

The Critical Role of Speech Therapy for Neurocognitive Symptoms in Post Acute Sequelae of COVID-19

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ABSTRACT

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Opinion

SARS-CoV-2, the novel coronavirus that causes COVID-19, has been circulating around the globe since late 2019 and has infected 412 million people worldwide as of February 2022 [1]. Most people infected with COVID-19 recover fully within a few weeks, but around 10 percent of people will develop lingering symptoms that can last for months or even years [2]. This condition lacks universal definition and terminology, but has been referred to as Post COVID syndrome, Long COVID, Long-Haul COVID, and more [3]. The National Institutes of Health refers to this as Post Acute Sequelae of COVID-19 (PASC) whereas the Center for Disease Control uses the umbrella term of Post COVID Conditions. Despite a lack of an established definition, most authors refer to symptoms that last longer than 12 weeks after acute COVID-19 infection that cannot be attributed to another cause [3]. The symptoms of PASC vary in terms of severity and presentation. The most common symptom is debilitating fatigue, but many patients report ongoing pulmonary symptoms (most commonly cough and/or dyspnea), cardiac complaints (such as chest pain, palpitations, and/or tachycardia), gastrointestinal symptoms (including nausea, vomiting, diarrhea, and/or abdominal pain), neuropsychiatric concerns (such as

cognitive impairment, sleep disturbances, depression, and/or anxiety), renal signs (most commonly chronic kidney disease), dermatologic changes (such as skin rashes and/or hair loss), anosmia, ageusia, and more [4-18].

Patients who are hospitalized or require intensive care unit level care during their acute illness are more likely to develop PASC, but many with mild illness are also at risk [19-21]. One of the more debilitating post-COVID conditions is neurocognitive impairment, the so-called post-COVID brain fog. More than one in five patients who have been infected with SARS-CoV-2 report cognitive impairment, which can result in deficits in memory, executive functioning, and attention [18]. It is not clear why people are developing cognitive symptoms, but the evolving evidence points towards neuroinflammation, either from direct viral invasion of brain tissue or dysregulation of the neuroinflammatory system, effects on cerebral blood vessels and coagulopathies, or damage from ischemia during periods of hypoxia in the acute phase of illness [22-32]. Much is being written describing post-COVID conditions and the proposed pathophysiology, but much less has been described regarding treatment options for this condition.

We, at the University of Kansas Health System Post COVID Clinic, have found that speech therapy plays a critical role in getting people through their recovery more quickly. At our institution, we have seen 618 patients with PASC and we have had 177 patients suffering from neurocognitive symptoms who have been enrolled in an intensive outpatient speech therapy program. As this is a new disease entity with a large patient burden, our speech therapists do not have established protocols to follow. As a result, they have been repurposing techniques used for post concussion syndrome and other traumatic brain injuries to help speed recovery.

Our speech therapists have noted that patients' presentations are similar to those with concussions and other traumatic brain injuries, which are conditions with which they are much more familiar. At our institution, patients' speech therapy evaluation begins with a referral by the patient's primary care physician or physician in our Post COVID Clinic. Referrals are commonly placed for patients who report brain fog, memory deficits, and word finding or speech problems. The initial evaluation generally includes a comprehensive cognitive communication evaluation by the Speech Language Pathologist. This includes, but is not limited to, assessing the areas of executive functioning, attention, memory, language, naming, and visuo-spatial skills. This may be done through administering cognitive screenings and/or standardized testing measures, such as the Montreal Cognitive Assessment (MOCA). Patient-reported outcome measures may be beneficial for both the patient and the therapist in guiding therapy and also as an aid in the recovery process. Deficits are usually in the mild to mild-moderate range and in the areas of attention, executive functioning, and memory. Once deficits are identified, treatment may begin. Some patients who score within normal limits may still benefit from additional treatment, which often comes as a relief to them. Compensatory strategies, as part of the rehabilitation process appear to benefit both sets of patients, those with and those without specific deficits.

This appears to be beneficial as brain function returns to baseline or continues to heal. History of anxiety, depression, attention deficits, PTSD, may be exacerbated and need to be addressed by additional professionals, including vestibular function by the physical therapist. In addition to traditional Speech Therapy methods focused on improving cognitive communication deficits identified during the evaluation, basic cognitive compensatory strategies for the home, school, work or community settings are generated and trained. Strategies may include environmental, memory, attention and organizational strategies. In our experience, speech therapy has been the key for our patients' recovery from their neurocognitive symptoms. Most of our patients have been

able to return to work, school, and life as they knew it prior to their infection with COVID-19. As the public health burden of PASC grows, we will need increased access to speech therapy services. We will also need rigorous research studying the outcomes of PASC patients who undergo speech therapy. In conclusion, Speech Therapy is an integral part of the rehabilitation for patients with PASC who experience neurocognitive impairment. Of the 618 patients who have been attended by our institution's Post-COVID Clinic, 177 have participated in Speech Therapy and overall experienced benefit. We recommend that other providers who are caring for patients with PASC consider referral to Speech Therapy, particularly for those patients with neurocognitive symptoms. We also believe there is a need for further research in this area to better understand the outcomes of PASC patients who undergo Speech Therapy.

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