ongoing reception to pivoting our practices as the science evolved. Interdisciplinary collaboration and practice alignment was imperative in meeting the goal of keeping our staff safe and returning to best practices. The relationship with otolaryngology and radiology was essential given the fact that our services in SLP are unique and not widely understood. Having a SLP involved as a content expert was a necessary component to ensuring staff and patient safety. This proactive approach with other colleagues as well as clear communication with medical leadership was critical to our process. Early and ongoing advocacy for procurement of and access to PPE will remain a high priority in future crises.

Communication was critically important and will continue to be a vital part in any health care crisis. In this case, communication with medical leadership, systemwide operations, clinical staff, support services, infection prevention, and allied healthcare colleagues was essential as information and practices were evolving so quickly. The use of the algorithm was a successful tool for clinical decision making and communication both in our hospital as well as other facilities in the healthcare system who did not have policies in place for instrumental assessment. While the pandemic was a significant challenge in healthcare delivery, perseverance, informed decision making, and advocacy were critical aspects of a successful algorithm for swallowing assessment during the pandemic. Should another healthcare crisis arise, knowledge gained during the pandemic can inform other institutions who have similar staff safety and healthcare delivery goals.

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