

## Rethinking Hospital-Associated Disability for Patients With COVID-19

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**B**etween February 1 and July 1, 2020, SARS-CoV-2 killed over 120,000 people in the United States alone. Nearly 80% of deaths occurred in those 65 years and older; by contrast, this age group constituted only 65% of deaths from influenza during the same time period.<sup>1</sup> Though the reasons for these differences have not been completely elucidated, one thing is abundantly clear: Our nation's oldest and most frail have been among the most likely to die of COVID-19. With an estimated mortality rate of 4.7% in the United States, we are fortunate that most infected patients survive<sup>2,3</sup>; however, many survivors require an exceptionally long hospital stay in isolation. Hospitalizations for patients with COVID-19 are distinct and confer a high risk for hospital-associated disability (HAD). HAD, defined as a new loss of ability to complete one or more activities of daily living (ADLs) without assistance after hospital discharge, occurs in approximately one-third of all hospitalized patients.<sup>4</sup> In this perspective, we explore why HAD might be worse in patients with COVID-19 and offer new models for delivery of physical and occupational therapy to help them with functional recovery during and after hospitalization.

### HOSPITAL-ASSOCIATED DISABILITY BEFORE COVID-19

Functional decline, a life-altering condition that patients experience as part of posthospital syndrome,<sup>5</sup> is characterized by loss of mobility, cognitive decline, and HAD. The effects of functional decline can lead to a cascade of readmissions, institutionalization, and even death. During hospitalization, patients spend 87% to 100% of their time in bed. This immobilization is a major contributor to the development of HAD.<sup>6,7</sup> The \$58.5 billion dollars in yearly Medicare spending that is attributed to post-acute care also highlights the financial toll arising from such disability.<sup>8</sup> Early mobilization with physical and occupational therapy is important to prevent HAD. However, even under normal conditions, care teams face innumerable barriers to mobilizing patients: symptomatic patients can be resistant to mobilizing during illness, providers have fears of worsening symptoms or falls, and some providers are unaware of the importance of mobilization. In patients with COVID-19, the barriers are only magnified.

### HOSPITAL-ASSOCIATED DISABILITY DURING COVID-19

Given the increasing numbers of COVID-19 survivors discharged from the hospital, it is critical to consider why HAD could be an even larger problem in these patients. Consider their age, symptom burden, and illness severity: Among 5,700 patients who were admitted for COVID-19 in the New York City area, most were elderly (median age, 63 years), many were tachypneic (17%), and many required supplemental oxygen (28%).<sup>9</sup> Fourteen percent of these patients required care in the intensive care unit (ICU), most of whom required mechanical ventilation (86%), which independently places them at higher risk of HAD. Given these severe respiratory issues in COVID-19, mobilization may cause significant discomfort. Being symptomatic is, by far, the most common reason hospitalized patients refuse to ambulate.<sup>10</sup> As a result, this could make early mobilization for these COVID-19 patients exceptionally difficult.

Patients with COVID-19 also experience prolonged hospitalization. The median hospital length of stay (LOS) is 9.3 days for survivors of SARS-CoV-2 infection compared with the 7-day average LOS for patients with pneumonia requiring ICU admission and 5-day average LOS for patients with influenza.<sup>11-13</sup> Complications of COVID, such as cardiac injury, critical illness polyneuropathy or myopathy, or cognitive impairment, also contribute to the significant need for rehabilitation long after recovery from the acute illness.<sup>14</sup>

Physical and occupational therapy involve prolonged close contact with patients, a known risk factor for contracting SARS-CoV-2.<sup>15</sup> For staff, mobilizing a patient with COVID-19 takes longer due to intricate PPE donning and doffing procedures and patients requiring rest breaks because of weakness and respiratory-related recovery time. For patients who are mobilized, their activity is constrained by isolation restrictions that prohibit patients from leaving the confines of their hospital rooms. On March 23, 2020, the World Confederation for Physical Therapy (WCPT) endorsed guidelines created by the Australian Physiotherapy Association (APA) on caring for patients with COVID-19 acknowledging this risk<sup>16</sup>. The guidelines suggested that personal protective equipment (PPE) required for reducing risk of droplet transmission is appropriate for some scenarios, but they noted that exercising may induce coughing or expectoration, which could make physical therapy an aerosol-generating procedure. Therefore, the guidelines recommended that therapists wear N95 masks and recommend that direct face-to-face physical therapy should be limited to patients with certain functional limitations, including frailty, multiple comorbidities, and advanced age.

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Patients with COVID-19 face additional barriers to accessing therapy services following hospital discharge. Post-acute care placement may be difficult due to limited availability of isolation rooms for patients with COVID-19 and the requirement of negative results for recovering patients. For those who manage to secure a bed, PPE shortages in nursing facilities could lead to lower prioritization of therapy interventions among staff and more bedridden days for the patients. Given social distancing restrictions, home health and outpatient therapy may not be possible for similar reasons.

The confluence of often highly symptomatic and even fragile patients, time-consuming visits with high concern for contagion, limited space to freely mobilize, and barriers to post-acute care illustrates why it is likely that COVID-19 admissions will be associated with a higher degree of HAD than admissions for other illnesses.

## COVID-19: INNOVATION IN THERAPY SERVICES

The entire healthcare system has had to evolve and innovate rapidly to combat the morbidity and mortality of COVID-19. In the case of HAD, nursing staff, new billing guidelines, hospital redesign, and telemedicine are all facilitating novel ways to mobilize patients during and after hospitalization.

To limit the numbers of staff exposed to patients with COVID-19, the APA recommends engaging nursing staff in initial therapy evaluations and simple exercises that can be performed in a hospital room. Meaningful in-room exercise for some patients may include getting out of bed and walking to the bathroom to brush their teeth or complete other ADLs. Assessment of cognition should be carefully considered for discharge planning given its effects on the patient's ability to independently participate in exercises and ADLs. For this reason, treatment and prevention of delirium or cognitive changes with interventions targeting environmental modifications, maintenance of healthy sleep-wake cycles, and orientation strategies are vital.

Therapy evaluations can also be administered remotely via phone call or video. To help facilitate telehealth visits, the Centers for Medicaid & Medicare Services has released new guidelines under the Coronavirus Aid, Relief, and Economic Security (CARES) Act. Physical and occupational therapists have been historically excluded from the list of providers able to bill for telehealth services, but the CARES Act allows physical and occupational therapists who accept Medicare part B to bill for telehealth services and e-visits. The new rule applies to patients in healthcare facilities or patients at home.<sup>17</sup> Transitioning some physical and occupational therapy to telehealth could prove to be a critical resource for patients with COVID-19 trying to regain strength and independence during and after hospitalization.

Other solutions include converting areas of a hospital into rehabilitation units solely for patients recovering from COVID-19. Alternatively, rural hospitals, which usually run below capacity, or certain post-acute care facilities that are already prepared to manage infectious patients could serve as dedicated

COVID-19 rehabilitation facilities, which can offer novel ways to continue therapy services after discharge while decreasing new exposures to COVID-19.<sup>18</sup>

Given the social isolation patients with COVID-19 experience during hospitalization, virtual group exercise classes may help for overall recovery. Most therapy companies already offer this service, and several include an app that allows therapists to monitor the patient's exercises and progress. However, when transitioning to telemedicine, it is also important to consider the needs of those who may not be able to navigate technology effectively. For example, some elderly patients can be limited by a range of issues from poor computer skills and "technophobia" to visual and cognitive impairments. Having a friend or family member available to assist with technology should be considered. Additionally, being elderly, having lower income, or having a lower level of education makes it less likely that a patient will have access to internet or smartphones. Therefore, patients with these limitations may be poor candidates for telehealth and require post-acute care for their therapy services.<sup>19,20</sup>

## CONCLUSION

With all the devastation that COVID-19 has created, it might be easy to forget the importance of physical and occupational therapy. But without this focus, the disability resulting from COVID-19 hospitalizations could inflict considerable long-lasting effects on our patients at great cost to an already strained healthcare system. Immediate changes in how we adapt and innovate these services for patients with COVID-19 are critical. It may prove to have enormous impact on patients and the healthcare system long after the worst of the virus is forgotten.

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## References

1. Provisional COVID-19 Death Counts by Sex, Age, and State. Centers for Disease Control and Prevention. Accessed April 26, 2020. <https://data.cdc.gov/NCHS/Provisional-COVID-19-Death-Counts-by-Sex-Age-and-S/9bhg-hcku>
2. Rajgor DD, Archuleta S, Bagdasarian N, Quek SC. The many estimates of the COVID-19 case fatality rate. *Lancet Infect Dis*. 2020;20(7):776-777. [https://dx.doi.org/10.1016/S1473-3099\(20\)30244-9](https://dx.doi.org/10.1016/S1473-3099(20)30244-9)
3. Coronavirus Resource Center: Maps & Trends: Mortality Analyses. Johns Hopkins University & Medicine. Accessed April 26, 2020. <https://coronavirus.jhu.edu/data/mortality>
4. Loyd C, Markland AD, Zhang Y, et al. Prevalence of hospital-associated disability in older adults: a meta-analysis. *J Am Med Dir Assoc*. 2020;21(4):455-461.e5. <https://doi.org/10.1016/j.jamda.2019.09.015>
5. Krumholz HM. Post-hospital syndrome--an acquired, transient condition of generalized risk. *N Engl J Med*. 2013;368(2):100-102. <https://doi.org/10.1056/nejmp1212324>
6. Summary Health Statistics: National Health Interview Survey, 2017. Tables P10a-P10c; p. 1-9. Centers for Disease Control and Prevention. Accessed April 26, 2020. [https://ftp.cdc.gov/pub/Health\\_Statistics/NCHS/NHIS/SHS/2017\\_SHS\\_Table\\_P-10.pdf](https://ftp.cdc.gov/pub/Health_Statistics/NCHS/NHIS/SHS/2017_SHS_Table_P-10.pdf)
7. Fazio S, Stocking J, Kuhn B, et al. How much do hospitalized adults move? a systematic review and meta-analysis. *Appl Nurs Res*. 2020;51:151189. <https://doi.org/10.1016/j.apnr.2019.151189>
8. Fact Sheet: Post-Acute Care. American Hospital Association. July 2019. Accessed April 26, 2020. <https://www.aha.org/system/files/media/file/2019/07/>

- fact-sheet-post-acute-care-0719.pdf
9. Richardson S, Hirsch JS, Narasimhan M, et al. Presenting characteristics, comorbidities, and outcomes among 5700 patients hospitalized with COVID-19 in the New York City area. *JAMA*. 2020;323(20):2052-2059. <https://doi.org/10.1001/jama.2020.6775>
  10. Brown CJ, Williams BR, Woodby LL, Davis LL, Allman RM. Barriers to mobility during hospitalization from the perspectives of older patients and their nurses and physicians. *J Hosp Med*. 2007;2(5):305-313. <https://doi.org/10.1002/jhm.209>
  11. Lewnard JA, Liu VX, Jackson ML, et al. Incidence, clinical outcomes, and transmission dynamics of severe coronavirus disease 2019 in California and Washington: prospective cohort study. *BMJ* 2020;369:m1923. <https://doi.org/10.1136/bmj.m1923>
  12. Williams S, Gousen S, DeFrances C. National Hospital Care Survey Demonstration Projects: pneumonia inpatient hospitalizations and emergency department visits. *Natl Health Stat Report*. 2018;(116):1-11.
  13. Milenkovic M, Russo CA, Elixhauser A. Hospital Stays for Influenza, 2004: Statistical Brief #16. 2006 Oct. In: *Healthcare Cost and Utilization Project (HCUP) Statistical Briefs*. Agency for Healthcare Research and Quality (US); 2006. Accessed April 26, 2020 <https://www.ncbi.nlm.nih.gov/books/NBK63484/>
  14. Simpson R, Robinson L. Rehabilitation after critical illness in people with COVID-19 infection. *Am J Phys Med Rehabil*. 2020;99(6):470-474. <https://doi.org/10.1097/phm.0000000000001443>
  15. Coronavirus Disease 2019 (COVID-19): Social Distancing. Centers for Disease Control and Prevention. Accessed April 26, 2020. <https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/social-distancing.html>
  16. Thomas P, Baldwin C, Bissett B, et al. Physiotherapy management for COVID-19 in the acute hospital setting: clinical practice recommendations. *J Physiother*. 2020;66(2):73-82. <https://doi.org/10.1016/j.jphys.2020.03.011>
  17. COVID-19 Emergency Declaration Blanket Waivers for Health Care Providers. Centers for Medicare & Medicaid Services. Accessed April 23, 2020. <https://www.cms.gov/files/document/summary-covid-19-emergency-declaration-waivers.pdf>
  18. Grabowski DC, Joynt Maddox KE. Postacute care preparedness for COVID-19: thinking ahead. *JAMA*. 2020;323(20):2007-2008. <https://doi.org/10.1001/jama.2020.4686>
  19. Eung-Hun K, Stolvar A, Lober WB, et al. Challenges to using an electronic health record by a low-income elderly population. *J Med Internet Res*. 2009;11(4):e44. <https://doi.org/10.2196/jmir.1256>
  20. Rajasekaran K. Access to telemedicine-are we doing all that we can during the COVID-19 pandemic? *Otolaryngol Head Neck Surg*. 2020;163(1):104-106. <https://doi.org/10.1177/0194599820925049>