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EDITORIAL

The Long-Term Effects of COVID-19 on Dysphagia Evaluation and Treatment

Fear of the viral syndrome *severe acute respiratory syndrome coronavirus 2* (SARS-CoV-2) termed COVID-19 (ie, coronavirus disease 2019)[1] is real. Government mandates intended to reduce the rate of transmission, such as *social distancing* (read as *physical* distancing), community *lock-downs*, and public masking, are the only options available for containment.[2-4] This *new normal*, amid the constant threat of COVID-19, has led to an upheaval in rehabilitation care, forcing us to rethink the manner in which we deliver it.

Aerosol generating procedures + vulnerabilities = opportunities

The virus is with us and will likely remain so, even when the more stringent methods of disease mitigation have been lifted. Rehabilitation professionals work physically close with patients, caregivers too. Health care professionals who make a living assessing and treating the oropharynx, nasopharynx, larynx, and upper and lower airways, the anatomical *epicenters* of the SARS-CoV-2 virus, share the responsibility for constructive clinical engagement. Specific to dysphagia assessment, highly affected geographical regions have limited use of the gold standards—videofluoroscopic swallow study (VFSS) and flexible endoscopic evaluation of swallowing (FEES). Less affected regions have adjusted practice to address safety concerns. Under the current regime, guided by professional societies down to departments of clinicians, VFSS and FEES are considered: (1) aerosol generating procedures[5-7] and (2) *elective* procedures (defined as neither *emergent* nor *urgent* for medical care[7-9]). The irony is that patients with COVID-19, especially those postextubation from mechanical ventilation in intensive care units, may be among those who need these procedures most.[10,11] Moreover, if we take the perspective that all patients with a potentially compromised (ie, vulnerable) airway may be carriers of SARS-CoV-2 (ie, person under investigation[12]), determining a *safe swallow* of foods and liquids may be less relevant than quantifying the degree of airway risk. In this light, VFSS and FEES are both insufficient and unsafe. We are caught in a clinical time warp, assessing patients with little more than clinical examinations. How do we resume evaluations of swallowing and airway protection in this post-COVID-19 world?

We could consider risk stratification of airway vulnerability with noninvasive imaging and noninvasive metrics. Assessments could include such swallowing characteristics as laryngeal structure and dynamics, lingual deformation during swallowing, airway compromise during swallowing, and efficiency of swallowing physiology. Among the methods that address these characteristics are noninvasive imaging,[13,14] strength or somatosensory testing,[15-19] patient-reported symptoms,[20-24] accelerometry,[25-29] cervical auscultation,[30-33] and swallowing frequency.[34-37] Still largely being developed and what many might consider *not ready for prime time*, none of these methods have been substantively tested in the clinical setting. Characterizing pathology across the spectrum of diseases, distinguishing macroscale from microscale aspiration, and quantitative assessment of airway vulnerability and its risk of pneumonia using tools with translatable and reproducible metrics to clinical outcomes are needed—now more than ever.

We must embrace noninvasive testing of swallowing and airway safety. Combining a detailed medical history, validated patient-reported symptoms inventory, and cranial nerve examination are a good start, but with variable reliability,[38] but this cannot be all there is. We need to work constructively with industry and regulatory bodies to develop and test inventions for routine, value-based care. Health care, especially rehabilitation, is dynamic. This necessitates continued engagement with third-party payors, including state and federal governments, to welcome and respond to these changes. Skepticism and reluctance need to be quelled when innovation and onboarding must be the ever-present themes. "We've always done it that way" never was an acceptable ideology.

Directing different resources differently

Outpatient visits have been severely restricted, redirecting resources to address acute care hospitalization demands. This will continue for some time after *the curve* has been flattened. In the months and years that follow, when supplies are restored and personnel resume *business as usual*, we will endeavor to overcome the economic burden of this medical tragedy. Stimulus packages to individuals will not make a dent in the medical bills many thousands of patients face posthospitalization needing rehabilitation. The rehabilitation burden is only at the beginning, severely lagging the onslaught of hospitalizations climbing as high as 31% in the United States.[39-42] Worse, the economics of rehabilitation are far-reaching, impacting many professions and patients, all with no end in sight.[43,44] Strokes, for example, have not stopped since the pandemic began; rather, they have increased.[45,46] Dysphagia is no different,[47] never mind the ongoing threat of airway invasion in the context of weakness from both SARS-CoV-2 and acute care hospitalization. Patients need follow-up, but we must mitigate the challenges of treating patients when physical contact may be harmful for all involved. Creativity and resourcefulness are needed to meet patients' needs. Enter telehealth.

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Various applications, including electronic medical records systems and video conferencing platforms, are being used to deliver health care, many long before the SARS-CoV-2 outbreak. Remote methods of assessing or treating dysphagia are nearly 20 years old.[48-50] Such methods may not be standardized or generally implemented in clinical settings due to technological insufficiencies, lack of training, and issues related to billing and reimbursement. Moreover, telehealth may not be a panacea or used for all patient populations.[51-53] Despite these apparent limitations, patients are still able to follow-up with providers and at least receive limited care where they would otherwise be refused care until systems for reentry and clinical pathways are more established.

At the time of printing, specifically in the United States, Medicare temporarily waived requirements in 42 CFR §484.55(a)(2) and §484.55(b)(3), permitting speech-language pathologists to remotely evaluate and treat speech production and fluency, language comprehension, and voice (CPT 92507-08, 92521-24),[54,55] yet clinical swallowing evaluations (CPT 92610) and swallowing treatment (CPT 92526) *remain not covered*.[54,55] Medicare beneficiaries, 64 million in 2019,[56] have a forced choice: (1) suffer with dysphagia while hoping for *spontaneous recovery* and fear the worst-case scenario of being rehospitalized with pneumonia due to impaired airway safety, or (2) pay out-of-pocket for telehealth services that—currently—will not be reimbursed, further straining personal economics and *still* risk rehospitalization with pneumonia due to impaired airway safety. All of these limitations now can be reconsidered. Wearable technologies allow clinicians to remotely assess minute-to-minute physiological performance (eg, swallowing frequency) or monitor physiochemical components of exhaled air as a metric of aspiration. These technologies for dysphagia are not clinical realities; telehealth is the best we have.

In the end, distinguishing between clinical practice and innovation is a false choice. Clinicians are responsible for meeting the challenge of COVID-19 by identifying new methods wherever they exist. Researchers must strive to find clinical relevance to match their innovations. SARS-CoV-2 has dictated that those who manage dysphagia must evolve. And so, we shall.

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