GeriNotes

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Special Continuing Education Module Issue

Ageing in the time of COVID

APTA Geriatrics
An Academy of the American Physical Therapy Association
Age on.™

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August 2021 • Vol. 28 No. 5

In This Issue

Here's Something Special . . .
We're pleased to offer this issue of *GeriNotes* in a print edition! Watch for it to be mailed to APTA Geriatrics members in mid-November 2021.

Special Continuing Education Module

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From the President

Cathy Ciolek
President,
APTA Geriatrics

In 2016, I was honored to open the envelope and find that I had been appointed to the APTA Centennial Steering Committee. I think I cried; this won't surprise any of you who know me well. I was just so excited to have been chosen for this committee. As a team, we met in person once a year in addition to monthly zoom meetings over the last 5 years. Covid caused some significant changes to the plans for CSM and other events, but we were so pleased to be able to move forward with in-person events for Centennial weekend (September 10-14, 2021).

APTA hosted an open house for its new Centennial Center: a home for our community to be able to hold meetings, work on physical therapy issues, and promote active movement. The first in-person educational event in the building was Tim Flynn's presentation of the John H. P. Maley Lecture which focused on the need for physical therapists to be providers of "health" care in a role beyond medicine. It would be worth your time to watch the video and see the multiple references to issues surrounding ageing adults. Similarly, Colleen Kigin's Mary McMillan Lecture focused on the need to embrace innovation that inspires PT to move forward into the next century. Attendees were prepared for the discussions that followed at the Future of PT Summit.

On the business side, the APTA House of Delegates first met virtually in August to conduct elections and completed 3 motions, then followed up onsite with 2 days of meetings to update the bylaws and standing rules, and adopt motions and charges. I was honored to be there with David Taylor as APTA Geriatrics' FIRST voting delegates (picture Cathy and David). We were also joined

↑ *Greg Hartley, Bette Horstman and Cathy Ciolek at the APTA Centennial Gala*

➔ *Cathy Ciolek and and David Taylor at the meeting of the APTA House of Delegates*

for the weekend by our Centennial Scholars, Noelle Alicea and Jermain Tezeno, who had in-person meetings as a group simultaneously with the House of Delegates.

The Centennial weekend wasn't all business. The Centennial Gala at the National Cathedral in Washington, DC was a night to remember forever. We were able to gather for the first time in 18 months and celebrate all our profession has done in 100 years. Highlights of the evening

continued on page 8 . . .

From the Editor

Michele Stanley
Editor,
GeriNotes

To date, as this was written (October 5, 2021), it is clear the full numbers, costs, and morbidity are yet to be determined in this country as well as the world of the current pandemic known as COVID-19. Despite vaccine with good, though not perfect, efficacy, promise of improved medications to mitigate damage to host cells, and mounting evidence of pandemic fatigue, it is obvious that this global health crisis is far from over. Did I expect it to be over when Ageing in the Time of COVID, the topic of this FOCUS issue, was chosen by the *GeriNotes'* Editorial Board members in January 2021? Well, I was really, really, hopeful that we would, at least, be looking at the end. I bet that you were too. These are tough times to be a healthcare provider. The precautions are stressful and exhausting. The information barrage often confusing and overwhelming, even for those of us with advanced knowledge of medical practices. You know, I'm sure, exactly what I mean. It is hard to find joy in masking up even for costume and Halloween, a favorite holiday.

You need to know that, at APTA Geriatrics, we see you. We see the long hours that you have been asked to work, the rude comments from patients about precautions/masks/vaccines that you deflect; we see you modelling good health practices and optimizing movement patterns in your clients to strengthen their transition through the pandemic. We see you engaged in 100 days of service to mark our profession's 100 years. We celebrate you . . . always.

As hard as it is to live and work in this time of COVID, arguably, it is even harder to age or to be of advanced age during these times: the long stretches of limited contact with friends and family, the concern that the sweet toddler sneezing next to you in church has more than allergies, the unending grief for friends and family taken too soon, or becoming unbearably burdened with chronic post-viral burden. Ageing, as the maxim goes, is not for sissies. Our profession has a clear directive to advocate for consumers to have better access to treatment by physical therapists and physical therapist assistants, to educate the public that you are never too old to play, be strong, or dance in the rain or sunshine of life's weather. And then to help them challenge themselves to thrive and keep hope alive.

I hope that you enjoy this issue and take advantage of the opportunity to earn some continuing education credits easily and inexpensively. Member physical therapist assistants can take the CE test for free. Remember that you can still take advantage of prior Focus issues (years 2018-2020) which you can find easily on our website.

Hint: if you have a friend or colleague who is not currently a member and needs CE credits, taking advantage of all the CE opportunities from all APTA-Geriatrics sources at reduced member rates more than pays for your membership.

Treat yourself: Take one of our career-changing, excellent courses: CCEEA or Balance and Falls certification. Finally, it is time to register for CSM – a bargain at member rates with options for in-person or virtual participation.

APTA Geriatrics Journal Club

*Register for the free **Journal Club** discussion webinars and earn 1.5 contact hours. Questions for presenters may be emailed to gerinoteseditor@gmail.com before or on the day of the webinar. See what's coming up at https://geriatricspt.org/events/webinars/.*

GeriNotes

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Mission: To provide engaging content that empowers the community of physical therapy clinicians to build expertise and expand the delivery of evidence-informed care that promotes health and wellness in ageing adults.

Vision: To create an evolving online community through which clinicians develop their knowledge and skills based in shared ideals that are person-centered; and promote a world where ageing adults move, live, and age well.

Ageing in the Time of COVID: COVID-19 Impact on Physical Therapy Practice

A Continuing Education Module for APTA Geriatrics

Module Chapters

1. Introduction to COVID-19 Impact on Physical Therapy Practice
2. COVID-19 Amplifies Disparities in Health Care for Elderly and Low-Income Populations
3. Policy Talk: Economic Impacts of the COVID-19 Public Health Emergency
4. Identifying and Managing Post-Intensive Care Syndrome in Older Adults
5. COVID-19: What is the Impact on the Brain and Neurological System?
6. Nutritional Concerns in Post-Acute Care Recovery of Older Adults
7. Person of Person-Centered Care: Addressing Physical Activity/Exercise Participation through Psychosocial Factors and Messaging

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Reference List

References can be found at the end of each chapter in the module.

Objectives

1. Discuss SARS-CoV-19 virus origin, transmission, and neurologic effects.
2. Explain disparities of the healthcare system as amplified by COVID-19.
3. Understand and discuss economic costs of the pandemic on physical therapy practice.
4. Address importance of nutrition as a consideration during post-acute physical therapy plans of care.
5. Address and discuss intensive care processes, long-term survivor effects, and considerations for effective physical therapy treatment.
6. Demonstrate interviewing techniques to address person-centered care post illness.

Target Audience

Physical Therapists and Physical Therapist Assistants

Contact Hours/Continuing Education Units

Completion of this CE Module is equivalent to 4 contact hours (0.4 CEU units).

Continuing Education Certificate of Completion

A Continuing Education certificate will be provided to each participant after successful completion of the course requirements (post-test and module evaluation) and payment of a processing fee. APTA Geriatrics is a recognized component of the American Physical Therapy Association. The Academy has not applied to any state licensure agency for prior approval of this course. The module has all the components (content, objectives, qualified instructors, reference lists, and post-test) that will allow participants to submit the certificate of completion to meet CE requirements in some states. Participants are urged to check with their state licensure board to see if this course counts towards continuing education credit.

How to Obtain CEUs

To obtain CEUs for this unit, participants must complete the ONLINE post-test AND the ONLINE evaluation form. Go to geriatricspt.org/exams.

A processing fee of $40 for Academy of Geriatric Physical Therapy members and $80 for non-members is required for all physical therapist and non-member Physical Therapist Assistants. *The processing fee is WAIVED for all Physical Therapist Assistant Academy Members* – Congratulations on 50+ years and many thanks for all that you do for older adults and the profession!

Test and evaluations forms must be completed online no later than December 31, 2024. Upon submission of materials and a passing score of 80% or higher on the post-test, the Academy will email you a continuing education certificate for 0.4 CEUs. Those with incomplete submissions will be notified via email and given the opportunity to re-take the exam.

There is only ONE correct answer for each question. NOTE: This is to be performed *online only* at geriatricspt.org/exams

Ageing in the Time of COVID

An Introduction to COVID-19 Impact on Physical Therapy Practice

by Jill Heitzman, PT, DPT, PhD; Michele Stanley, PT, DPT; and Pradip Ghosh, PT, PhD, DMS

The time of this current COVID-19 outbreak began in December 2019 when a novel coronavirus was identified as the cause of a cluster of pneumonia cases in Wuhan, a city in the Hubei Province of China. This virus rapidly spread, resulting in an epidemic throughout China. The first confirmed case in the United States was identified on January 21, 2020. On January 30, 2020, the World Health Organization (WHO) declared the outbreak a public health emergency of international concern. In February 2020, WHO designated the disease COVID-19, which stands for coronavirus disease 2019. The virus that causes COVID-19 is designated severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). March 11, 2020, WHO began to characterize COVID-19 as a pandemic to emphasize the gravity of the situation and urge all countries to act in detecting infection and preventing spread.[1]

Throughout the world, countries and their healthcare personnel have employed various nonpharmaceutical interventions to reduce transmission. In addition to personal preventive measures (e.g., masks, hand hygiene, respiratory etiquette, and environmental disinfection), transmission reduction strategies include:

- Social/physical distancing orders
- Stay-at-home orders
- School, venue, and nonessential business closure
- Bans on public gatherings
- Travel restriction with exit and/or entry screening
- Aggressive case identification and isolation (separating individuals with infection from others)
- Contact tracing and quarantine (separating individuals who have been exposed from others)

These measures have been associated with reductions in the incidence of SARS-CoV-2 infection over time, with epidemiologic studies showing reductions in cases, and in some situations, COVID-19-related deaths following implementation of these mitigation measures.[2] Preventive measures along with the vaccines that became available to varying degrees dependent on geographic location and accompanying policy starting in December 2020 for "highest-risk" have resulted in further reductions of cases. Despite this, as of October 5, 2021 the *NY Times* reported world case total infections since onset at 219 million with 4.99 million deaths directly attributable to this disease.[3] The numbers change daily. The United States has surpassed 700,000 known Covid-19 deaths, making the coronavirus pandemic the deadliest in American history.[3]

Ellen Strunk, in this issue, details other aspects of the human cost.There are many issues in relation to health care and physical therapy delivery that have become solidified during the ensuing 22 months. Some of these issues were present prior to the pandemic but arose into mainstream awareness. These include those related to social determinants of health and age bias. Other issues directly relate to the COVID-19 infection and the long-term impact of this disease on quality of life across the lifespan include physiological system impacts, how health care is provided (especially in relation to PT), and intersection of disease with social determinants of health.

Previous articles in 2020-21 editions of *GeriNotes*, as well as the detailed article in this issue by Dr. Bottomley, discussed the impact of social determinants of health in relation to COVID-19 and quarantine. These include access to health care, economic factors, geographic location, ethnicity/race issues, gender, and age issues. The changes to access to health care have included both geographic and economic factors. As clinics reduced capacity or even closed doors, many people in health care lost their jobs and health care insurance. This also occurred as other businesses closed or laid-off employees. Without income, individuals may have had difficulty providing food and medicine to their family. Many regular health care office visits were cancelled or postponed. For those with chronic diseases, regular nutrition, medication, and medical visits are vital to ensure management of their disease. Exacerbations of condition occurred for many of those with chronic disease. There was further exacerbation if they also contracted COVID-19. Home health visits were shifted to telehealth. Rapid expansion of telehealth allowed greater access for some of the population but, for others, the lack of access to technology to allow for telehealth became an issue. On a positive note, telehealth provided an opportunity to demonstrate how physical therapy care can reach more people. Early indications are that physical therapy will continue to find ways to use telehealth to reach more people as this medium evolves.

Ethnic/race health disparities often go along with economic and geographic issues. Many people in ethnic minority populations have low economic occupations. This resulted in the dual risk of either loss of jobs or becoming high risk essential workers due to population

interactions at jobs such as janitorial work, grocery store cashiers/clerks, day care workers, factories, and many more. Frequently, the increase in exposure risk also came with low access to protective equipment. Low wage occupations often have low to poor health insurance by employers. The stress and anxiety of potential exposure to COVID-19, as well as potential to then bring disease home to their families, added to concerns of needing to continue to work when their children were now at home due to schools closing led to increased need for mental health services.

Numbers of ageing Baby Boomers in the previous decade had already sparked recognition of age bias. The pandemic, however, brought to the surface that age bias is rampant. The early spread of COVID-19 in senior living environments was often seen as the susceptibility of the aged. The reality is that lack of staff, protective equipment, and protective care protocol in all types of senior living arrangements were not a high priority and correlated to the increased spread of COVID-19 and death in these environments. Age continued to have an impact throughout later 2021 as severe illness resulting from variants, particularly Delta, infected/reinfected (particularly the unvaccinated younger people) and those with compromised immune status. Hospitalization numbers and health care worker stress continued to mount although severity of disease and mortality rates were reduced in the younger, over-all healthier population.

Frequency of anxiety and depression symptoms reported among U.S. adults increased after August 2020 and peaked during December 2020–January 2021. Symptoms remain elevated compared with estimates from the 2019 CDC National Health Interview Survey (NHIS). The relative increases and decreases in frequency of reported symptoms of anxiety and depression at both the national and state levels mirror the national weekly number of new COVID-19 cases during the same period.[5] The increased frequency of reported symptoms of anxiety and depression in this study indicates that mental health services and resources, including telehealth behavioral services, are critical during the COVID-19 pandemic, particularly among populations disproportionately affected by COVID-19.[5] A skillful physical therapy interview and evaluation can expose underlying depression and anxiety which impacts patient goals, plan of care, and symptom management. Sue Wenker and Jeanne Duncan provide examples of enhancing physical therapy practice with the increased psychosocial needs of pandemic survivors in mind.

Extensive pathogenesis and virology discussion are beyond the scope of this review. However, to understand the effect of this novel virus on patient outcomes, a rudimentary understanding of the disease process is necessary. SARS-COV-2, a submicroscopic infectious agent that is only able to replicate within the living cells of a host, first passes through the nasal and laryngeal mucosal membrane and then enters lung tissue through the respiratory tract. The virus may then access the blood stream causing viremia. Once in the blood stream, this virus can invade other organs through ACE-2 receptors including lungs, heart, kidney, GI tract, and brain. In the early stage of the disease caused by SARS-COV-2, white blood cell counts in the peripheral blood are normal or slightly low. Initially B-lymphocytes are reduced; with severity as well as progression of the disease both T and B lymphocytes are significantly reduced. In addition, IL-6 (Interleukin -6) increases with disease severity and can contribute to the aggravation of the disease. Common symptoms include fever, dry cough, dyspnea, headache, dizziness, generalized weakness, vomiting, diarrhea, anosmia (loss of smell) and dysgeusia (alteration of taste sensation). SARS-CoV-2 produces a heterogeneous response in the immune system; some people with COVID-19 may be asymptomatic and unaware of their viremia because of a mild immune response. Others present with inflammation involving multiple tissues and critical illness that may result in extended hospitalization, respiratory assist, and ICU stays. Excessive production of cytokines during severe COVID-19 lead to an indiscriminate immune attack on all cells which may result in an autoimmune response that may include inappropriate clotting, vasculitis, and chronic inflammation. Even "mild" cases of COVID-19 in which hospitalization was not required have resulted in respiratory, neurologic, or fatigue symptoms that can persist 3-9 months post-infection.[2] Persistence of symptoms is diagnosed as long-term or long-haul COVID. "Long-haulers" may end up with myalgia encephalomyelitis/chronic fatigue syndrome (ME/CFS). ME/CFS are the conditions where individuals are incapable to do their usual activities and often get exhausted even after performing a low level of functions, known as post-exertional malaise (PEM). In addition, some people may end up with problems thinking and concentrating ("brain fog") along with pain and dizziness.[4] As we are reminded in the article about ICU care, many survivors of COVID-19 experience not only long-lasting post viral symptoms but also the long-lasting problems associated with medically induced trauma of ICU care. The COVID-19 impact on the neurological system as discussed in the article by Pradip Ghosh, may also lead to chronic post-COVID effects that could impact the quality of life of ageing adults.

Physical therapy is a critical component of rehabilitation and recovery for persons with any critical illness and subsequent chronic after-effects. This includes awareness that, as never more urgently, physical therapists need to see patients in the holistic light of the person's contextual entirety. As healthcare providers of choice, elements of nutrition (see the special considerations of the

Merriman article), sleep and other hygiene, and mental health are within our scope of practice and need to be considered along with movement analysis and muscle strength to facilitate the return to health of those seeking our care. This will continue to be a factor not only during the continuing pandemic but in the following years as the true individual and human costs of this trauma are tabulated. As is often the case and has certainly proven true on a worldwide scale during the past 22 months, despite our best intent – sometimes we just don't know what we don't know. This pandemic has been a scary, stressful, and humbling experience for those in all aspects of physical therapy and the people that we serve. Stay tuned. This won't be the last update in our knowledge.

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Election Results

Congratulations to those elected to Board, SIG and Committee leadership positions

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Pradeep Rapalli PT, DPT, MBA

Director
Kenneth L Miller, PT, DPT

Director
Jennifer L. Vincenzo, PT, MPH, PhD

Chair, Balance and Falls SIG
Heidi Moyer, PT, DPT

Vice Chair, Balance and Falls SIG
Haim D. Nesser, PT, DPT

Secretary, Balance and Falls SIG
Beth Castellini, PT

Vice Chair, Bone Health SIG
Kathlene Camp, PT, DPT

Secretary, Bone Health SIG
Cynthia Barros, PT, DPT

Chair, Cognitive and Mental Health SIG
Alexandra Alexander, PT, DPT

Chair, Health Promotion and Wellness SIG
Cathy Stucker, PT, DSc, CMPT

Member, Nominating Committee
Carmina Lagarejos Rafael, PT, DPT

President's Message from page 3

included the choir singing on the stage, celebrating the dedication of revenue from the evening to APTA's DEI efforts, and honoring Bette Horstman. Bette is an APTA Geriatrics past-president and someone who shares a birth year with our profession. A few nights later, 2020 and 2021 APTA National Award winners were honored at the John F. Kennedy Center for the Performing Arts.

The APTA staff made great and appreciated efforts to aide attendees in adhering to public health recommendations for vaccinations, COVID-19 testing, and masking throughout the weekend. At this point, I anticipate that the Combined Sections Meeting planned for February 2022 will have a similar level of health awareness protocols; it is my hope that this weekend's successful experience will be able to lighten individual concerns about attending.

With the conclusion of the weekend's events, attention turns to the last Centennial activity: initiating 100 days of service from September through the end of the year. I encourage each of you to join in local events with your chapter/district. If there aren't any organized events, use the Balance and Falls Prevention Awareness toolkit to organize one. Many events are located on APTA Engage; visit the page and update your profile so you can view events in your area and be on the lookout for various calls for volunteers from APTA Geriatrics. We anticipate that several new positions will be posted over the next several months. Answering a call for volunteers is how I was able to serve on this wonderful planning committee.

Thank you for being a member of APTA/APTA Geriatrics and for doing your part to improve the health of society. Your dedication as a clinician, collaborator, and citizen (the theme of the Future of PT Summit) helps our patient/client's to be able to do the things that matter to them. I couldn't be prouder to be a PT and look forward to seeing what future we create together over the next 100 years.

COVID-19 Amplifies Health Care Disparities for Elderly and Low-Income Populations

by Jennifer M. Bottomley, PT, MS, PhD

The COVID-19 pandemic has impacted the lives of people throughout the world, either directly, due to exposure to the virus, or indirectly, due to measures taken to mitigate the virus' effects. Older adults have been particularly hard hit, dying in disproportionately higher numbers, especially in long-term care facilities. Non-White racial and ethnic groups have been disproportionally affected by COVID-19, as well, and represent one of the highest proportions of deaths due to the virus. Local, regional, and national government actions taken to mitigate the spread of COVID-19 have thus served, in part, to shield older adults from the virus, though not without adverse side effects, including increased social isolation, enhanced economic risk, revealed ageism, amplified racism, delayed medical treatment, and challenges getting basic needs met. This special issue of the *GeriNotes* explores the myriad ways in which the COVID-19 pandemic has affected older adults and their families, caregivers, and communities. In some states, the strategies put in place to test for COVID-19, treat COVID-19, and vaccinate against the virus have endeavored to address health care disparities and provide accessible and free services. This article looks at the disparities in health care for older and low-income populations in the United States. It proposes policies and strategies for protecting and improving the lives of older people and minority groups during the pandemic and suggests changes in education and policy approaches for addressing health care disparities now and in the future.

Introduction: Disparities in Health Care

In Mitch Albom's beautifully written novel, *Tuesdays with Morrie*, the author states, "maybe death is the great equalizer, the one big thing that can finally make strangers shed a tear for one another." I'd like to think that was the case, but the United States' response to the coronavirus pandemic disavows the idealistic perspective of death as the element that can balance all the apparent disparities we see in our society.

The most obvious imbalances in the health care and public policy systems are noted in the elderly and non-White minority groups. The pandemic underscores deep health care inequities resulting from decades of structural agism and racism and, as a result, COVID-19 kills the elderly and Black and Brown Americans at much higher rates than White Americans in comparable age groups. Residents of low-income communities, many of whom are essential workers, face greater impediments to health care access than those with more means. Many can't easily take time off from work, drive to doctors' offices, or line up childcare in order to make in-person appointments; they risk being fired and having their families go hungry.

Death from COVID-19 exposes the multi-layers of inequities in age and living circumstance, in race and income, in care and opportunity that silhouette life's journey down to its final hours. Though that experience holds many similarities, it is a reality that the pandemic has only amplified the disparities. Sadly, the coronavirus pandemic has exposed the health care disparities based on age, race, economic status, social setting and strata, access to health care (including telemedicine), education, and other socioeconomic variables. This disparity in health care is often hard to see, because it is so much easier to look the other way. This article will review these disparities and look specifically at the impact on our older adult population in the community and in nursing homes.

Disparities in Health Care: A Historical Perspective

Racial and age-related health care disparities are nothing new. In my own experience, attempting to create ways to improve health outcomes and care, especially in underserved populations, such as homeless elders, I've grown increasingly aware that many efforts to improve health disproportionately benefit privileged groups. Less privileged groups are often left behind. This ultimately serves to further imbalance equity in health care and exacerbate health disparities.

Notably, the intensity of the health and economic pain brought on by the COVID-19 pandemic has been stronger in some segments of the population than others. Exacerbating existing disparities, people from Native American, Hispanic and African American communities, as well as individuals with low incomes and those residing in urban areas, have been disproportionately impacted.

In 1985, Margaret Heckler, then Secretary of Health and Human Services, released a remarkable report based on the Task Force on Black and Minority Health studies. This report indicated that, despite significant progress in the American health picture overall, "there was a continuing disparity in the burden of death and illness experiences by Blacks and other minority Americans as compared with the nation's population as a whole." As

Heckler states, this disparity was "an affront both to our ideals and to the ongoing genius of American medicine."

The gaps have narrowed but they are pervasive in communities of color and with advancing age. In a report by Congresswoman Robin Kelly in 2015, Black Americans have higher mortality rates than any other group in the 8 top causes of death. In segregated cities, such as Boston and Baltimore, there are 20-year gaps in life expectancy of those living in poor Black neighborhoods compared with those living in economically stable, White neighborhoods. Of course, this translates to a difference in life expectancy. A baby born in a "whiter" neighborhood, according to Kelly's report, can expect to live until 87. In the lower income areas, life expectancy is 67. Yes, you read that right. A 20-year difference! This is roughly the same life expectancy as that of Rwanda where access to health care is poor and overall life expectancy for all ages is 12 years shorter than the American average for all races.

Is this disparity found only in older adults in minority groups in the United States? No. These disparities are evident across the spectrum of age. These differences are seen in the delivery room. Black babies are twice as likely as White babies to die in infancy, a jaw-dropping inequality that is wider now than in 1850 when slavery was still legal! In fact, infant mortality rates for Black babies today are higher than for White infants according to Heckler.[2] In other words, Black infants are less likely to survive their first year when compared with White babies. Black women are also at least 3 times as likely to die due to complications related to pregnancy than White women – a shocking gulf that transcends socioeconomic status.

There are several factors that put Blacks of all ages at a disadvantage. Hundreds of years of institutionalized discrimination in housing, employment and educational opportunity have left Black Americans more likely to lack access to health care, to live in poor neighborhoods with limited healthy food options and have fewer community health care resources. Additionally, those born and raised in low-income, high-crime neighborhoods are more likely to experience a phenomenon known as *toxic stress*, the result of trauma by things ranging from witnessing violence to experiencing it.

Though the United States ranks high in overall quality of health care, it performs poorly with respect to addressing gaps for underserved populations. People of color and those who live in rural and urban disadvantaged areas are less likely to receive preventive health care services, often receive lower-quality care and have worse outcomes. The COVID-19 pandemic has powerfully illustrated how health inequalities have complex roots in the larger socioeconomic, cultural and physical environments, and highlights the fact that effective solutions must incorporate the perspectives of those most affected. Negative experiences related to health care and fears of being used as nonconsenting experimental subjects (consider the Tuskegee project) often result in an unwillingness to seek medical care or preventive measures, such as the current COVID-19 vaccination opportunities that have significantly decreased the incidence and severity of the virus in the United States.

Factors That Contribute to Increased Risk for COVID-19

Some of the many inequities in social determinants of health that put racial and ethnic minority groups at increased risk of getting sick and dying from COVID-19 include:

Age: Though a factor that can't be changed, age increases the likelihood that an individual has multiple health care conditions, may be socially isolated, be in the low-income category, have mobility issues curtailing ability to access health care, and have other socio-economic factors that influence a wide range of health and quality-of-life outcomes and risks for COVID-19.[4]

Discrimination: Unfortunately, discrimination exists in systems meant to protect well-being or health. Examples of such systems include health care, housing, education, criminal justice, and finance. Discrimination, which includes racism and agism, can lead to chronic and toxic stress and shapes social and economic factors that put older adults and some people from racial and ethnic minority group at an increased risk for COVID-19.[4]

Healthcare Access and Utilization: People from some racial and ethnic minority groups are more likely to be uninsured than non-Hispanic Whites. Health care access can also be limited for these groups by many other factors, such as lack of transportation, childcare, or ability to take time from work, communication and language barriers, cultural differences between patients and providers, and historical and current discrimination in healthcare systems.[4]

Occupation/Employment: Many older adults need to continue work to provide income for themselves and their dependents. Older individuals and some racial and ethnic minority groups are disproportionately represented in jobs considered "essential." Examples include healthcare facilities, factories, grocery stores and public transportation. These positions increase exposure to COVID-19 due to many factors: close contact with the public and other workers, not being able to work from home, not having paid sick days, etc.[4]

Education, Income and Wealth Gaps: Inequities in education from lower high school graduation rates and barriers to college entrance exist throughout the United States. This limits job options with lower income and less stability of employment. This leads to less flexibility to leave jobs leading to higher risk of exposure. These people cannot afford to miss work, even if they are sick. Even when they are potentially coronavirus carriers they are required to come to work.[4] An example: In April 2021 *HealthDay*

News reported that "Meatpacking plants were the source of an estimated 334,000 COVID-19 cases in the United States, according to a new CDC study." The employees were mandated to work or lose their jobs, despite being carriers of the coronavirus. While the study assessed lost wages and deaths, it did not include long-term health care costs, or the cost of worker safety measures (if they were employed).

Housing: Some older people, racial and ethnic minority groups live in crowded conditions that make preventive strategies difficult. In some cultures, it is common for family members of many generations to live together in one household. In this case, even if the older adult is staying at home, other family members may be working outside the home and more likely to bring the virus home with them.[4]

Access to Health Care.[4]

The Digital Connection: Access to the Internet and Telemedicine

America's response to the coronavirus pandemic is showing that we can begin to address agism and racism's impact on Americans' health by changing how we access primary care. Telemedicine seems to be evolving and leading the way in response to the need for social distancing and most likely, beyond the pandemic. The use of the internet for video visits, correspondence (email, texting, etc.), and information-seeking, may help to meet social needs of older adults and decrease the feelings of depression, loneliness and isolation.

On the other side of the equation, the pandemic has been particularly isolating for older adults who choose not to use the Internet, lack necessary devices and network connectivity, or are inexperienced using information and communication technologies (ICTs). Older adults who are frail or residing in long-term care facilities are especially vulnerable to the double burden of social and digital exclusion. It is important that this disparity be addressed to equalize access to health care and decrease social isolation.

With the physical distancing required during the pandemic, ICTs and telemedicine are proving to be potent tools in providing underserved and under-resourced communities better access to both primary care and critical support services, including physical therapy. Through virtual visits, older adults and particularly people of color are finding it easier to gain access to the full range of health care that a patient can and should receive in their doctor's office, including medical, rehabilitation, behavioral health, pharmacy, social support, and even physical fitness, dental and optometry services.

In a recent study, older adults and Black American's were more likely than White people in comparable age groups to use telemedicine during the pandemic. Social determinants of health — which underpin and drive health care inequities — point to why Black and Brown Americans experience higher rates of chronic conditions such as cardiovascular disease and diabetes, two of the medical conditions that put people at higher risk for COVID-19 complications and even death.

In other data gathered in 2020 it was revealed that 93 percent of people accessing health care through telemedicine and use of ITCs were overwhelmingly represented by older adults and communities of color. Those surveyed rated their experience with telehealth as "good" or "excellent," with 63 percent of people over age 65 (50 percent of Asian, 49 percent of Latino/Hispanic, and 42 percent of Black Americans) wanting to continue with telemedicine for urgent care post-pandemic.[8]

This patient data is promising. It suggests that leveraging a broad range of telehealth tools post-pandemic could have a major impact on reducing health care disparities. This can be achieved by putting telemedicine and in-patient visits on equal footing, both in terms of payment, and by ensuring that care is provided using the same multidisciplinary, team-based approach that goes beyond addressing the physical health needs of patients.

Through its flexibility and low time commitment, telehealth gives fast, convenient access to care. By expanding access, it also promotes health equity and has proved effective and useful for those in underserved communities. But in order to get the most out of the advantages it confers, we must maximize access to telemedicine. This includes educating people in underserved urban and rural communities about telehealth and digital literacy, and providing patients and providers with the tablets, smartphones, remote monitoring equipment, and, critically, Internet access to close what's become a yawning digital divide.

Government leaders and technology partners are critical to building on this momentum. They must work to close the digital divide that prevents underserved urban and rural communities alike from gaining access to connected devices and broadband that make telehealth visits possible. By investing in telemedicine programs and building the infrastructure necessary for expanding our broadband network, we can realize the full promise of this new health care delivery technology to address historic structural inequities.

Consequences for Older Adults, Trends Related to Racial Disparities: Death from COVID-19

COVID-19 cumulative infection and death rates were higher among minority racial/ethnic groups than Whites across many states. Older age was also associated with increased cumulative death rates across all racial/ethnic groups on a national level, and many minorities (racial/ethnic groups) experienced significantly greater cumulative death rates than Whites within age groups ≥ 35 years. All studied racial/ethnic groups experienced higher hospitalization rates than Whites. Older persons (≥ 65

years) also experienced more COVID-19 deaths associated with comorbidities than younger individuals. Social distancing factors, several measures of social vulnerability, and select medical disparities were identified as being predictive of county-level COVID-19 deaths. The COVID-19 pandemic threatened the health, longevity, financial and emotional security of millions of people worldwide.

In the United States, Centers for Disease Control and Prevention provides daily updates on COVID-19 cases. By the end of 2020, over 13 million people of all ages had contracted COVID-19 and the number of deaths surpassed 260,000. Globally there were 60 million cases and recorded deaths were over 1.4 million. The largest death rate was among older adults in the United States. The older adult population are much more vulnerable, not only to the virus, but to the ramifications of isolation and complications from multi-diagnostic situations. Sixteen percent of the U.S. population are 65 and older. One third of COVID-19 cases were in those 65 and older and made-up half of the hospitalization and ICU admissions and 80 percent of the deaths in the United States. These statistics would seem to indicate that the older population was more likely to contract the virus – however, other parameters including life-long exposure to systemic racism, social and technological isolation, economic insecurities and roles as caregivers were more likely to expedite contracting the virus and death due to COVID-19.[11]

Mortality increased with age, body mass index, and the presence of hypertension and diabetes when statistics are scrutinized. Other risk factors that emerged for COVID-19 were race and ethnicity. Black and Latinx persons were disproportionately affected by the coronavirus and this incidence increased with advancing age in these groups. It appears that race and ethnicity increased the risk for exposure, their resilience in response to the virus, access to health care, and more specifically – quality health care.[12] Limited or compromised social networks were also identified as contributing to the vast racial divide in COVID-19 outcomes.[11,12] In fact, though racial differentials existed prior to COVID-19, longstanding health and social inequalities amplified the health crisis and mortality rates in marginalized older adults. These studies also demonstrated that, in both urban or rural areas, the 65 and older populations were more vulnerable to COVID-19. However, spread of coronavirus infections intensified more rapidly in urban areas where proximity to other potential carriers was greater. This draws attention to the importance of preventive and early interventive strategies based on community structure. Social distancing helps to prevent contagion, but this strategy also decreases social engagement and ultimately emotional and social well-being. Carr suggests that providing different modes of connection for older adults, "ranging from video chat to letter-writing programs," may help to meet isolated older adults' social need. Digital connections, which were discussed briefly above in this article, provide powerful tools for decreasing loneliness, as well as enhancing access to health care through telemedicine networks.

It is important to look at the longevity gap in health care related to age and racial disparities that existed prior to and, now, in response to the COVID-19 strains on the entire health care system.

In 2019, before the pandemic, the median age of death in low-income areas, which have higher racial and ethnic minorities, was 75, 3 years lower than it was in 2000 and 5 years beneath the nationwide median of 0. The median refers to the age at which half the deaths were younger and half were older. People from high-income neighborhoods in the United States last year, where there was a greater density of White residents, overall lived 15 years longer than those from poor neighborhoods. The COVID-19 pandemic poses challenges for nearly all communities across the country. Yet older people of color face even greater burdens with mounting disparities that must be identified and resolved.

As COVID-19 continues to ravage older adults and communities of color, data show remarkable disparities in outcome based on race and ethnicity. Recent data show significantly higher COVID-19 hospitalizations for Black, Latinx, and American Indian/Alaska Native Medicare beneficiaries. The rates are even higher for people of color who are dually enrolled in Medicare and Medicaid. Racial and ethnic inequities in health care are magnified in long term care settings as nursing facilities have seen some of the largest outbreaks of COVID-19 infection and devastating mortality rates. In particular, facilities with predominantly Black and Latinx residents have significantly higher numbers of infections and mortalities compared to facilities with predominantly White residents. Older Asian Americans and Pacific Islanders (AAPI) experience additional hardships. Since the beginning of the pandemic, older AAPI were subjected to xenophobic harassment, leading to social isolation long before stay-at-home orders took place.

The pandemic exacerbates health care inequities for older adults with some states and hospitals implementing crisis standards and rationing that limit access to life-saving treatment. These standards often include ageist, ableist and racist policies that triage resources to the healthiest among us. While advocates are working to resolve discriminatory standards, many still include biased policies that disproportionately impact older adults of color. For example, many policies consider a patient's long-term survivability based on their existing health issues, even if they are likely to survive COVID-19. Due in large part to systemic racism and reduced access to health care, older adults of color have higher rates of conditions like diabetes, hypertension, and heart disease. Using a patient's life expectancy creates policies that exacerbate existing health inequities among communities of color. Crisis standards must triage resources in a manner which does not include ageist, ableist or racist

policies or compound long-standing inequities in health care.

This moment creates an opportunity to dismantle the inadequate and racist systems that underpin our long-term and health care infrastructure. While care facilities can exercise safe infection control measures to reduce the spread of Coronavirus, access to Home and Community-Based Services (HCBS) allow older adults and persons with disabilities to avoid nursing home placement by receiving services in their homes or communities, and would do much more to save lives and reduce the spread of the virus.

Current Political Initiatives: Age and Racial Disparities

Social Security and Medicare, whose benefits have proven so essential during these difficult times, need to be preserved and strengthened. All Americans, especially those over the age of 65, are counting on those benefits to help ensure their retirement security. The economic downturn and pandemic relief have increased our national debt, yet in the long run, the economic future will be enhanced for the entire U.S. population. We need to protect Social Security and Medicare. These are important earned benefits for our ageing population regardless of race.

In our nursing homes and long-term care facilities, seniors have faced isolation conditions and life-threatening outbreaks of the coronavirus. Deaths within nursing homes account for about 35 percent of all COVID-19 fatalities in the United States. Meanwhile, many seniors who are isolated at home and struggling financially cannot afford adequate food or safely leave their homes to shop. We cannot ignore these obvious disparities in resources and access.

Our Generational Challenge

What accounts for significant inequities in health care of our fellow citizens? A growing body of research suggests that the health care system as well as healthcare professionals contribute to these disparities.

Improving health outcomes across the board demands that we transform the health care system itself. In a health care system where quality of your care does indeed depend on your station in life, the reality is that health care is still a privilege and not a right in this country. Imagine if U.S. health care coverage was based not on how much you can pay but instead on your health needs. The purpose of the system would be to maximize good health care outcomes rather than maximizing profits. Getting sick would no longer mean risking bankruptcy. Employers would no longer have to spend so much to provide health insurance for their employees if health care coverage was a right for every citizen. This model of care for ALL has been demonstrated as quite effective in many countries with much better health outcomes and lower health care costs overall.

Disparities in health care provision are often due to unconscious, implicit bias seen in healthcare professionals, like that demonstrated in some law enforcement and legislative agencies. All of us absorb social stereotypes and assumptions, often without even realizing it. Left unexamined, these ingrained biases risk leading us to behave in discriminatory ways, which can have profound consequences in fields like law enforcement, criminal justice, policy and legislation, education and health care.

We need every medical and allied health school in the country to require implicit bias training for their students. We need implicit bias workshops in every healthcare setting for all healthcare professionals and support staff. When people are given the knowledge that implicit bias is real, and everyone honestly addresses their own predispositions, it gives them room to think more openly and without bias in their daily actions. Awareness of our own prejudices will lead to better decisions and better care.

Additionally, each health care school needs to focus on proactively bringing more diversity into the field. There is a sizable gap in the percentage of White students to students of other colors. This gap is vast in the field of physical therapy. Closing this gap would be a wonderful first step. If we intend to close the disparity health care gap, a student body that reflects the community make-up would be a great place to start. It certainly won't be easy. It'll be a generational challenge. It's time we get started in more proactivity addressing the disparities in health care. My optimism leads me to predict that the new generations of physical therapists will not carry the inherent biases of their predecessors forward.

What Happens After COVID-19?

IS death the Great Equalizer? This article says no, in fact, it is not. The same inequities that complicate life for so many people can also determine access to health care, longevity, quality-of-life, and when and how they die. That was the case before the pandemic, throughout the virus's rampage, and, without apparent hard changes, as we hopefully move out of the pandemic crisis. It can be predicted that these disparities, without proper corrective initiatives will persist long after the disease is out of our lives.

It is far past the time to eliminate the institutional bias in Medicaid by requiring states to cover Home and Community Based Services (HCBS) the same as states currently are required to pay for institutional care. But this is not enough. We must also address other forms of racial discrimination that negatively impact the quality of HCBS older adults of color receive and the racist policies that have denied older adults of color access to housing. The shocking rates of homelessness among older Black Adults leads to worse health outcomes and reduced life expectancy.

Eliminating the systemic racism resulting in health disparities among older adults of color is a massive undertaking. Beyond implementing policies to ensure equal access to HCBS, it is critical that policymakers and administrators at every level of government center equity in responding to COVID-19 to mitigate additional and growing disparities. Federal and state agencies must collect and provide more intersectional data on racial disparities in health, housing, and long-term care among different communities of color. Healthcare providers and insurers must improve language access and cultural competency. Finally, providers should be required to undergo racial justice and implicit bias training and receive support to address disparities and prejudicial crisis standards of care.

The imbalances come blaring forth, when we look at health care and public policy in the United States, especially for the elderly, Black, and Brown communities. When we evaluate health care, specific to COVID-19, it is obvious that the coronavirus pandemic has uncovered numerous inequities in health care and in public policy. Though the coronavirus can strike anyone in any age group, social strata, race, in any setting without prejudice or preference to an age, race or income level, deaths related to COVID-19 demonstrate strikingly how apparent it is that death is quite the opposite of a great equalizer.

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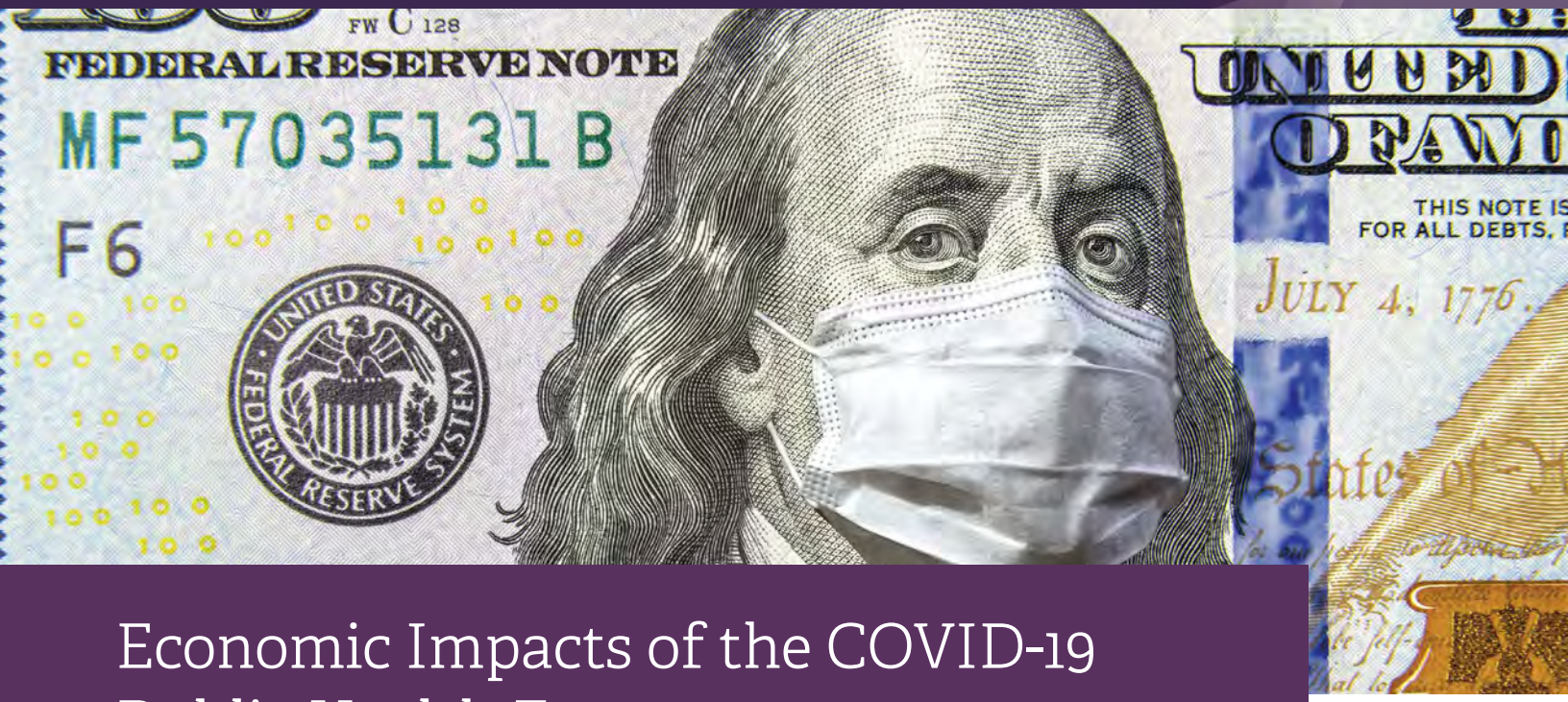


Economic Impacts of the COVID-19 Public Health Emergency

by Ellen R. Strunk PT, MS

By 2025, the emergence of the novel coronavirus and its variants (COVID-19) will have cost the world between $16 trillion and $35 trillion.[1] Since 2014, the growth of national health expenditures has been consistent. Even into the first 2 months of 2020, annual growth ranged between 4.3 and 5.6 percent, and peaked at 5.9 percent.[2] Beginning in March, and over the next 3 months, health spending plummeted 20.1 percent as elective surgeries and procedures were cancelled, and the majority of Americans chose not to seek care in order to reduce exposure to the COVID-19 virus.[3] Health spending gradually picked back up again during the summer and fall of 2020, but did not recover to pre-pandemic levels. In fact, for the first time since at least 1960 (when CMS began tracking national health expenditures), total health spending in 2020 was less than the previous year.[4]

The U.S. Bureau of Economic Analysis released its preliminary look at national health spending for the entire year of 2020. The biggest contributors to the decline in spending were hospital care and dental care (See Figure 1), while spending on prescription drugs and home health care increased for the year.[5] Nursing home spending was already among the slowest-growing components of U.S. health expenditures, but the pandemic accelerated that downward drift. Additionally, while many sectors began to see rebounds in occupancy and volume, the rebound in nursing home admissions was much more subdued. This is likely driven by 3 factors: (1) the negative publicity nursing homes received when COVID-19 was concentrated in these communal living environments; (2) as elective procedures remain on hold in many areas of the country, the need for post-acute care in nursing home is reduced and where elective procedures have resumed, many patients elect to receive post-acute care in their home; (3) the associated costs of the pandemic, including personal protective equipment (PPE), additional staff and testing. In fact, in 2020, nursing homes spent roughly $30 billion on PPE and additional staffing alone.[6] In an August 2020 survey of nursing home operators, 72 percent of respondents reported an inability to maintain their operations through 2021 and 40 percent said they won't last another 6 months.[7] In fact, since 2014 more than 500 nursing homes have closed their doors, the ripple effects of which are felt throughout the nursing home's community workforce and economic fabric.[8] Most of these residents have had to be displaced away from their loved ones and familiar communities because they have multiple underlying health conditions that require around-the-clock, specialized care that just cannot be provided in the home. While 120 nursing homes closed in 2020, more than $21 billion in federal and state pandemic relief likely helped to slow the rate of nursing home closures and prevent many from occurring in 2020.[9]

While the news appears positive for home care[10] and home health agencies,[11] the pandemic has worsened the industry's long-standing challenges. A study conducted by the Office of the Assistant Secretary for Planning and Evaluation (ASPE) found the COVID-19 created new challenges for the industry as well as intensifying the issues already present. For example, staffing shortages were

exacerbated by recruitment and retention problems, limited training and career advancement opportunities, and poor pay and benefit for these workers. In some states, home care workers were not recognized as "essential workers" and their access to PPE, testing, and vaccines were significantly delayed.[12]

Will pre-pandemic spending patterns emerge again? That remains to be seen. There could be pent-up demand for elective procedures when hospitals are finally able to return to non-emergency protocols. There could be higher rates of serious disease as a result of missed screenings and preventative care that the health care system will be forced to absorb. However, these temporary declines could become more permanent if people's behavior is forever altered. A recent report[13] indicates that these additional layers of delayed or indirect impact have the potential to far outpace the immediate effects resulting in $125 to $200 billion in incremental U.S. health system costs. They give an example of how the average cost of treating a patient with chronic obstructive pulmonary disease (COPD) could increase from $38,000 per patient per year to $41,000 per patient per year due to the expected increase in the severity of a person's systems due to deferral of care. Additionally the long-term consequences of lung disease due to a severe COVID-19 infection are yet to be known. Behavioral health is another concern. Three separate studies have recently found symptoms of anxiety and depression and "psychological distress" have increase 3-to-4 fold, and one even found rates higher than those seen after the September 11, 2001 attacks.[14,15]

Even as the health care system struggles to deal with these current issues, there is another crisis just around the corner. The Medicare Hospital Insurance Trust Fund is projected to become insolvent in 2024 or 2026, just 3 to 5 years from now. The projected insolvency date has bobbled up and down over the last several years, depending on changes in law, the economy and other factors.[16] But this new projection is one of the shortest on record, and it has been exacerbated by the fact that COVID-19 resulted in people losing their jobs, which meant that there was less money coming into the Medicare program's payroll-tax revenue fund (see Figure 2). On the other side of the equation, the COVID-19 relief CARES Act took $60 billion from the Medicare trust fund to help support hospitals during the height of the pandemic crisis last year. Plus, there are more beneficiaries accessing Medicare as the population ages and more Americans are living longer.

There has also been a drop in Medicare Part B physician/supplier spending, i.e., those services paid for specific to the Medicare Physician Fee Schedule (MPFS). The patterns were largely the same as those already presented, but an analyses[17] conducted by the American Medical Association (AMA) based on quarterly Medicare "carrier" files for quarters 1 and 2 of 2019 and 2020 illustrated the effects on specific services. Overall MPFS spending was $9.4 billion or 19 percent lower in Q1 and Q2 of 2020 versus 2019. While it showed rebounds toward the end of Q2 2020, it remained 10 percent below levels of spending in January of 2020. Spending by place of service also showed changes that are not surprising. MPFS spending in ambulatory surgery centers were hit the hardest with an almost 90 percent reduction in April 2020, with some procedures coming to a near halt (colonoscopy and cataract surgery). MPFS spending in skilled nursing facilities suffered the least at approximately 25 percent in April 2020, but also have displayed the weakest recovery. The cumulative reductions in MPFS spending from January to June 2020 as compared to the same time period in 2019 showed the scope of the COVID-19 impact on the physical therapy profession. Physical therapists showed a 34 percent drop in MPFS spending, the highest of 34 specialties examined in the report. And while the profes-

Figure 1. 2019 versus 2020 Healthcare Spending[5]

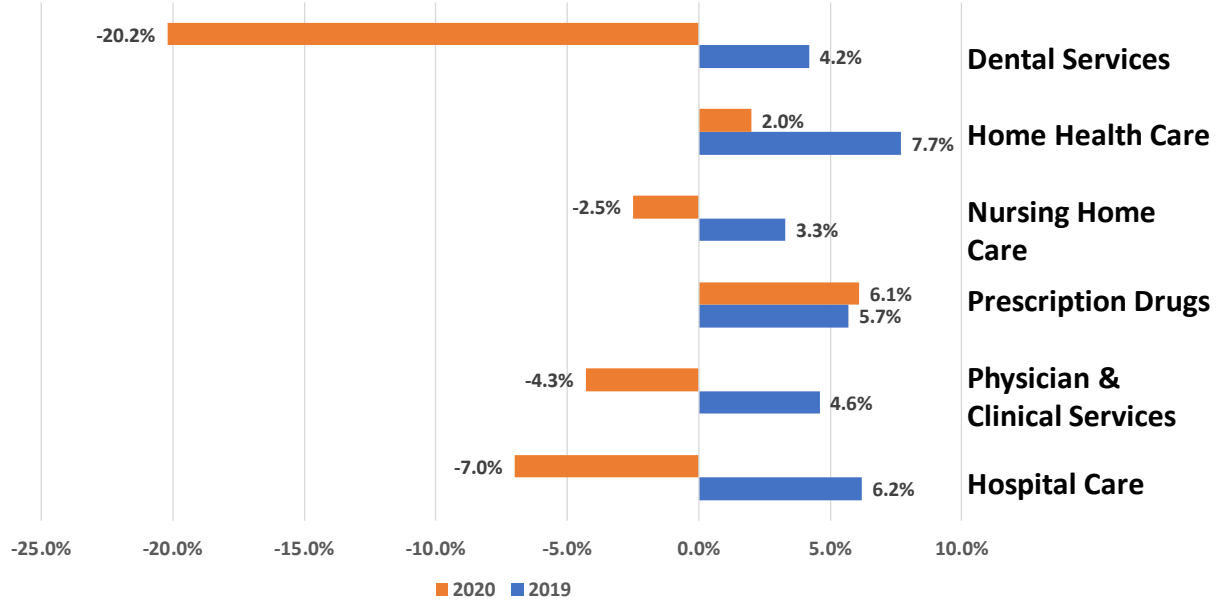
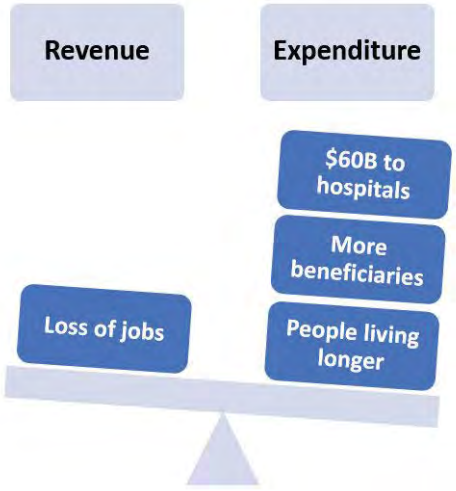


Figure 2. Financial Strains on Medicare System



sion fought for the ability to utilize telehealth services, the actual utilization of these services was lower than many of the specialties, at only 2.9 percent of services between March 16, 2020 and June 30, 2020.

So what is the take-home message? One message may be to understand that the entire healthcare sector has been affected by the pandemic and will likely continue to feel the pressures and challenges. A recent APTA workforce study[18] illustrated that 1 year into the pandemic over a quarter of PTs (28 percent) and about half of PTAs (49 percent) are still experiencing income loss. However, despite these income challenges, PTs and PTAs suggested that the pandemic's effect on their careers and personal lives caused greater stress that the effects on their finances. However, through it all, PTs and PTAs show resilience. Most therapists responded that the pandemic caused their career pride to increase. The second is, simply advocacy. We must persevere and never give up on working for solutions that insure access to physical therapy services for all Americans. We must look for and advocate for ways that our workforce can be leveraged to improve health across settings and patient populations. We must advocate for appropriate and fair payment to ensure the profession remains viable, and we must hold ourselves and our peers accountable to practicing at the top of our license every day.

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Identifying and Managing Post-Intensive Care Syndrome in Older Adults

by Hallie Zeleznik, PT, DPT; Ellen M. Smith, PhD, MPH, RN; Kenneth L. Miller, PT, DPT; Alecia Thiele, PT, DPT, ATC/LAT, MSEd; Alan Chong W. Lee, PT, PhD, DPT; and Patricia J. Ohtake, PT, PhD

Within the United States, over 5 million people are admitted to intensive care units (ICUs) each year[1] and 40 percent to 50 percent of ICU admissions are adults ≥ 65 years of age.[2-3] People who require care in the ICU, including older adults, may subsequently develop *post-intensive care syndrome* (PICS). PICS is a term that was coined by the Society of Critical Care Medicine in 2012 to describe the new or worsening problems that survivors of critical illness may experience following an illness requiring care in an ICU.[4] These problems can be categorized under 3 domains: physical, cognitive, and mental health (Table 1). Older adults who develop PICS are at risk for prolonged recovery of physical function and mental health.[5] For these individuals, while functional status may improve over time following hospital discharge, limitations remain beyond 1-year following hospital discharge.[6]

Our knowledge about PICS and the application of this knowledge to the care of older adults who have survived critical illness can be described in the context of a theoretical case:

Alberto is a 67-year-old Hispanic restaurant cook who has returned home after his hospital ICU stay for septic shock. His family of four includes his mother (age 96 yrs.), his wife (age 62 yrs.), and two children (ages 38, 35 yrs.). Alberto, his wife, and mother reside in a four-bedroom two-story home and his children live locally. Since Alberto's discharge, he has been sleeping fitfully in his recliner and wakes frequently. He cannot navigate the stairs to his bedroom and states he is feeling "down" and "foggy" and is unable to remember tasks long enough to complete them. Alberto's wife, Rose, works as a hospital cafeteria employee, and has transitioned from part-time to full-time to support the family as Alberto has been unable to return to work as a restaurant chef. Both children help their parents, but Rose is exhausted, getting pressure from family to continue working full-time while also caring for her husband and mother in-law.

When considering the impact of PICS on both Alberto and his family, it is essential that healthcare providers screen for the physical, cognitive, and mental health problems associated with PICS. Screening should be performed for any individuals who have had an ICU stay due to the length of recovery associated with PICS. It is important to use outcome measures known to be reliable and valid for the PICS population to ensure objective documentation of the individual's problems, comparison to normative data available for the general population, and longitudinal tracking of physical function, cognition, and mental health status.

Determination of changes in **physical function** associated with PICS can be organized using the International Classification of Functioning, Disability, and Health (ICF) Framework (Table 1).[7-10] At the *body functions and structures level,* assessment for reductions in pulmonary function, respiratory and limb muscle strength, and pain are important.[9] Shortness of breath at rest or during exercise and an ineffective cough are clinical signs of problems with pulmonary function and respiratory muscles, respectively.[11] Upper and lower extremity weakness can be assessed using manual muscle testing of the major muscle groups of shoulder abduction, elbow flexion, wrist extension, hip flexion, knee extension, and dorsiflexion. Hand-held dynamometry should be considered due to the opportunity to objectively quantify muscle group strength, compare to normative data, and track strength over time.

ICF activity limitations for people with PICS commonly include impairments in exercise capacity, gait speed, and balance. To assess exercise capacity, the 6 Minute Walk Test (6MWT) is extensively used and has been validated for use with people with PICS.[12] The walkway may be shortened to 12-meters to accommodate smaller spaces.[13] Assessing for reductions in gait speed can be performed using the 4-meter Walk Test (4mWT).[14] The 4mWT has been used with individuals following critical illness not only to measure gait speed but has been shown to be a reliable and valid measure of physical functioning.[14] Due to the increased risk of falls following critical illness, it is important to assess balance. Static and dynamic balance impairments can be detected using the Berg Balance Scale,[15-16] walking balance impairments can be detected using the Functional Gait Assessment,[16-17] and reductions in balance confidence can be identified using the Activities-Specific Balance Confidence Scale.[16,18]

Following critical illness, problems with *ICF participation restrictions* are not uncommon. These participation restrictions include reduced ability to perform activities of daily living (ADL) and instrumental activities of daily living (IADL) and return to work and driving. Approximately one-third of ICU survivors report problems with at least one ADL, most commonly bathing, dressing, and continence.[19-20] The Katz Index of Independence in ADL self- or surrogate report instrument is commonly used to identify ADL limitations.[21] New or worsening problems with IADL are reported by over two-thirds of people following ICU.[22]

The Lawton IADL questionnaire is recommended for screening for problems performing eight common IADL.[23]

Within the first year following critical illness, 33 percent of previously employed individuals are unable to return to work.[24] Inability to return to work has the potential to pose significant adversity for the individual and their family.[24] Therefore, it is essential to inquire if patients who were previously employed have been able to return to work. Based on the answer provided, appropriate treatment can be initiated, and referrals to occupational therapy and/or vocational rehabilitation services can be considered. Similarly, about one-third of people are unable to return to driving during the first year following critical illness,[8,22] impacting their ability to function in the community, attend medical and rehabilitation appointments, and return to employment. Asking the patient about their ability to drive is a quick method to identify if they have returned to driving. To better understand the reasons for not being able to drive, referral to a healthcare professional who can administer a pre-driver's assessment are indicated. Alternatively, there may be a variety of factors influencing the return to driving and discussion with the patient's primary care physician may be warranted.

Screening for **changes in cognition** should be considered due to the frequency of mild cognitive impairments seen following critical illness.[25] (Table 1) Mild cognitive impairments can be identified using the Montreal Cognitive Assessment (MoCA) allowing for relevant referrals to be made.[26] People who screen positively for mild cognitive impairment or people who have cognitive complaints even in the presence of a normal screen can be referred to healthcare professionals who have expertise in assessment and management of cognition such as a speech-language pathologist, an occupational therapist, or a neuropsychologist.

Mental health problems, including depression, anxiety, and post-traumatic stress disorder (PTSD) are experienced by individuals with PICS. (Table 1) To screen for depression, ask the patient if they have been experiencing feeling down, depressed, hopeless, or have little interest in doing things.[27] Further assessment of positive responses regarding depression and assessment of anxiety can be obtained using the Hospital Anxiety and Depression Scale (HADS).[28-30] Because PTSD occurs in 20 percent of people following ICU care,[31] screening for PTSD is recommended using the Impact of Events Scale-Revised.[32] These self-report outcome measures will inform the physical therapist if referral to mental health specialists is warranted. Coordination of services with healthcare professionals such as the patient's primary care physician, a licensed clinical social worker, psychologist, or psychiatrist is key to ensuring the person's mental health problems are addressed.

Applying these examination and screening recommendations to Alberto's case, the physical therapist's findings are described in Table 2.

Physical Therapist's Roles in Addressing PICS in the Older Adult

Before discussing the specific care plan for Alberto, it is important to understand in general terms interventions to consider in the care of older adults, especially for those with PICS. The Partnership for Health in Aging: Multidisciplinary Competencies in the Care of Older Adults at the Completion of the Entry-level Health Professional Degree states that care planning should be person-centered and directed, based on the older adult's preferences and treatment goals to meet their physical, psychological, social, and spiritual needs.[38] For all older adults, interventions need to be holistic by incorporating multiple domains in the development and implementation of the care plan. Often times, the care needs are beyond the scope of physical therapists alone and referral to other professions for psychological and mental health needs is appropriate. For older adults with PICS, it is even more important to ensure that the constellation of the physical, cognitive, and mental health problems is addressed. Knowing that recovery from PICS is a long process, providing caregiver support is another key factor for consideration.[39] A detailed review of interventions to address the physical problems associated with PICS can be found in Smith et al., 2020.[9]

Considering Alberto's level of function prior to hospitalization, including his recent ability to work full time and being fully independent, the plan of care should ultimately focus on restoration goals to return Alberto to independence in his home and the community. While the intervention strategies may need to initially utilize compensatory strategies to ensure Alberto is safe in his home and successful in his daily activities, ideally the interventions will progress towards restoration using a combination of task-specific interventions to improve strength and balance as well as aerobic exercise at the appropriate intensity and duration to improve physical functioning.[9] Considering Alberto's current HADS score and mild cognitive impairment (Table 2), recommendations to refer Alberto for further assessment and management of cognitive impairments and counseling services should be made to the interprofessional team.

Post intensive care-family (PICS-F) should also be considered as new or worsening mental health concerns among family members have been observed in up to 94 percent of families who experience PICS.[39] Due to Alberto's illness and impairment in functioning, Rose, and possibly their adult children, and even his mother, are at risk for anxiety, depression, and/or PTSD.[39] Rose, as primary caregiver for Alberto, has experienced enormous stress and an increase in responsibilities since his illness. She needs ongoing support and may benefit from for mental health treatment to address her personal needs.

Summary

Alberto's case is not unique, as 2 to 3 million older

Table 1: Using the ICF Model to Describe the Problems Associated with PICS

Physical Domain	**Problem**	**Examination strategy**
Body functions and structures	Pulmonary function	Pulse oximetry Hand-held spirometry If decreased, refer for pulmonary function testing
	Respiratory muscle strength	Cough effectiveness If decreased, refer for pulmonary function testing
	Limb strength	Manual muscle test Hand-held dynamometry
Activity limitations	Exercise capacity	6 Minute Walk Test 2 Minute Step Test
	Gait speed	4-meter Walk Test
	Balance	Berg Balance Scale Functional Gait Assessment Activities-specific Balance Confidence Scale
Participation restrictions	Activities of daily living	Katz Index of Independence in ADL
	Instrumental activities of daily living	Lawton IADL Questionnaire
	Return to work	Ask "Have you returned to work?"
	Return to driving	Ask "Have you returned to driving?"
Cognitive Domain	Cognitive function	Montreal Cognitive Assessment
Mental Health Domain	Depression	Ask two questions: 1. "During the past month, have you often been bothered by feeling down, depressed, or hopeless?" 2. "During the past month, have you often been bothered by little interest or pleasure in doing things?" If positive, follow-up with the Hospital Anxiety and Depression Scale – Depression Subscale
	Anxiety	Hospital Anxiety and Depression Scale – Anxiety Subscale
	Post-Traumatic Stress Disorder	Impact of Events Scale-Revised

adults are admitted to ICUs each year,[1-3] and many of these individuals are sent home with a constellation of lingering physical, cognitive, and mental health symptoms.[4] Physical therapists, as part of the interprofessional team, are in an ideal position to recognize and screen for potential problems associated with PICS, using the standardized measures reviewed in this article. Appropriate physical therapy interventions tailored both to the problems associated with PICS and the unique needs of older adults, along with referrals for cognitive and mental health concerns can promote restoration of previous functioning. Furthermore, supporting caregivers by recognizing the stress caregiving places on the family and facilitating referrals for their personal mental health are key. Lastly, the COVID-19 pandemic has brought global attention to PICS over the past 18 months. At the peak of U.S. hospitalizations in January 2021, approximately 20 percent of hospitalized patients were in the ICU.[40] Estimates of ICU survival rates among those with COVID-19 have been reported to be approximately 60 percent.[41] Along with the possibility of PICS, ICU survivors of COVID-19 may also experience overlapping or additional symptoms that have

Table 2: Examination Findings for Case Example

	Examination or Screening Strategy	Finding	Interpretation
Exercise Capacity	6- Minute Walk Distance	368 meters	Distance is 36% less than community dwelling males aged 60-69[33]
Gait Speed	4-meter walk test	0.65 m/sec	Risk for falls, increased likelihood of hospitalization and dependency in ADL[34]
Balance	Berg Balance Scale Score	40/56	Risk for falls[35]
ADL	Katz Index of Independence in ADL	4/6	Partially dependent[36]
IADL	Lawton Instrumental Activities of Daily Living	4/8	Lower score indicating lower abilities in completing IADL[37]
Return to work	"Have you returned to work?"	No	Screening positive
Return to driving	"Have you returned to driving?"	Yes	Screening negative
Cognition	MoCA	23/30	Mild cognitive impairment[26]
Mental Health	HADS	3/21 Anxiety 18/21 Depression	Abnormal depression subscale score30

been described in the post-viral phase, commonly referred to as "Long COVID".[42] It is time to address the growing population of individuals that are experiencing the long-lasting problems associated with PICS to improve the health of society.[43]

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COVID-19: What is the Impact on the Brain and Neurological System?

by Pradip K Ghosh, PT, PhD, DMS

Neurologic complications have been increasingly reported in individuals with COVID-19, especially in older adults with comorbidities.[1-3] About 30-35 percent of individuals with SARS-CoV-2 infection have shown symptoms related to brain dysfunctions including brain fog, memory problems, and fatigue. However, there is no clear understanding of how the virus affects the brain.

Early in the pandemic, several researchers predicted that SARS-CoV-2 virus would be able to access the brain. Their predictions were based on established presence of genetic material of SARS-CoV-1 and MERS-CoV in infected human brains. While the evidence of SARS-CoV-2 inside human brains remains unclear, autopsy studies have shown a range of recurrent neuropathological features from people hospitalized with COVID-19. Pathological changes include localized hypoxic damage, associated infarcts caused by oxygen deficiencies, and signs of inflammation including acute disseminated encephalomyelitis.

Entrance and Access of SARS-CoV-2 to the CNS

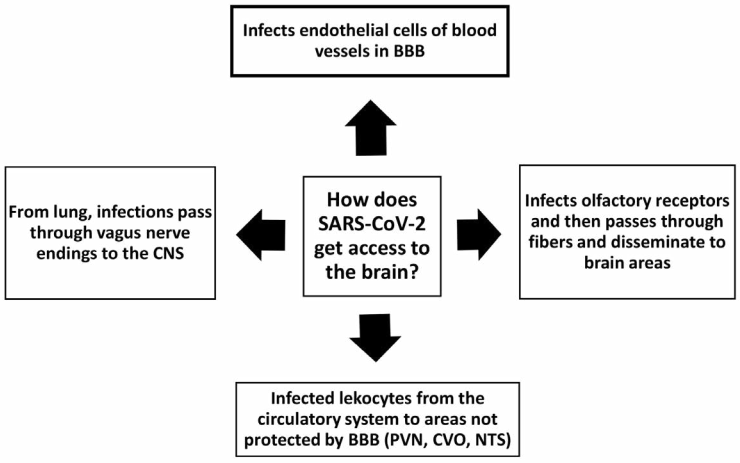
The entry of SARS-CoV-2 into the host cell is mediated through recognition of ACE-2 receptors of recipient cells. Spike protein first binds to ACE-2 receptors; this is followed by passage of virus to the host cells. The most studied pathway is through binding receptors of vascular endothelial cells of CNS, neurons, and neuroglial cells. Based on information from transcriptome database analysis, ACE-2 receptors are expressed in some areas in the brain including amygdala, hippocampus, frontal lobe, and substantia nigra.[4] ACE-2 receptors are localized in the human brainstem and mostly in the pons and medulla oblongata;[5] these areas control respiration and cardiovascular functions. In addition, ACE-2 receptors are expressed in other areas of the brain including paraventricular nucleus (PVN), circumventricular organs (CVO), nucleus of the tractus solitarius (NTS) and rostral ventrolateral medulla. These structures in the brain are highly vascularized and are not protected by the blood-brain barrier (BBB). Therefore, they are more vulnerable to circulating neurotoxic molecules as well as invasive agents. Viruses can enter the CNS including sensory nerve ending, olfactory nerve, motor neurons at neuromuscular junctions, and endothelial cells of BBB infections.[6]

Based on current evidence, SARS-CoV-2 can invade brain tissue through 2 plausible mechanisms: a) axonal transport through infected olfactory nerve fibers followed by dissemination to brain areas through trans-synaptic transmission[7,8] and b) hematogenic pathway either via infected leukocytes from the circulatory system or through infected endothelial cells of BBB.[7-10]

SARS-CoV-2 affects the CNS through systemic inflammation. SARS-CoV-2 can cause massive release of cytokines from immune cells to the circulating blood, known as "cytokine storm." Although the BBB protects CNS by limiting the access to circulating molecules, absolute segregation of the CNS from systemic circulation cannot occur. Therefore, CNS can be affected by systemic inflammation. Of importance, systemic infection in severe cases of COVID-19 is mostly associated with the substantial increase in circulating levels of interleukins and chemokines which then enter the brain by compromising the BBB. Infections of endothelial cells in the brain can disrupt the integrity of tiny capillaries causing leakage of blood and scattered blood clots and they have been spotted in a number of autopsies.

Another possible entry route of virus into the CNS is through the vagus nerve from infected lungs.[11] ACE-2 receptors are also expressed in non-neuronal cells in the CNS including astrocytes, oligodendrocytes, and endothelial cells. Possible route of entries of SARS-CoV-2 to the brain is depicted in Figure 1.

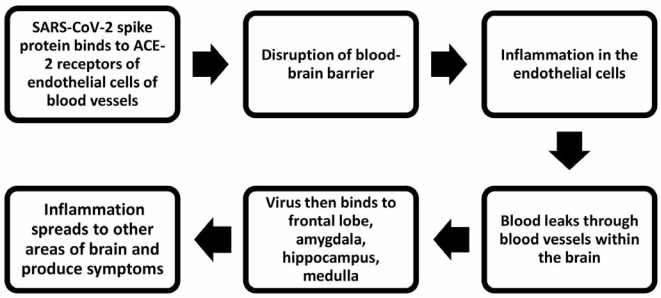
Fig. 1 Possible route of entry of SARS-CoV-2 to the brain



Role of Glial Cells in Neuropahology of COVID-19

Glial cells in the CNS, especially astrocytes and microglia, are the main defenders of the CNS. These cells play a significant role in CNS homeostasis. In addition, astrocytes also regulate the permeability of BBB through modulating the tight junctional areas in endothelial cells of blood vessels. COVID-19 systemic infections can also induce disruptive remodeling of BBB. Changes in BBB include loss of tight-junctional integrity, apoptotic death of endothelial cells, breakdown of glia, and increased vascular transport. This disruption of BBB also allows entrance of viral particles and causes further damage associated molecular patterns in the brain. The flow diagram of brain infections and inflammation is depicted in Figure 2

Fig. 2 Flow diagram of brain infection by SARS-CoV2

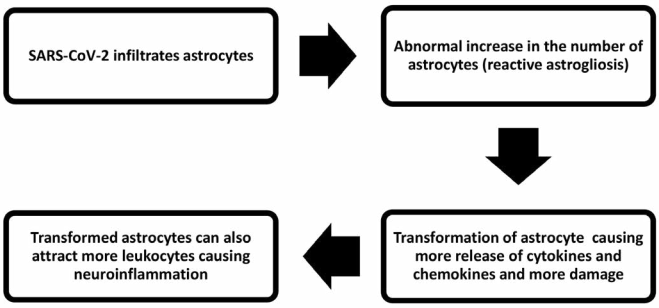


Microglia are innate immune cells in the CNS. They are the first responders of the CNS to injury, trauma, and systemic diseases. They are highly sensitive to peripheral metabolism and comorbidities. These cells cope with invading agents through phagocytosis and through release of pro-inflammatory cytokines. Microglia play a significant role in determining the outcomes of COVID-19 on brain pathology. Dystrophic microglia in the CVO can open the gate, causing more access of brain regions to the SARS-CoV-2 viruses.

Astrocytes and COVID-19

SARS-CoV-2 can infiltrate astrocytes in the brain. Astrocytes play a myriad of functions to support the functions of brain including providing a favorable environment to support replication of viruses. CNS insults caused by SARS-CoV-2 infections can trigger reactive astrogliosis,[12] a process that includes changes in the biochemistry as well as morphology of astrocytes.[9] Astrocytes, based on the type and the intensity of insult, can transform to a destructive phenotype causing release of more cytokines, chemokines, and several other neurotoxins to promote more CNS damage.[9] Transformed astrocytes can also serve as facultative antigen presenting cells to attract leukocytes, especially neutrophils and monocytes, to the affected areas causing further neuroinflammation.[13,14] The flow diagram of astrocyte infiltration by SARS-CoV-2 is depicted in Figure 3. Patients with COVID-19 who present with neurological symptoms most often have high level of glial fibrillary acidic protein (GFAP) in the plasma,[15] and this can explain that astrocyte activation may be involved in SARS-CoV-2 neuropathogenesis. Many believe that that the devastating neurological damage caused by SARS-CoV-2 is due to the result of systemic inflammation but not the consequence of viral infection of neural cells.

Fig. 3 Astrocytes infiltration by SARS-CoV-2



Neuroinflammation is the driving factor for several neurodegenerative disease and astrocytes play a significant role in the protecting the brain from infection and inflammation. Astrocytes are structurally and functionally important to maintain the integrity of blood brain barrier (BBB). Infection or activation of astrocytes may lead to disruption of BBB that can promote passage of toxic molecules and immune cells to the brain leading to more neuroinflammation. Disruption of BBB, neuroinflammation, and reactive astrocytes are generally the major causes of neurodegenerative and neuropsychiatric disorders.[16-18]

COVID-19 and Autoimmunity

Tissues in the nervous system are most vulnerable for autoimmune attack causing diseases, such as the multiple sclerosis (MS), Guillain-Barre syndrome (GBS) and autoimmune encephalitis (AE). Presence of antiphospholipid autoantibodies in some patients with COVID-19 indicate the possibilities of autoimmune response.[19] These autoantibodies may be the cause for coagulopathy and cerebral infarction that are frequently reported in patients with severe COVID-19.[1,4,19] In addition, several cases of GBS[20-22] and Miller-Fisher syndrome[23] associated with COVID-19 are also reported throughout the world.

Both astrocytes and microglia play a role in CNS autoimmunity by controlling autoantigen presentation, breaking down of BBB or blood-CSF barrier, autoantibody leakage, and autoantibody production from adaptive T- and B-cell activation.[24,25] A question may arise: Will patients with COVID-19 recovered from cerebral infarction and sepsis be more prone to producing autoantibodies making them vulnerable in developing autoimmune encephalitis? The answer is still not clear. More longitudinal clinical research would provide appropriate and specific information in this sense.

COVID-19 and Inflammation in the Brain

Immune response to the virus may explain the complications in the nervous system. Viral infection triggers inflammatory responses throughout the body. Exuberant flush of proinflammatory cytokines from the periphery and their transformation to inflammatory cytokines within the brain may be the reason for inflammation in the brain. One of the important immunological defenders are microglia and presence of activated microglial cells in the brain of individuals with COVID-19 has been documented.[26] The inflammatory reactions in the brain during the course of the disease might be the cause for disruption of brain circuits causing abnormal nerve cell communication and neurodegeneration.

Some patients with COVID-19 also exhibit signs of bleeding in the brain due to small blood vessel damage causing leakage of blood protein including fibrinogen. Presence of fibrinogen around brain tissue is associated with various neurological disorders. Clusters of macrophages have also been spotted in several areas in the brainstem including the respiratory center in some individuals who died with COVID-19. The presence of macrophages, activated monocytes, in brain tissue indicates chronic inflammation.

COVID-19 is not just a transient respiratory disease. Viruses of COVID-19 can infect other body systems producing symptoms that persist even months after disease. Although most symptoms resolve within few months some patients, "the long-haulers," may end up with myalgia encephalomyelitis/chronic fatigue syndrome (ME/CFS). Individuals experiencing ME/CFS are unable to do their usual activities and often get exhausted after performing even low level of functions; this is known as post-exertional malaise (PEM). In addition, some people with "long haul COVID" may end up with pain, dizziness, and problems thinking and concentrating, along with the fatigue.

COVID-19 and Neurological Symptoms

Neurological manifestations of COVID-19 can be due to the direct effects of virus on the nervous system or due to the systemic effects of inflammatory molecules associated with COVID-19. Based on 1 report, gathered from 125 patients with COVID-19,[27] 31 percent had altered mental status (encephalopathy, psychosis, dementia-like syndrome), 62 percent of patients had cerebrovascular events (ischemic strokes, intracerebral hemorrhages). Emotional detachment and psychotic breaks among COVID-19 survivors become a medical issue. Some patients also present with some strange neurological symptoms such as tremors, extreme fatigue, phantom smells, dizziness and bouts of profound confusion, a condition that is called "brain fog".

COVID-19 and Loss of Smell: The olfactory cells in the nasal mucosa are highly susceptible to viral invasion and get infected by SARS-CoV-2. This is why anosmia is one of the early main neurological symptoms in patients with COVID-19. A majority of patients with COVID-19 experience some level of anosmia and most often the symptom is temporary. About 19 percent of adults with COVID-19 report a loss of smell and this number rises to 80 percent in older patients over the age of 75. Based on other published research, olfactory neurons do not appear to possess ACE-2 receptors while supporting cells of these neurons have ACE-2 receptors. The precise cause of smell dysfunction is not clearly known. The changes in smell sensation in people with COVID-19 may not be due to the direct infection of olfactory sensory neurons but through infection of the supporting cells, called sustentacular cells. Damage of olfactory neuronal circuits is not permanent. Once the infection resolves, smell sensation is restored most of the time. This is possibly due to the regeneration of supporting cells from stem cells. Patients with COVID-19 typically recover their smell sensation over the months and the recovery is much faster than recovery of anosmia caused by other viral infections. One recent study revealed 40 percent of patients with anosmia regain their smell sensation after 6 months while 2 percent of patients did not show improvement.[28] During smell training, repeated short term exposures to smells can help patients to recover smell sensation. Four different scents that patients enjoy can be used to sniff for 20 seconds each and twice a day during smell training. This technique will not fix the problem immediately but over time, people may get benefits from this training.

COVID-19 and Loss of Taste: A loss of taste or smell or a reduction of these senses may be the early symptoms of COVID-19. Based on one meta-analysis, 53 percent of individuals with COVID-19 had problems with taste and smell.[29] Taste sensation is harder to assess as taste is subjective and most patients with COVID-19 perceive that the taste loss is secondary to the loss of smell. Some patients with COVID-19 reported difficulties in discriminating between sweet, sour, salty and bitter. Recovery of gustatory function is quicker than olfactory sensation.

COVID-19: Blood Clot and Stroke: SARS-CoV-2 infection also poses a risk of blood clots that may lead to stroke, heart attack, pulmonary embolism, and ischemic changes in other tissues and organs. Many patients present with cerebrovascular events during the acute stage of COVID-19 illness.[30-32] The pathophysiological mechanisms that underlie cerebrovascular events in patients with COVID-19 are not clearly known. Patients with COVID-19 have severe inflammation throughout the body that is, of course, based on severity of the disease. Inflammatory changes are also well documented in the endothelial cells of blood vessels in the brain. These cells are the source of a protein, called von Willebrand factor (VWF) which can induce intravascular clotting through activation of platelets. Intravascular clotting in the brain arteries can lead to

stroke. Inflammatory changes in the endothelial cells also can cause leakage of blood to the brain tissue. Therefore, individuals with COVID-19 have increased risk of both ischemic and hemorrhagic stroke. The risk of stroke is greater in individuals who are severely infected and have pre-existing vascular risk factors.[33] Reports show that 1.4 percent of individuals with COVID-19 had a stroke; most (52.7 percent) are ischemic and 45.7 percent had a bleed. The risk of ischemic stroke during the course of COVID-19 is also higher in individuals with type 2 diabetes.

COVID-19 and Dementia: Altered mental status is common in patients with COVID-19 during severe infection, especially in those requiring management in an intensive care unit. This symptom predominates in older individuals and might be the reflection of an unmasking of latent neurodegenerative changes or other medical comorbidities. Most individuals survive the infection; there may be post-COVID consequences including declines in cognitive function and in quality of life particularly among individuals who were in severe stages of the disease. Several reports showed that patients with COVID-19 present with several neurological deficits, including memory impairment[34,35] and concentration problems. Frequently this presents as a state of confusion. Confusion and cognitive decline following infection might be due to neuroinflammation induced neurodegeneration. It has been reported that as many as 84 percent of patients with severe cases of COVID-19 experience both mental confusion and rapid mood changes after they recover. Autopsies of brains from deceased patients with COVID-19 showed multisite leakage of blood from small blood vessels in the brain; this may explain the damage or ischemic brain changes. Brain inflammation and mini strokes observed in patients with COVID-19 increased the risk in developing Alzheimer's disease and other types of dementia.

Large numbers of people who are hospitalized due to COVID-19 experience delirium. One study reported that 55 percent of 2000 patients with COVID-19 who were in ICU had developed delirium. The number of episodes of delirium has direct relationship to the incidence of dementia. A single episode of delirium can increase the risk of developing dementia later.[36] Presence of delirium can also accelerate the rates of cognitive decline in individuals with compromised cognitive functions.[37] There are 2 hypotheses to explain how delirium might lead to dementia: 1) Accumulation of toxic cellular trash which can cause long-term brain damage; 2) Persistent inflammation in the brain following infections which can trigger an acute episode of delirium and cause neurons, astrocytes, and microglia to deteriorate further causing further decline in cognition.

Some patients with COVID-19 also demonstrated emotional disturbances. The amygdala in the brain is considered the seat of emotions. An olfactory bulb that is infected with virus in individuals with COVID-19 is located near to those brain areas involved in memory and emotional functions and this could explain why individuals with COVID-19 present with "brain fog" and strange emotional disassociation.

COVID-19 and psychiatric disorders: 20 percent of individuals diagnosed with COVID-19 receive a first-time psychiatric diagnosis within the first 3 months of becoming infected. These include anxiety, depression, mood changes and insomnia. Diagnosis of conditions that include dementia is also common in patients after COVID-19 illness. Moreover, patients with existing psychiatric problems might be more prone to get infected with SERS-CoV-2. The causes of new psychiatric problems are not well known. One possible explanation may be disruption of neuronal circuits in the brain secondary to neuroinflammation. New research is suggesting that there may be long-term neurologic consequences in those who survive COVID-19 infections.[38] Troubling evidence shows a mild brain damage occurs in many survivors that causes subtle cognitive, behavioral, and psychological problems.[39]

COVID-19 and sleep problems: Some patients who survive COVID-19 but present with long-term symptoms experience insomnia. The disease, which affects the central nervous system, has been inducing a multitude of symptoms in those who have recovered, including brain fog, changes in attention, headaches, and most often, insomnia. Now the question may arise whether COVID-19 can induce changes in melatonin. Melatonin is a hormone secreted by the pineal gland and its secretion is influenced by the light and dark cycle. During the dark phase (night time), melatonin secretion is highest while during the light phase, the secretion is low. This pineal hormone can act as anti-inflammatory, anti-excitatory, anti-oxidant, sleep initiation and immunoregulator.[40-42] Melatonin has anti-viral properties.[43] Melatonin is known to be an anti-inflammatory agent that may be able to counter the systemic inflammation seen in patients with COVID-19. Exogenous melatonin can be beneficial in critically ill patients via reducing vessel permeability, inducing sedation, decreasing agitation and increasing sleep quality. These beneficial properties of melatonin may highlight the outcome of COVID-19. Is adequate sleep the answer of good COVID-19 outcomes? The answer is possibly "yes."

Haphazard inflammation during and post COVID-19 has been hypothesized to cause myalgic encephalomyelitis. Prolonged low-level oxygen deprivation as well as inflammation of brain tissue during the disease can cause cascade of neurochemical changes leading to alter the functions of neural networks. Myalgic encephalomyelitis during COVID-19 is poorly understood. Sufficient sleep has been suggested to minimize the risk of developing myalgic encephalomyelitis following COVID-19 infection.

COVID-19 and chronic fatigue syndrome: Myalgic encephalomyelitis/chronic fatigue syndrome (ME/CFS) is a serious, long-term illness that affects many body systems. People with ME/CFS are often not able to do their usual activities. At times, ME/CFS may confine them

to bed. People with ME/CFS have severe fatigue and sleep problems. ME/CFS may get worse after people with the illness try to do as much as they want or need to do. This symptom is called post-exertional malaise (PEM). Other symptoms can include problems with thinking and concentrating (brain fog), pain, and dizziness.

Most Frequently Asked Questions

Can COVID-19 cause neurological insult and disease?

While cause and effect has not been established, some patients with COVID-19 present with a variety of symptoms caused by neurological insults. These can remain even after initial recovery or can develop later as a consequence of the disease. The most common symptoms are loss of smell and taste sensation. In most patients, theses senses come back over time. Some patients with COVID-19 also present with headaches, myalgia, fatigue, sleep disorders, depression, and anxiety.

How long do neurological symptoms from COVID-19 last?

Several factors impact the longevity of symptoms. In general, symptoms stay for longer duration in older patients as well as in patients with comorbid conditions. Of course, the duration is not known for all neurological symptoms. On average, loss of smell and taste sensation lasts 2-3 weeks in most patients while in others, this can last for months.

If patients lose their smell and taste sensation, will they come back?

Based on research, 95 percent of the patients with COVID-19 recover their smell and taste sensation eventually. Initially, the thought was that olfactory neurons are infected directly by the virus and produces symptoms but now, agreement is that the virus infects the helper cells but not the neurons. As the helper cells recover their functions, smell sensation comes back in most patients. This is one of the reasons why patients with COVID-19 get back their sensation of smell and taste over time following COVID-19.

Why do patients with COVID-19 present brain fog?

Brain fog is not a medical diagnosis but used to describe how the individuals feel when their thinking is slow, sluggish and fuzzy. Brain fog in patients with COVID-19 is a term used to describe the feeling of being mentally slow and fuzzy. Patients who are severely deconditioned and present PTSD-like syndrome during the active stage of the disease may develop post COVID-19 brain fog.

What causes brain fog?

As stated, SARS-CoV-2 is neuro-invasive; infection can lead to encephalopathy. When inflammation spreads to brain tissue, it hinders the ability of neurons to communicate with each other in the brain. This may be one of the explanations for "brain fog." There are several other likely contributing factors such as poor sleep quality, stress and anxiety, depression, and side effects of certain medications.

How long does "brain fog" persist?

Lingering "brain fog" is one symptom that individuals with COVID-19 report; there is lack of clear understanding how long brain fog may last. Some patients report brain fog lasting for weeks and months after the respiratory symptoms disappear.

What should patients do if "brain fog" is experienced during and post-COVID-19?

The best management strategies for brain fog have been found to include: a) having good quality sleep; b) eating a well balanced, healthy diet with plenty of water; c) avoiding drinking alcohol; and d) exercising regularly to boost brain functions.

What is the probability of stroke in patients with COVID-19?

COVID-19 may increase the risk of ischemic stroke possibly due to inflammation and hypercoagulation. As per one published paper in stroke and vascular neurology journal, a group of researchers have suggested that 4.9 percent of patients with COVID-19 had acute ischemic stroke during initial hospitalization.[44] Increased risk of ischemic stroke is thought to be due to multiple factors including increased levels of fibrin D-dimer, erythrocyte sedimentation rate (ESR), and lactic acid dehydrogenase.

Can patients with COVID-19 develop Alzheimer's disease later in their life?

Developing Alzheimer disease depends on multiple factors; age, severity of infections, comorbidities. Many patients who have recovered from COVID-19 have reported experiencing confusion, decreased attention span, inability to concentrate, and short-term memory loss. Several researchers pointed out the long-term impact of COVID-19 could include an increased risk of Alzheimer's disease and other forms of dementia.[45]

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Nutritional Concerns in Post-Acute Care Recovery of Older Adults

by Harold Merriman, PT, PhD, CLT and Jacob T. Mey, PhD, RD

Introduction to Post-Acute Care and Recovery

A patient with an underlying chronic condition(s) faces additional challenges after being discharged from the hospital. This is true regardless if the discharge setting is to an inpatient rehabilitation facility (IRF), a skilled nursing facility (SNF), outpatient, home health or hospice. In fact chronic conditions can be the major determinant in deciding the appropriate discharge destination. For example, a patient who was hospitalized for bilateral pneumonia, but who had a major stroke 1 year prior with significant residual functional deficits, could well need a longer time for rehabilitation to regain the functional activity status present just before hospitalization than a comparable patient who did not have an underlying stroke.

After the age of 60, individuals show an average loss of ~1 percent muscle and ~3 percent strength per year. This loss is not linear but is exacerbated with periodic bouts of reduced physical activity and muscle disuse as found during an acute-care stay.[1] One week of bed rest even in healthy young males (age 23 $\pm$ 1 yr) can cause significant loss of leg muscle and strength.[2] This leg muscle loss is even more pronounced in healthy older adults (age 67 $\pm$ 2 yr) reaching ~4 percent after the same length of bed rest.[3] This leg muscle loss is not prevented if older adults walk 2000 steps/day for 3 consecutive days before enduring 1 week of bed rest.[4]

Unfortunately, a short-term period of inactivity as seen in an intensive care unit (ICU) can lead to significant negative long-term effects. ICU-acquired weakness (ICU-AW) is defined as bilateral symmetrical limb weakness and is associated with respiratory muscle weakness and prolonged mechanical ventilation in an ICU.[5] One study showed that patients (median age 45) with acute respiratory distress syndrome (ARDS) who survived an ICU stay (median, 25 days) showed persistent functional mobility deficits at 1 year post-discharge in regard to their 6 minute walk test (6MWT) time of 422 m versus the normal age-matched score of 600 m.[6] A more recent study by Hermans et al. assessed muscle strength in older adults (mostly age $\geq$ 60) who were present in the ICU for at least 8 days. Subjects were classified into weak or not-weak cohorts using the Medical Research Council Global Strength Tool. The 1-year risk of death after ICU admission was found to be dependent on the persistence and severity of weakness at ICU discharge.[7]

These findings highlight the extreme detrimental effects of even short periods of inactivity in older adults, which can have a long-lasting negative impact on their functional mobility and regaining the prior level of function (PLOF). When the periods of inactivity are prolonged, for example as with COVID-19 requiring lengthy hospitalizations and/or quarantines, the harmful effects can be even more pronounced.[8]

Poor Nutrition – Compounding the Negative Effects of Acute Care

Combatting these detrimental effects on muscle mass and function is of utmost importance to optimal patient care. Suboptimal dietary intake or outright malnutrition has the potential to not only blunt physical therapy efforts, but may even exacerbate chronic conditions and accelerate the loss of muscle mass and strength after transitioning out of the acute-care setting. Utilizing interdisciplinary approaches to positively impact nutritional status, such as consulting with registered dietitians (RDs), may improve patient outcomes and recovery goals.

This is due, in part, because loss of skeletal muscle mass and function is multifactorial and a combination therapy involving both diet and exercise may be required for optimal recovery.[9] Physical therapists should be aware of primary nutritional concerns to both identify and address nutritional needs of patients.[10] Physical therapists can have a particularly substantial impact in the post-acute care settings, as dietetic staff in such facilities may be limiting. For example, the Centers for Medicare and Medicaid Services (CMS) requires only one RD be staffed at Long-Term Acute Care (LTAC) facilities. As such, RDs often cover multiple patient units or may have limited hours within the facility.[11] Feedback and communication with interprofessional members of the care team (relevant to this discussion, between PTs and RDs) is therefore an essential part of patient care.

Physical therapy (PT) practice in acute care is diverse which matches the wide variety of patients' conditions and needs. However, this PT practice can be broadly summarized as identifying and managing patient limitations in function, patient education, and discharge planning.[12] The PT goal is often to restore the patient to the PLOF, though in some cases this will not be sufficient to provide for a safe discharge. Additionally, many other factors come into play including the patient's current medical condition, social/family support, living environment, finances/insurance, and motivation to participate in PT.

Many studies have confirmed the benefits of exercise and mobility during a hospital stay of an older adult. In

fact, there is no pharmacological intervention that can prevent or reverse the functional decline so frequently seen in the hospital setting.[13] The functional decline that is observed during a hospital stay can be termed hospital-acquired functional decline (HAFD).[14] Early mobilization and exercise has been shown to benefit critically ill patients in the ICU, older adults with a variety of acute conditions, as well as hospitalized older adults with heart failure who then also continued outpatient and home exercises.[15-17]

Nutrition roles for the PT in post-acute care setting: screening for nutritional risk.

Despite research and clinical efforts, malnutrition remains a prevalent and under-identified issue. Screening for malnutrition is an initial and pivotal step in the process to provide optimal nutritional support for patients. Screening can be conducted by any member of the healthcare team – although there is no gold standard screening tool, several validated questionnaires are available, including common tools such as the Malnutrition Screening Tool (MST), Malnutrition Universal Screening Tool (MUST) or Mini Nutrition Assessment-Short Form (MNA-SF).[18] Check with your facility for their preferred malnutrition screening tool. Notably, this should be shared with the RD for additional assessment and implementation of a dietary regimen. Further, the PT can stay alert for nutrition-impacting changes in physical or mental function including poor dentition, difficulty swallowing, weight loss over time, declining physical or mental function.

Nutrition and diet screens is an area that is definitely within the PT scope of practice and can be administered during the patient history. This can be part of assessing the patient's general health status which can include measuring a patient's body mass index (BMI) and waist circumference. Additionally, it is important to ascertain a patient's general readiness to change nutrient/dietary habits and their confidence, or self-efficacy to make such changes.[19] In additional to the above-mentioned screening tools, asking patients about their nutrition (e.g., Can you tell me what you eat on a normal day?) can be an effective tactic to gain knowledge about the patient's nutrition habits and be useful information to share with the RD.

Nutrition roles for the PT in post-acute care setting: providing general nutrition education.

In addition to nutritional screens, PTs are allowed to provide general nutritional education. For example, the PT can share well-established government and academic guidelines found in the public domain.[18] These could include the United States' My Plate, Canada's Food Guide (water is the beverage of choice, shows actual pictures of food) and Harvard University's School of Public Health Healthy Eating Plate (water is the beverage of choice).[20-22] Also, PTs should familiarize themselves with national guidelines for healthy dietary patterns, such as the United States Department of Agriculture's (USDA) Dietary Guidelines for Americans (DGA). The DGA are critical resources for health professionals. They are published every 5 years and provide updated food-based recommendations to promote health, help prevent diet-related chronic diseases, and meet nutrient needs across the lifecycle.[23]

PTs should ensure the nutrition guidance they provide aligns with these evidence-based nutrition recommendations. Importantly, PTs should refrain from recommending personal nutrition beliefs especially those that have not breached the critical evidence threshold required to be present and recommended in these national guidelines. Examples for poorly-evidenced nutrition topics are gluten-free diets, non-GMO (genetically modified organisms), organic produce or grass-fed beef, and the use of herbal or botanical supplements.

In contrast, examples of strong and appropriate general nutrition information could include advocating that the patient eats more home-cooked meals, focus on quality proteins in each meal, and consuming adequate fruits, vegetables, and fiber. Particularly important to the post-acute care setting are protein intake, calorie intake, and hydration.

Protein intake recommendations. Encourage patients to consume a variety of protein foods across the day, and at least 1 in each meal, including seafood, lean meats and poultry, eggs, legumes (beans and peas), nuts, seeds, and soy products. Additionally, including dairy at meals may increase protein intake, and can come from milk, yogurt, cheese, and/or fortified soy beverages. Notably, emerging evidence suggests older individuals may benefit from protein intake beyond the general recommendations – this information should be discussed with the patient's dietitian and physician to determine if increasing protein recommendations is warranted.[24]

Calorie intake recommendations. Specific calorie goals should be reserved for nutrition and dietetic experts, however, all older adults can be encouraged to follow a healthy dietary pattern. A healthy dietary pattern includes fruits, vegetables, grains, dairy, proteins, and oils while limiting saturated or trans-fats and added sugars. Also, older adults are susceptible to food borne illness, so providing additional information on food safety may be beneficial (see Appendix 14 in the Dietary Guidelines for Americans, www.dietaryguidelines.gov).[25]

Importance of hydration. A key general recommendation is shifting away from sugar-sweetened beverages towards nutrient-dense fluids, such as milks or juices within a healthy dietary pattern or water to meet additional fluid needs. Although the DGAs do not suggest a specific fluid intake recommendation, the Institute of Medicine has recommended fluid intake to prevent dehydration for adult men (3 liters or 13 cups) and women (2.2 liters or 9 cups), which should be consumed as beverages each day.[26]

It should be noted, this information is shared for the purpose of promoting wellness and general health, instead of treating or managing a specific disease. Patient-specific

recommendations by dietitians or physicians may differ from these guides for a variety of reasons that are beyond this scope of this article.

PTs are well positioned to support patient behavior change to help actualize beneficial changes. It can be very challenging for anyone to adopt and then to sustain a healthy eating pattern. Effective methods to support the patient can include discussing their readiness to change and then to follow up with the appropriate information on the benefits to change and/or motivational interviewing. The PT can then work with the patient to established specific, measurable, action-based, realistic, and time-bound SMART goals.[19] These strategies can build self-efficacy and convert extrinsic motivation into intrinsic motivation to support a change in eating behaviors.[27]

Beyond food and beverages – the potential benefits of dietary supplements.

Nutrition needs should be met primarily through food. However, in some cases fortified foods or dietary supplements may help meet nutrient needs. Several dietary supplements are provided below, not for overt recommendations, but rather to encourage communication and discussion amongst the interdisciplinary team to determine the best approach for each individual. Supplemental protein and calories, often in the form of pre-mixed beverages (such as Ensure, Boost, etc.) may be useful to help patients meet protein and energy needs during recovery and in combination with physical therapy. These supplements come in a variety of formulations to meet specific patient needs (e.g., high protein, high calorie formulations to promote protein intake and weight gain versus high protein, low calorie formulations to promote protein intake and weight maintenance or weight loss). Creatine is formed endogenously and acquired exogenously from consumption of meats, or through supplementation. Supplemental creatine improves muscle size, strength and accentuates adaptations to resistance exercise – a core therapeutic for low muscle mass and strength. Creatine is safe and effective for older adults and may be a warranted consideration for recovery plans.[28-31]

The steroid hormone Vitamin D is another example of an essential nutrient that older adults need to carefully monitor and potentially supplement. Older adults produce less Vitamin D in their skin and kidneys which can lead to Vitamin D insufficiency or deficiency particularly in individuals who are overweight/obese (fat-soluble Vitamin D is sequestered in fat) or who have darker skin (increased melanin blocks Vitamin D synthesis). Throughout the world, Vitamin D deficiency and insufficiency in all ages vary between 30 percent to 80 percent. Vitamin D is not only critical for optimal bone health (along with calcium) especially in post-menopausal women but is closely related to the occurrence and development of many chronic conditions such as cardiovascular disease, cancer, Type 2 diabetes, and infectious disease.[32] In relation to muscle mass and strength during recovery, low vitamin D status is associated with increased risk for sarcopenia (low muscle mass and function).[33] However, a systematic review of interventions to increase vitamin D status have yielded inconclusive results, trending towards a null effect on muscle health.[34] Relevant to the COVID-19 pandemic, it appears that low Vitamin D levels are associated with an increased risk of developing severe COVID-19 infection.[35] Recently, Vitamin D treatment (specifically calcifediol also known as 25-hydroxyvitamin D3) has been significantly associated with lower in-hospital mortality during the first 30 days in patients who are hospitalized with COVID-19.[36] Taken together, it is important for older adults to consult with their dietician and physician to determine if their Vitamin D levels are within normal ranges and whether or not supplemental vitamin D should be considered as part of their specific treatment plan.

Summary

For optimal patient care, it is important for PTs to address the nutritional concerns of their patients which is especially true for the older adult in the acute care and post-acute care settings. PTs should be encouraged screen for malnutrition and also to advocate for their patient's nutritional needs. This is effectively accomplished through an interdisciplinary approach incorporating the expertise of RDs. The role of a PT in a patient's nutritional care may include administering nutrition and malnutrition screens, providing general nutrition education, and supporting healthy behavioral change. These functions remain within the PT scope of practice; specific nutrition or dietary advice to treat a medical diagnosis should be reserved for dietetic or physician members of the care team. Through interdisciplinary communication and placing a focus on a patient's nutritional needs, PTs can advance their important and positive impact on patient care in the post-acute setting.

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Person of Person-Centered Care

Addressing Physical Activity/Exercise Participation Through Psychosocial Factors and Messaging Therapy

by Susan Wenker, PT, PhD and Jeanne Duncan, PT, DPT

Understanding patients' and clients' perceptions around physical activity and exercise is the first step in meeting their physical therapy needs. We want to know where they have been, where they are at today, and where they see themselves in the future in relation to why we, as PT's and PT assistants, are seeing them. We are privileged to be a part of their lives for a short time. Sometimes that duration is in days, sometimes it is measured by months, and still other times it may be down the road when they return to see us with new needs that arise in the future. Yet, in the big picture, we are a small but hopefully impactful piece of their lives.

Psychosocial Considerations

One way to improve the understanding of ageing patients is to appreciate the psychosocial issues of ageing. Many things can affect ageing adults that in turn affect their values and internal desire to participate in exercise or physical activity. Let's start with the consideration of loss, grief, and loneliness.

Loss can occur throughout the lifespan: loss of a significant other, a loved one, pets, a home, and potentially physical abilities. However, loss and the grieving process vary greatly across not only individuals but cultures. For example, a high degree of resilience can mitigate loss in the grieving process. Resilience has been found to moderate stress and improve adaptation to change, and has been associated with successful ageing. Additionally, the presence of mental or physical impairments may promote higher levels of resilience, especially when a strong social support is present. However, a strong social support varies among cultures. Some cultures use a wide net of social supports, ranging from immediate family, close friends, and acquaintances to societal support such as support groups. Other cultures may choose to engage with family first, reaching out to others only as needed. Therefore, when an older adult shares that they have experienced loss in their life, therapists need to be mindful that the patient may or may not need additional supports. Additionally, the emotional support may be provided in conjunction with or before physical therapy interventions.

Patients may also live alone following the loss of significant others. However, we should not assume a person is experiencing loneliness just because they are alone. Older adults may have coping strategies consisting of positive social support, met housing needs, and a financial safety net to continue engagement in activities of their choosing. Risk factors to be aware of regarding loneliness can include living in a rural environment, living in more isolated areas, and potentially negative social supports.

Life transitions can also impact individuals differently. A typical life cycle used to be going to school (through twelfth grade or beyond), marriage, going through child-rearing years, and then retirement. This cycle has changed for a variety of reasons; therefore, life transitions may occur earlier, later, or be repeated. Take for example retirement. Retirement may be a choice, but they may experience grief and loss of identity once the person is over the "sugar rush" that can occur in the early phase of retirement. Other retirees may engage in different activities and continue to flourish in this next chapter of their lives. Another example of a transition is child-rearing. An ageing adult may experience an empty nest for a period. Unexpectedly, their child(ren) may return home and, at times, with grandchildren or significant others. Adapting to these changes can be quite challenging as new terri-

Table 1. Types of Intimacy

Types of Intimacy	Definition
Emotional Intimacy	People confide and connect in sharing their joys and fears
Intellectual Intimacy	When you're discussing with others what you think and feel about certain topics
Physical Intimacy	Includes physical touch such as hugging or placing a hand on someone shoulder for comfort or acknowledgement.
Experiential Intimacy	When people enjoy activities together such as hiking, biking, or even traveling and taking vacations
Spiritual Intimacy	The feeling of connectedness through a higher entity, maybe a person, a spirit or something else

tory is explored with changing roles, responsibilities, and potentially financial stressors.

Last, let's think about sex and intimacy. First recognize that older adults continue to have sex. Sexuality is a core dimension of life throughout the lifespan. Physiological changes including dryer vaginal tissue and impotence can create a sense of loss and grief which can lead to creating other types of intimacy. For example, emotional intimacy is where people confide and connect in sharing their joys and fears. Table 1 defines several types of intimacy, relative to psychosocial issues. An increased awareness of the potential implicit and conscious bias you may have when working with older adults will facilitate keeping an open mind to a patient's particular life circumstance.

Social Determinants of Health

When working with older adults, Social Determinants of Health (SDoH) are additional factors to consider. SDoH are defined as non-medical factors that influence health outcomes including the broad categories outlined by Healthy People 2030: education access and quality, health care access and quality, neighborhood and built environment, social and community context, and economic stability.6 We are better able to connect with patients if we understand the benefits and barriers that SDoH may impose on a person. By now, most if not all, PTs and PTAs have a heightened awareness of SDoH. However, integrating the benefits and barriers into a patient's care may not come as natural.

Consider 2 examples: Marial is an ageing adult who presents with low back pain. She reports a back injury 20 years ago and the back pain comes and goes. When Marial presents to PT she reports that at her job, she stands for up to 4 hours a day without a break and her back starts to hurt worse by the end of the day. She wears well-worn shoes to the appointment and indicates these are the same shoes she wears at work. You recommend Marial purchase a shoe that is higher priced but offers good arch support and cushioning. Should Marial be able to afford the recommended shoes, she may feel relief of her symptoms, and be more prepared to engage in other recommendations. Should she continue with the current footwear, she may feel depressed and less interested in participating in other activities because of fatigue, being in pain, and potentially emotionally exhausted.

Example 2 involves Jordan. Jordan has worked in construction for 25 years. A single parent, Jordan has the benefit of having a job and most likely health insurance. However, we do not know what would happen if Jordan falls ill and is unable to work. Do they still have that same insurance coverage given their trade? Is Jordan's insurance based only on hours worked? If so, what happens if they cannot fulfill those hours? Will they lose insurance coverage for a time period, and how does that affect their access to health care? Will answers to these questions affect a physical therapy plan of care?

These examples are simplified to introduce the complexities of providing care when a therapist integrates the "whole" person into the plan of care. These examples relate to downstream, or local, barriers and interventions. Yet, PTs and PTAs, need to continue to think broader to upstream effects, asking the question "What would need to occur so that the barriers no longer existed?" Finding answers to these questions will move the needle toward improved health outcomes.

Self-Determination Theory

Multiple theories can be applied to patient centered physical therapy practice in order to engage the patient in their care, including Bandura's self-efficacy theory and the Transtheoretical of Change Theory. However, we are going to focus on the self-determination theory and the ways in which theoretical concepts can be applied to patient care.

The self-determination theory is a theory of personality development and self-motivated behavior change. The central principle of the self-determination theory is that you move toward autonomy where a person's values align with the interventions and goals. Table 2 provides an overview of the theory where a continuum of autonomy exists ranging from the least autonomous perspective which is driven by external motivation to the most autonomy when a person will possess internal motivation.

In the self-determination theory, individuals may feel that they are controlled by others, referred to as external regulation, and that they're being rewarded and punished by external forces. One such example includes the rationale that if you exercise and meet your expectations then you can reward yourself with an ice cream cone. Introjected regulation is controlled by internal self-esteem related issues and the person imposes pressures on themselves

Table 2. Continuum of Autonomy

Presented from least amount of person autonomy to most amount of autonomy

- External motivation
  - » External regulation (controlled by others, rewards and punishments)
  - » Introjected regulation (controlled by internal self-esteem related issues; person imposes pressure on themselves feeding either same or pride-depending on their behavior)
  - » Identification regulation (acceptance of behavior as being important to achieve personally valued outcome)
  - » Integrated regulation (identifies with the regulation and coordinates that identification with core values and beliefs)
- Internal motivation

by either feeling shame or pride depending on the individual's behavior. An example of this regulation is the positive self-talk a person provides when they complete the exercise but talk or feel negative thoughts if they do not exercise for a day and berating themselves as "lazy." Next on the continuum is identification regulation. In this state a person accepts the behavior as being important and values it, although they are not always interested in participating in behaviors that will accomplish their goals. An example is when a person wakes-up in the morning, understands a short walk would be beneficial, yet they choose to stay in bed until it is too late to go for a walk. The highest level of regulation is integrated regulation, often known as internal motivation. Here the person fully internalizes the values and interventions to achieve the desired behavior. Clients, in the clinic setting, may not be demonstrating motivational tendencies that are straightforward. There will most likely be a combination of both internal and external motivation. As providers we should find ways to help support and guide patients to the highest degree of internalization and integration of motivation to make behavior change. If this occurs, potential for the patient to actively participate and continue with the plan of care to ultimately meet their goals becomes more likely.

Research has shown that individuals are more motivated and engaged when these 3 psychological needs are met. (1-5) First, competence: the person needs to believe that they are capable and would be effective in implementing the actions for the desired change. Second, autonomy: the client needs to feel their behavior is freely chosen or volitional rather than imposed upon by external forces. And lastly relatedness: a sense of belonging or connectedness to others in social relationships that are supportive is needed.

Clinically, how do we support our patients and create an environment that will optimize patient engagement, empowerment, and success? First and foremost, we need to get to know patients by asking them questions, to understand and identify benefits and barriers to therapy based on their individual psychosocial issues and social determinants of health. This way we will be more likely able to support our patient's individual needs. Let's look at these 3 psychological needs and discuss our role as a clinician.

For patients to feel competent in their ability to implement the actions or behaviors to change, we must first help the patient develop reasonable and clear expectations by providing education and forming individual realistic goals. As a clinician, we may need to guide clients into scaling down their long-term goals into smaller doable or short-term goals. This can help them feel competent in taking that first small step. Regardless how big that first step is, just starting may provide the person with positive feedback, encouragement to continue to engage in the behavior, and confidence that they can do it. Providing constructive and positive feedback, while celebrating small successes can encourage ongoing change.

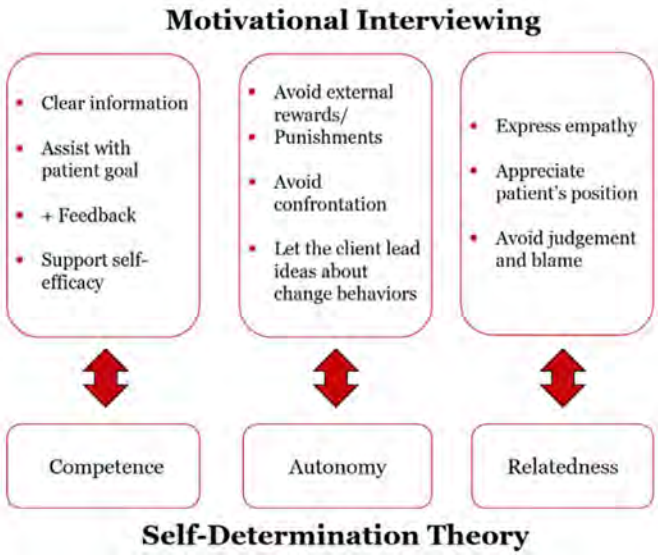
Patient autonomy is supported when allowed choices in their care. However, those choices should and need to be informed choices. Patient education and understanding is key. Clinicians also need to support choices even when those choices may not be the most effective or what we would have recommended for the patient.

Finally, to support relatedness, patients should feel we are genuinely interested in their well-being, that we understand the difficulties and challenges that they may encounter with change, acknowledge their perceptions, and provide support in their plan without judgment. Subjective interviewing skills and development of patient rapport is highly important to support this psychological need. Demonstration of active listening, empathy, and treating them as an individual and not a diagnosis is important.

Motivational interviewing is a well-known and well-adapted style of counseling to help facilitate behavioral change. Therapists may associate motivational interviewing with health-related changes like tobacco cessation, but it can be utilized in many other aspects of behavior change. Motivational interviewing first assesses the patient's readiness to make the change to facilitate change.

Motivational interviewing and the self-determination theory have several similarities. See Figure 1. The concept of competence in the self-determination theory relates to ensuring clear information, assisting with goal creation and providing that positive feedback seen in motivational interviewing. Autonomy is related to avoiding external rewards and punishments and allows for the patient to lead, and relatedness includes expressing empathy and avoiding judgment on our patients.

Figure 1. Motivational Interviewing and Self-determination Theory



Application

The links to the right are video examples of patient interviews. One we will refer to as the traditional strategy and the other a patient empowerment strategy. In the traditional strategy, we have chosen to take a PT-centered approach, focusing on the PT being the expert and driving the course of care. While goals are identified, they may not be fully integrated by the patient. We will see judgment on the part of the patient due to what is perceived to be non-compliance.

In the empowerment strategy, the patient is seen as the expert in their care and leads the plan with the support of the clinician. Strategies, including coaching, self-determination theory and motivational interviewing to empower the patient for the desired behavioral change, are modelled. The patient scenario in both videos is identical with the patient presenting to PT through a video visit for their first follow up session after an initial evaluation. She is a single mom, construction worker, raising 2 children.

In reviewing these videos, consider the overall aim of patient empowerment and engagement. PTs and PTAs can transition from provider-directed knowledge centric care to a patient-centric approach. Knowledge about the person, the condition, and the movement system is used to guide a patient toward improved health outcomes. The first video is an example of the PT centric model of care while the second video provides examples of ways to connect with your patient. This approach may take longer early on in the therapeutic relationship yet will intentionally support the patient toward more positive health.

As you treat patients, continue to reflect-in-action about the person's needs, body language, and story while comparing that information to the patterns you recognize and the tests and measures that YOU think are important. Be adaptable to change as you listen to the story to better meet their needs. Key points of the two approaches are summarized in Figure 2.

Figure 2. Comparison of Traditional and Empowerment Strategies

TRADITIONAL	EMPOWERMENT STRATEGIES
• PT-centered	• Coaching techniques
• Judgement by PT of patient "noncompliance/ nonadherence"	• Self Determination Theory
• Goals identified but not always integrated	• Motivational interviewing
• Expert content perspective	• Self-efficacy
	• Patient as expert

Traditional Strategy Video -- Watch now!

Patient Empowerment Video -- Watch now!

Research

Rethorn and Pettitt completed a systematic review of randomized controlled trials published in 2019 regarding health coaching by PTs.[5] Eleven trials meeting inclusion criteria consisted of participants 18 years and older using 2 groups for analysis; one group received coaching interventions delivered by a PT and a second group received usual care. Outcomes in 3 domains were analyzed: behavioral, physiological, and psychological. Authors concluded results were varied between groups when PTs provided health coaching strategies. Variability may exist due to lack of consistent measurement methods within the 3 domains, small number of trials, and limited number of studies to review. Given the potential benefits of applying the self-determination model to PT, additional research could be valuable in changing how PTs approach the patient interview.

Conclusion

Providers have the skills necessary to provide patient-centered interviews which can lead to improved health outcomes. Additional training may be beneficial to develop this skill. Training opportunities are found on the National Board of Health and Wellness Coaching website.

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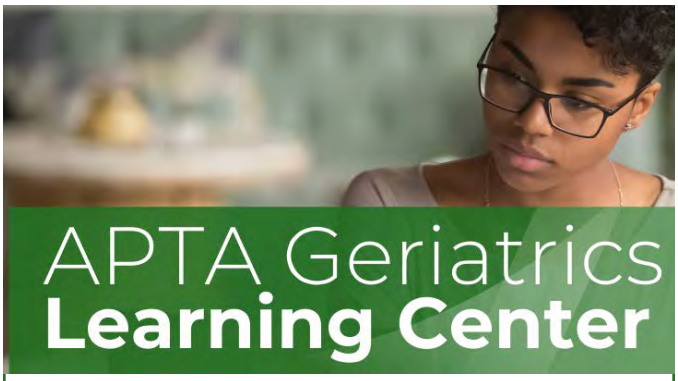

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It's all About Function

Outcome Measurement When Dementia is in the Diagnosis

by Christy Ross, PT, DPT and Trevor Mahoney, PT, DPT

Editor's Note: This clinical case commentary was part of content for the November 2021 Journal Club. These case studies are intended to demystify the more formal statistics and format of a peer-reviewed article and translate key concepts into clinically usable information. Join us for Journal Club on the third Tuesdays of January, March, May, July, September and November at 8 pm ET to discuss current concepts with a wide range of peers.

Case study presentation based on the research article from Journal of Geriatric Physical Therapy: McGough EL, Lin SY, Belza B, et al. A Scoping Review of Physical Performance Outcome Measures Used in Exercise Interventions for Older Adults with Alzheimer Disease and Related Dementias. J Geriatr Phys Ther. 2019;42(1):28-47. doi:10.1519/JPT.0000000000000159

Neurologist Initial Evaluation

Ms. Bach, a 79-year-old female, has experienced chronic pain issues for most of her life. She had been historically diagnosed with fibromyalgia, depression, and anxiety for which she was prescribed tramadol for pain relief, and clonazepam for anxiety by her primary care provider (PCP). Multiple instances of falls have been reported, usually described as "trips" and not being able to catch herself and regain her balance. Her past medical history is also remarkable for valvular heart disease, hypertension, and a "small stroke" (per PCP description to family) in July 2019. Following Ms. Bach's stroke, family support for her was increased. She now presents to an outpatient neurology clinic for cognitive changes described by her daughter as repeating questions, misplacing items, and having difficulty managing complex tasks.

Further interview noted that following the stroke, there was onset of a stepwise progression of cognitive changes and functional abilities. Two months later, she had become more sedentary, minimizing her social and community activities. Additionally, she has experienced 1 episode of visual hallucination.

Neurocognitive assessment revealed a Montreal Cognitive Assessment (MoCA) score of 16/30 with deficits among executive function/visuospatial, naming, digit span, serial subtraction, delayed recall, and abstraction.

Neurologic examination was essentially non-contributory, with mild left upper extremity cogwheel rigidity, and unsteady antalgic gait due to report of back pain.

Imaging via MRI was obtained and concluded that Ms. Bach has mild generalized volume loss, hippocampal volume at the 27 percentiles when compared to age matched normal controls, a multiple microinfarcts, moderate cerebrovascular small vessel disease as indicated by white matter hyperintensities, multiple lacunar infarcts, and remote left posterior cerebral artery distribution cortical infarct.

The neurologic evaluation, along with history of valvular heart disease, hypertension, step wise progression of cognitive decline within 3 months of cortical infarct, identified family history of dementia (mother) and

cardiovascular disease (both parents), imaging consistent with cerebrovascular small vessel disease, history of falls, and the presence of completely intact orientation on the MoCA suggests non-amnestic (i.e., non-Alzheimer) memory dysfunction. There is also suggestion of Lewy Body Dementia due to the single episode of visual hallucination. The hallucination may be in part due to a cortical infarct in the posterior cerebral artery distribution and history of macular degeneration (Charles Bonnet Syndrome). Although age and MoCA neurocognitive profile may be consistent with Alzheimer's disease, Ms. Bach was given the diagnosis of vascular cognitive impairment due to cerebrovascular disease.

Chronic pain, depression, and anxiety are contributing factors that can lead to cognitive changes. The neurologist recommended discussion with PCP using alternative medications for Tramadol and clonazepam, treating her fibromyalgia and anxiety, respectively, as these medications can depress cognitive function. Ms. Bach was also prescribed Aricept 5mg to address cognitive deficits. Referral to outpatient physical therapy was initiated to address her history of falls and sedentary lifestyle.

Outpatient Neurologic Physical Therapy Examination

Subjective examination: Primary complaint: Ms. Bach presents with chief complaint of history of falls, difficulty doing daily activities due to her memory deficits, chronic back pain, and wanting to resume her community activities. Ms. Bach is present with her daughter, who assists with the history corroboration at the request of Ms. Bach. Further interviewing indicates she has less strength in her right leg than left, and weakness in bilateral arms as manifested by having difficulty lifting things (laundry basket).

Current level of function: ADLs and IADLs: Independent in ADLs with instability reported when washing hair and face with eyes closed, bed mobility – has very high bed and uses stool to climb in. Caregiver assistance needed for IADLs such as vacuuming, dishes, and transportation as she is no longer driving a car. Her daughter now manages finances and purchases food at grocery store for her mom due to cognitive difficulties with the task, back pain, and limited endurance. Assistance now provided for vacuuming and dishes is due to imbalance, low back pain, and onset of fatigue after about 10-15 minutes. Mobility: Ms. Bach, post CVA, ambulates with a single point cane (SPC) for long distances in community and uneven surfaces or parks. She does not use SPC in home and reports that she does not "furniture walk."

Falls history: Ms. Bach has had 3 falls over the past 4 months when tripping and unable to catch herself, imbalance when reaching high into her closet, and when stepping on concrete pavers in backyard to feed her birds. Her daughter reports that falls are usually sideways or backwards. She also reports instability when getting up during the night to use the restroom or when closing her eyes in the shower and needs to hold on to the walls. She denies history of orthostatic hypotension, dizziness, or vertigo symptoms.

Prior level of function: Independent in ADLs and IADLs; drove short distances around town to grocery store, bank, and for participation in social clubs and community exercise programs (Tai Chi); Exercise: stationary bike and/or aerobic walking 1-2x/week for 10 minutes, morning stretch routine; Gait: no assistive device required.

Medical history: Back pain started in her late 30s to early 40s when she was a full-time nurse and mother of 3 children; she was diagnosed with fibromyalgia thereafter. Ms. Bach's medical history is also remarkable for hypertension, depression, macular degeneration, osteoarthritis, endometriosis, valvular heart disease, cortical infarct of posterior cerebral artery, cerebrovascular small vessel disease, age related hearing loss for which she wears hearing aids, and hysterectomy. She had a cardiology consult follow up 1 week prior to PT evaluation with reported stable condition, no surgery recommended, and to continue current cardiac medications. Sensation is intact to light touch and protective sensation. Daily medication includes Aricept 10mg (was titrated up 5mg since neurologist evaluation), Mobic 15mg 1x/day (no longer taking tramadol), enalapril 20mg 1x/day, amlodipine 5mg

Meet the Authors: Be Part of the Discussion in the Journal Club

The APTA Geriatrics Journal Club is a free, facilitated webinar-based discussion about a Journal article where you interact directly with the author and a clinician with a relevant case study that demonstrates how that information could be used. It's a fun way to move yourself in the direction of life learning and beef up your evidence- based practice.

The next APTA Geriatrics Journal Club will be held **November 16, 2021** at 8 pm ET.

We will discuss **A Scoping Review of Physical Performance Outcome Measures Used in Exercise Interventions for Older Adults with Alzheimer Disease and Related Dementias**; *Journal of Geriatric Physical Therapy*: 2019;42(1):28-47.

Registration is required:
www.geriatricspt.org/events/webinars

1x/day, sertraline 50mg 1x/day (discontinued klonopin), Benefiber 1 gram chew 1x/day.

Social history and home environment: Ms. Bach is a retired nurse who lives alone in an active adult senior community single story home. Her daughter lives within 7 minutes of Ms. Bach's home and visits daily. There are grab bars in her walk-in shower, raised toilet seat with grab bars, night lights throughout her home, and no throw rugs or obvious obstacles in her home (per her daughter). There are small rocks and paver stones she walks on to get to her garden. Prior to the stroke, Ms. Bach enjoyed participating in her community's bocce club and Tai Chi program, a weekly breakfast with her ladies' group, and walking the community trail 1-2x/week with friends.

Patient goals: Ms. Bach would like to return to participating in her social and community programs, improve her balance, decrease her back pain, and increase her endurance.

Objective Examination at Initial PT Evaluation

Vital signs at rest in sitting: BP: 109/63mmHg, HR: 61bpm, SpO2: 97%

Cognitive screen: Brief Cognitive Rating Scale score of 22 correlates to 4.4 on Functional Assessment Staging of Alzheimer's Disease (FAST). Ms. Bach participates appropriately in conversation and questioning, demonstrates a mildly slowed mental processing, notes difficulty with retrieval of short-term memory, but responded well with the use of categorical, verbal, or visual cues. She demonstrates difficulty with dividing and alternating attention but can sustain attention appropriately during exam. Intermittently she requires 2 step commands during outcome measure testing with mirroring/modeling to facilitate successful understanding.

Pain: Central low back pain is described without report of radicular symptoms. Pain is exacerbated with standing duration of 10-15 minutes, vacuuming, lifting, and doing the dishes to 8/10. Prone position for 5 minutes, is reported to decrease symptoms to 4/10. She has generalized muscle soreness that is worst in the mornings. Modified Oswestry: 70%

Posture: Ms. Bach stands with forward head posture, rounded shoulders, mild thoracic kyphosis, mild trunk flexion, bilateral knees in genu valgum scapulae, Iliac crest heights, and leg lengths are symmetric.

Table 1. Outcome Measures

Cognitive and Functional Outcome Measures	Neurologist Evaluation	Initial Evaluation	1st Month PU	2nd Month PU	3rd Month PU & D/C	6-month Neurologist Follow Up	Psychometrics
MoCA	16/30					22/30	MDC for older adults = 4 scale points[1] MCID for adults after stroke = 2.15 scale points[2]
Timed Up and Go Test		16.7s	12.0s*[3,4,5]	9.5s*[3]	8.6s		MDC for AlzD = 2.8s[3], 3.44s[4], 3.96s[6], 4.09s[5]
Timed Up and Go Cognitive Test with serial 3s backwards		21.2s Seated: 5# Walking: 2#	20.5s Seated: 6# Walking: 3#	15.9s*[7] Seated: 6# Walking: 3#	11.0s*[7] Seated: 6# Walking: 3#		MDC for AlzD = 4.69 seconds[7]
10MWT - Preferred Gait Speed		0.82m/s	1.0m/s*[3, 5]	1.1m/s*[5]	.99m/s*[5]		MCD for AlzD = 0.13m/s[3], 9.44cm/s[5]
10MWT -Fast Gait Speed		1.09m/s	1.31m/s*[3]	1.68m/s*[3]	1.32m/s		MDC for AlzD = 0.21m/s[3]
Five Time Sit to Stand		18.35s with 1 arm assist required on 4th and 5th repetitions	21.5s	16.5s*[7]	13.6s*[7]		MDC for AlzD = 2.73s[7]
Six Minute Walk Test		900ft	1055ft	1348ft*[5]	1510ft*[5]		MDC for AlzD = 33.5m[5]
Berg Balance Scale		38/56	41/56	48/56	53/56		MDC for AlzD = 16.66points[7]
MiniBESTest		16/28	20/28	22/28	24/28		[8]

**= achieved Minimal Detectable Change (MDC), MCID = Minimal Clinically Important Difference, PU = Progress Update, D/C = Discontinuation of Services*

Flexibility: Moderate tightness in hip flexors, quadriceps, hamstrings, and plantar flexors bilaterally.

Strength (left hand dominant): Bilateral (B) hip extensors: 2/5, B hip abductors: 3/5, B hip flexors: 4/5, B knee extensors: 4+/5, B knee flexors 4/5, B plantar flexors 2/5, B dorsiflexors 4/5. L shoulder flexion and abduction, elbow flexion and extension: 4/5, R Shoulder flexion and abduction, elbow flexion and extension 3/5.

Gait: Ms. Bach ambulates with SPC into PT clinic using a 3-point gait pattern with cane in left hand. Gait Analysis: When ambulating without SPC, there is downward gaze when ambulating in closed environment on even smooth terrain, instability with turning requiring intermittent stepping strategy for self-recovery, flat foot contact with no heel-toe rocker or terminal knee extension and push off, decreased step length below community recommendations at 1.2ft bilaterally, mild lateral sway, minimal trunk rotation, asymmetric arm swing amplitude- right smaller than left. Ms. Bach required intermittent seated rest breaks due to fatigue and impaired activity tolerance.

Assessment

Ms. Bach presents to skilled PT initial evaluation with diagnosis of vascular cognitive impairment due to cerebrovascular disease with multiple occurrences of falls, impaired power with right worse than left bilateral lower extremity weakness (FTSTS); impaired anticipatory (BBS) and reactive postural control (MiniBESTest); difficulty with dynamic balance (MiniBESTest); increased dual task cost(TUGC); decreased gait speed (10MWT) with noted gait deviations in step length and arm swing symmetry; increased care partner support for IADLs required; chronic low back pain (Modified Oswestry) with history of fibromyalgia and thoracic kyphosis; visual impairments; and sedentary lifestyle with decline in exercise, community, and social participation. Along with her recent history of injurious falls, outcome measures indicate she performs below age matched norms and is at risk for falls. Cognitively, she scores a 4.4 on the FAST-indicating mild dementia, presenting with decline in mental processing speed, visuospatial and executive function deficits, yet demonstrating improvements in recall with categorical and visual cues during evaluation. With a significant history of cardiovascular and cerebrovascular disease and current sedentary lifestyle not achieving World Health Organization physical activity guidelines, she would benefit from prescription of individualized home exercise program to optimize brain and heart health and decrease her risk of falling. Caregiver training will be emphasized throughout Ms. Bach's skilled plan of care.

Plan

Frequency: 2x/week

Discussion

Vascular dementia accounts for 16 percent of cases of dementia in people over 60 years old.[21] Compared to healthy individuals without cognitive impairment, individuals with cognitive impairment experience 2-3 times more falls.[22, 23] Skilled physical therapy can help improve gait, balance, and cognition in people with vascular cognitive impairment, including Alzheimer's disease and other related dementia.[24] Accurate examination and effective patient education are challenged by the presence of dementia.25 Implementation of standardized outcomes that are frequently used and responsive to exercise interventions will decrease the considerable variability in the evaluation of individuals with Alzheimer's disease and related dementias. With the utilization of outcome measures with good to excellent reliability from this scoping review by McGough and colleagues,[26] the Six Minute Walk Test, Timed Up and Go Test (TUG), Five Time Sit to Stand Test, Berg Balance Scale (BBS), and 10 Meter Walk Tests were selected for the assessment of Ms. Bach's aerobic capacity, functional and community mobility, lower extremity strength, balance, and gait speed, respectively. To prevent a potential ceiling effect with utilization of the BBS when assessing her progress over time, and to further assess Ms. Bach's anticipatory postural adjustments, reactive postural control, sensory orientation, dynamic gait, and motor-cognitive dual task interference, the MiniBESTest was performed. MDCs, from the literature and as indicated in Table 1, for individuals with mild – moderate Alzheimer's disease were used to develop Ms. Bach's goals; these most closely approximated the demographics and disease status. Ms. Bach improved her performance in all outcome measure domains with MDC achievement in nearly all categories, including a decreased risk for falls based on TUG, BBS, and MiniBESTest. At Ms. Bach's 6-month neurologist follow up, her MoCA score improved 6 points, achieving the MDC for older adults of 4 points1 and the MCID of 2.15 points among adults after stroke.[2] Improvement in cognitive changes may stem from the following: prescription of Aricept, a cholinesterase inhibitor used to promote mental function;[23] the deprescription of and the removal of anticholinergic medication;[4] the physiological effect of increased blood flow to the areas of the brain associated with memory, mental speed, and attention[25,26] through the skilled physical therapy exercise interventions and home exercise program; increased socialization and participation in community programs; and her care-partner supported activities facilitating independence for safe daily functional and mobility performance.

Given progressive impairment and functional decline over time, utilization of reliable and responsive outcome measures as indicated in the scoping review by McGough and colleagues[26] plays a pivotal role in the development and implementation of individualized care management

Table 2. Treatment Interventions

Activity/Education Domain	Treatment Interventions
Aerobic Capacity	• Treadmill training (gait speed changes, interval training, with and without arm support), recumbent stepper. Goal: Target heart rate zone: 65-80% of maximum heart rate zone[9,10,11,12] or rate of perceived exertion of 13-15/20 • Dual task training with utilization of motor or cognitive secondary task
Muscular Strength and Power	• Functional based movements: sit <>stand, floor<>stand transfers, stair negotiation • Core stabilization; components of OTAGO program with resistance; strengthening focused on power, eccentric control, extensor, and ankle musculature
Balance	• Static balance progression: reaching outside of limits of stability, compliant surfaces with application to functional tasks. • Anticipatory postural control; Reactive balance postural control training: stepping strategy over ground, slip board training • Dynamic balance obstacle negotiation and multidirectional gait training over ground and on treadmill
Flexibility	• Hip flexors, quads, hamstrings, gastroc/soleus group
Lumbar Stabilization & Postural Training	• Transversus abdominis contraction, lumbar stabilization series and progression; body mechanics training for lifting laundry basket; thoracic extension and pectoralis musculature stretching and scapular strengthening
Dual Task Training[13]	• Cognitive Domains[14,15,16,17]: semantic and phonemic fluency, attention/selective attention, problem solving and planning, mental manipulation, sequencing, short term recall • Apps: *Heads Up!* • Completed during treadmill and recumbent stepper, obstacle negotiation, static balance and reactive balance training
Home Exercise Program	• Individualized program based on activities above with simplified instructions with pictorial depictions, designed for Ms. Bach to complete as independent as possible with care-partner supervision or intermittent assistance. • Supervised aerobic walking and stationary biking program with cognitive dual task training, when possible, facilitated by daughter or personal care assistant, with goal for 30 minutes of moderate intensity, 5 days per week.
Educational Interventions/ Care-Partner Training	• Education to Ms. Bach and care-partners on the functional and cognitive benefits of exercise, exercise parameter recommendations slowing neurodegenerative disease and promotion of cardiovascular health, Ms. Bach's risk for falls based on her history of falls and outcome measure testing, home modification recommendations, following medical and nutritional guidelines for controlling blood pressure and blood glucose, continue annual vision exams, and mental health care to diminish anxiety and depression as it relates to chronic pain. • Education to Ms. Bach and daughter about benefits of having a personal care assistant for support with IADLs, transportation for medical appointments, community, and social activities. • Progression of education to daughter and personal care assistant on safe facilitation of modified independence, implicit learning strategies[18], strength based approach[19,20], engagement of community programs.

plans, such as Ms. Bach's. Every attempt needs to be made by the clinician to perform outcome measures for individuals with cognitive impairment along the disease spectrum. It is important for clinicians to understand that as the disease process progresses in an individual with cognitive impairment, the complex language and multi-step process of the instructions for standardized testing may require the clinician to utilize and ensure documentation of both the level and the form of various cuing required during testing to allow replication of testing conditions.[4] However, with an integrated and interdisciplinary approach, insight and observation skills, adaptation of the communication process, and utilization of interventions of best practice, clinicians can effectively serve this rapidly growing population of individuals with cognitive impairment.

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10 Signs You're Burning Out and What to Do About It

by Morgan Nolte, PT, DPT

A recent report on the prevalence of burnout among healthcare workers shows that, "certain allied health professionals reported the highest rates — in the 60 percent range. Self-reported mental health symptoms of increased anxiety and depression were also prevalent among these health workers — in the 50 percent range."[1]

Going into the 20th month of COVID-19, I'm reminded we have been in a global pandemic for the amount of time that exceeds my 2, full-term pregnancies. The stress and demand for Gumby-like flexibility, along with pay and job insecurity of many healthcare workers, is something no one could have imagined. Healthcare workers are being stretched physically, mentally, and emotionally.

Companies' budgets are being stretched, too. Employees are being asked to do more with less. Employers are trying to keep everyone safe and employed. Amidst the turmoil of constant change, budget cuts, budget reallocations, and increased demands on healthcare workers, it's understandable that employee burnout is on the rise.

With so many critical priorities to juggle — namely client and employee safety, and keeping the doors open — employee wellness may have slipped through the cracks. Workplace burnout naturally leads to turnover; this can cause a domino effect in the workplace and increase stress for the employees who stay.

What is Workplace Burnout?

Workplace burnout has been defined as a prolonged response to chronic emotional and interpersonal stressors on the job.[2]

The 3 dimensions of burnout include:

- **Emotional exhaustion:** the feelings of being depleted of one's emotional and physical resources.[3]
- **Cynicism (or depersonalization)**: the development of dehumanized and cynical attitudes toward people who are recipients of one's services.[4]
- **Reduced accomplishment:** a decline in one's feeling of competence and successful achievement in work leading to inefficiency.[3,4]

Like rust, burnout is viewed as a process in time. Increased coping efforts with external demands leads to emotional exhaustion. This chronic exhaustion triggers cynicism, which leads to diminished personal accomplishment. A lower sense of personal accomplishment contributes to further emotional exhaustion, and the burnout cycle continues.[3]

What are the Consequences of Workplace Burnout?

Employees with elevated burnout, specifically emotional exhaustion, experience more adverse events, accidents, injuries, and have lower levels of customer satisfaction.[5] Not only does job performance suffer, but absenteeism and turnover increase[3]

Burnout is a lose-lose situation for employees and employers.

Predictors of Job-Related Well-Being and Burnout

With health care burnout increasing, it's critical that employers and employees take a critical look at what can be done to mitigate burnout. Some factors fall at the organizational level, some at a departmental level, and others at a personal level.

The following have been shown to be predictors of burnout in the workplace.[3,5,6,7]

- Excessive and prolonged stress
- Low job control (autonomy)
- Low reward
- Job insecurity
- Reduced resources (time, money, personnel)
- Higher job demands
- Higher time-pressure/productivity
- Hindrance stressors (hassles, interruptions, situational constraints, organizational politics)
- Unclear job expectations
- Low work-life balance
- Lack of social support

Work-related critical incidents such as unexpected and severe events like the death of a patient increase anxiety and depression among healthcare workers. Many of these factors were negatively impacted as a direct result of COVID-19. To compound the issue, there is not a clear end in sight.

In the light of COVID-19, employee wellness may have had to take a backseat to employee and patient safety, and the economic concerns of staying in business. However, 20 months in, I think it's time to take burnout seriously to maintain a strong healthcare workforce coming out of this pandemic. Healthcare workers cannot continue to serve patients at the expense of their own physical and mental wellbeing.

Do You Have Workplace Burnout?

Signs of workplace burnout can mimic depression and vice versa. If you feel like you have any of these signs, consider meeting with your doctor to discuss this further.

- Increased cynicism about your work
- Lower motivation to go to work
- Irritability or impatience with co-workers or clients
- Preoccupied with work, even when you're not at work
- Fatigue and a lack of energy to be productive consistently
- Difficulty concentrating
- Hard to find satisfaction from your achievements
- Using food, drugs, or alcohol to numb or cope with your feelings
- Difficulty sleeping or change in sleeping patterns
- Unexplained weight gain or weight loss, headaches, stomach or bowel problems, or other health ailments

Left unchecked, burnout can do serious damage to your health. The chronic stress can lead to a lack of energy, time, and motivation to focus on your own health. As a result, you may be increasing your risk for mental health conditions like anxiety or depression, and physical health problems like high blood pressure, diabetes, and obesity. Needless-to-say, relationships can suffer, too.

The bottom line is that if you do not take proactive measures to care for yourself, you will not be able to care for others as well as you'd like. Yes, we have been in a global pandemic and have had to be flexible and pivot. However, we cannot continue at this pace without expecting the personal and organizational consequences of workplace burnout.

What Can Be Done for Workplace Burnout?

As healthcare workers we are givers, achievers, and helpers. In this 20th month of COVID, it may be time to think about how we can better support our mental and physical health as we eagerly anticipate the "end" of this global pandemic.

When we are in survival mode, there is no margin. No extra money. No extra time. No extra energy. We are spent. In recovering from this pandemic, I feel there will be a sense of emotional whiplash and a need for decompression. Followed by a time of intentional investment into, and replenishing of, our wellbeing.

While there is much that can be done by an employer to support employee wellness, I believe that in the end, it requires personal responsibility. We can teach the exercises to our clients, but they must do them. Our employers can give us wellness resources, but it's up to us to use them.

What You Can Do?

I've experienced burnout on and off several times in my life related to school, work, and family life during COVID. For a while I thought there was something "wrong" with me. Like I was too sensitive, or not hard-working enough, or simply couldn't handle the rigor of health care. Then I realized that burnout is more widespread; I wasn't the only one masking my feelings.

These suggestions are simply a list of what has worked for me. While I didn't implement them all at once, it has been a consistent focus over the last 4 years to prioritize my own mental and physical health so that I can enjoy good health and better relationships.

You may need to start by creating time and space in your calendar for you to do the mental and physical work it takes to get over burnout. Create intentional margin in your schedule for your health. Even 10 minutes a day consistently can build momentum. Without intentional margin, you will not have the mental and physical energy required to execute the following strategies:

1. Set stronger work boundaries.
2. Be intentional about having fun with loved ones.

3. Focus on progress, not perfection. I had to adjust my workflow to include more point-of-care documentation and lower my documentation standards so that work didn't encumber my evenings and weekends.
4. Re-evaluate your commitments and priorities. Say "no" to requests that are not a top priority for you.
5. Reduce time scrolling through social media. Make online interactions intentional versus passive.
6. Prioritize your physical health and consider exercise a form of stress management.
7. Seek counseling (and medications if needed) for anxiety and/or depression.
8. Focus on strategies to get better sleep. Consider reducing screen time or using blue light blocking glasses 60 minutes before bed to increase melatonin. Try to avoid eating 3 hours before bed to allow your body temperature to come down. Unless you are immune to its effects, limit your caffeine intake after noon.
9. Improve your nutrition to reduce metabolic stress. This includes staying hydrated, reducing added sugar, refined carbohydrates, refined seed/vegetables oils, and excessive alcohol. Increase consumption of foods high in DHA and EPA omega-3 fatty acids such as salmon and spirulina.
10. Try stress-management techniques such as regular prayer, journaling, or meditation.
11. Ask for help! Recognize your own limits and limitations. Seek support from family, childcare providers, or your employers so you can create more margin for your personal wellness.

While getting over burnout is a process, in the long run, your health is worth it. I believe one of the best things we can do for our clients is to lead by example by prioritizing our mental and physical health. After all, when we better take care of ourselves, we can better take care of others.

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Walk the Talk: Putting Examination of Gait into Practice

by Carole Lewis, PT, DPT, PhD, FAPTA and Linda McAllister, PT, DPT

In our last series of articles, we have been discussing examination tools and interventions for older adults along the mobility spectrum. In this article, we will review measures for gait, one of the most important aspects of older adult movement and frequent target of interventions.

What comes to mind first and foremost in a discussion of gait assessment is a measure that has been extensively studied, is relatively quick and easy to perform, and has been described as a "functional vital sign:" Gait speed.[1] Gait speed gives us a wealth of information in exchange for the comparatively short time it takes to test. Gait speed is related to risk of falling and can be used to classify ability to access the community. It predicts the trajectory an individual may be on regarding overall function and health: it is predictive of functional decline, frailty, mobility-disability, cognitive decline, likelihood of institutionalization, even hospitalization and mortality.[1] Therapists should consider measuring gait speed routinely for all older adults who can walk without physical assistance to get this salient information.

There are notable white paper and review articles which reference the extensive research on gait speed.[2] Middleton et al[1] is a good example as are large-scale studies with age-matched normative data.[3] Fall risk and risk of other decline starts increasing with self-selected gait speed values lower than 1.0 m/sec;[4] risk of recurrent falls increases with speeds less than 0.56/msec.[5] Average normal gait speed ranges from 1.34 m/ sec for 60-69 year old males to 0.94m/sec for 80-99 year-old females.[3] We encourage you to dig deeper into these excellent references.

Gait speed measurement has been described in the literature with varied methods; measurement distances as short as 8 feet and as long as 10 meters have been described. A recent systematic review of gait speed measurement in older adults[6] recommended this standardized protocol:

- Mark a 9-meter distance.
- Include a starting 2.5 meters distance for acceleration, measure over the next 4 meters, and have the participant come to a stop over the last 2.5 meters.
- Measure normal walking pace (usual walking aids permitted) in a straight line.
- Measurement is taken with a stopwatch over the 4-meter distance.
- The fastest of 2 trials is recorded.

Physical therapists know the importance of examining gait during dynamic balance tasks. One familiar measure is the Dynamic Gait Index (DGI), a valid and reliable measure of the ability to maintain balance during walking with various task demands. Cut-off scores for fall risk range from 19 (of maximum of 24) points for community-dwelling old adults7 to 22 for participants with diabetic peripheral neuropathy.[8] Perhaps less familiar to clinicians are modified versions of the DGI that have been studied which expand the scoring and one which makes the test more concise.

A modified and expanded version of the DGI (mDGI) adds points in the assessment for timing and level of assist required for each task. This expansion captures more facets of performance, avoids a ceiling effect, and provides a larger range of measurement. The mDGI includes 8 points for each item for a total of 64 possible points.[7]

The Functional Gait Assessment (FGA), another modification of the DGI, adds 3 items to the original test to address ceiling effects and better capture vestibular impairment. These items are walking with eyes closed, walking with a narrow base of support, and walking backwards. FGA items are scored on a 4-point scale for a total of 30 points. Scores of 22/30 or less indicate increased risk of falling for community dwelling older adults.[9] A recent study demonstrated that hands-on contact guarding by an experienced physical therapist did not significantly alter test scores for community dwelling older adults as compared to stand-by assist.[10] It appears contact-guarding may be used for safety during the administration of these higher-level gait tasks.

When there is a time constraint, a shorter version of the DGI has been studied. The 4-item DGI has demonstrated similar clinical psychometric properties to the original 8-item test.[11] The test keeps 4 of the original items in the DGI and has a cut-off score of 10/12.[11]

The assessment of turns in both directions and curved walking, distinctly different from straight-path locomotion is addressed in The Figure 8 walk test (F8WT). Cones are placed 5 feet apart for this test. The participant starts in the center and walks on a figure 8 path around the cones. The walk is timed, the number of steps is counted, and smoothness of the steps are graded.[12] Emerging research demonstrates that this is a valid measure in people with Parkinson's disease (among other clinical groups) and may detect gait impairment not detected with straight path testing.[13] Another recent study determined that clinicians may use cut-points from the F8WT as preliminary guidance for clinical decision making when working with community dwelling older adults.[14] Performance times of ≤ 9.09 seconds and ≤ 9.29 seconds discriminated, respectively, between individuals with self-reported excellent and excellent/very good overall mobility. In addition,

a total number of steps of ≤17 discriminated participants with excellent/very good global balance. Performing well in relation to these cut-points was associated with an approximately 30-60 percent lower risk of negative consequences such as falls and utilization of health care.[14]

The last measure in this review is the 3-meter backwards walk (3MBW) test, a novel assessment introduced by Carter et al in 2019.[15] In a sample of community – dwelling older adults, the 3MBW test was more predictive of retrospective falls than other commonly used tests like the Five Times Sit-to-Stand test and the Timed Up and Go. The study identified a low risk of falls with a score of 3 seconds and a high risk of falls at 4.5 seconds.[15] A different retrospective study in 2020 examined the association of the 3MBW score with fall history in people with Parkinson's disease. An increased risk of retrospective falls was associated with a cut-off score for the 3MBW of 4.2 seconds in this population.[16]

Next time you are doing an examination with an older adult, consider administering one or more of these valuable measures to get an objective measurement of gait; use some of the well-researched information for the interpretation of the score! In our next article, we will discuss intervention strategies for gait.

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