GeriNotes

January 2022 • Vol. 29 No. 1

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

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In This Issue

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From the President

Cathy Ciolek
President,
APTA Geriatrics

A new year is always filled with exciting possibilities and a time of reflection on accomplishments. I hope you will indulge me as I review all APTA Geriatrics managed to accomplish in 2021 (APTA's Centennial Year) despite the pandemic creating some challenges. [See the graphic on the next page for key metrics from 2021.]

There are many great accomplishments; the entire volunteer leadership and staff should be commended. This includes the incredible growth of our online educational courses and the growth of Journal Club (JClub). Each JClub represents collaboration between our 6 Special Interest Groups (SIGs), the editors of both the Journal of Geriatric Physical Therapy and GeriNotes, our JClub Coordinator, and field clinicians/SIG members willing to share their expertise. They work together to connect a research article published in JGPT and a case application article in GeriNotes to help translate science into practice. This has become an important member benefit. These free, 1.5-hour webinars have exceeded our growth expectations such that we have had to enlarge our capacity. [Register for the next JClub, Tuesday, Jan. 18, at www.geriatricspt.org/events/webinars]

To recognize APTA's Centennial Year, the Board of Directors approved a $100,000 donation, via the Foundation for Physical Therapy, to create APTA Geriatrics-sponsored PODS I and II level scholarships. These funds will be used to support the development of a cadre of geriatrics-based physical therapy researchers, continuing our history of seed funding through grants.

This year also included:

- adopting new bylaws
- our first section votes in the APTA House of Delegates
- JGPT attaining an impact factor that puts it in the top 10 journals for rehabilitation
- offering GCS prep course/mentor options
- launching new task forces
- forming a Diversity, Equity, Inclusion (DEI) committee
- and forming new partnerships with the Centers for Disease Control (CDC)

APTA Geriatrics strives to serve as an advocate for our profession and patients and to be a trusted resource for professional education and training. In 2022 we look forward to the publication of new Clinical Practice Guidelines, continuing the outstanding development of the Journal of Geriatric Physical Therapy to share research for best practice physical therapy for ageing adults, and being together for the APTA Combined Sections Meeting, either in person or via the educational programming or section events that will be online.

Also for 2022, the Board of Directors voted to make student dues free this year! This is part of our effort to create opportunities for greater student engagement and to develop the geriatric workforce of the future. We will be launching a new task force on student engagement. If you have a student in an internship or teach in an academic program, help us increase our participation by inviting students to join APTA Geriatrics.

As we sign off on 2021 and welcome 2022, it is important to recognize you, our members, who have persevered to provide the best patient care possible despite the challenges of the continuing pandemic. Sometimes in exhaustion, in what, at times, felt hopeless, you found ways to help ageing adults live the best lives possible in the circumstances. Thank you for all you do every day to make the world a better place. Thank you for your continued support of APTA Geriatrics.

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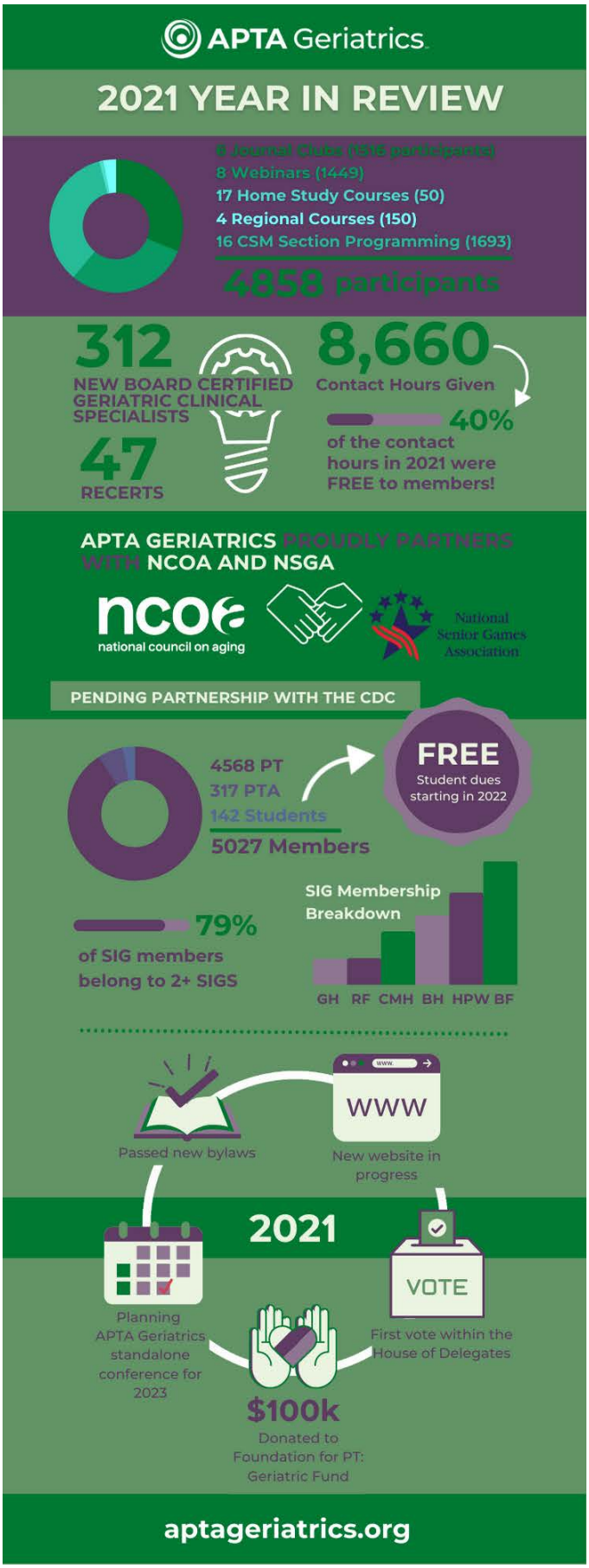

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terms begin February 2022

From the Editor

Michele Stanley
Editor,
GeriNotes

I think that I can confidently speak for everyone that has been at all actively engaged in any APTA Geriatrics leadership position: We appreciate being part of this group of amazing and dedicated professionals who push themselves, their colleagues, and their clients to move, engage, and live well. We appreciate your membership, your readership, and your commitment to optimize the experience of ageing!

We appreciate those of you who take the time to engage in our webinars and the Journal Club! Participation has steadily grown to, at times, over 300 attendees, each receiving 1.5 CEUs. And remember, it's FREE for members! What a treat to hear a researcher explain their study and then a skilled clinician explain how they put the new research information into actual patient care. So good. So useful. So fun. Please consider loaning your clinical skills and volunteering to case present the next time.

AND JUST LIKE THAT => Look what happens when we are intentional in our learning. Several students and their mentors collaborated to produce a clinimetric breakdown of the Two Minute Step Test [page 24] that follows the Bohannon and Crouch (2019) paper[1] discussed in the May 2021 JClub.[2]

Obviously, it is easy to appreciate those that send kudos your way. As Editor, your response to the changes and growth of GeriNotes is very motivating and gratifying to me. It has been fun to get your responses, especially to last month's Focus Issue [Ageing in the Time of COVID, Volume 8(5) November 2021]. Remember that taking the accompanying exam is an easy way to get 0.4 CEUs. I especially appreciate the combined efforts of the 20+ authors and editorial team members who promote the profession by volunteering their hours of expertise.

We also appreciate the feedback from the not-so-pleased. The lively discussions that pop up on our Facebook page are appreciated and noted. We learn from them and from one another. In the last "From the Editor," a member very appropriately and rightly took me kindly to task for including the axiom "Ageing isn't for Sissies." Of course, as that person pointed out, I did not use it to be intentionally derogatory of the process of getting older or, by extension, implying that ageing is equated to being weak or cowardly in a stereotypically feminine or homophobic way. I wasn't thinking of the words or their implications at all. My favorite grandparents, I remember from early childhood, used to say to each other all the time: "getting old ain't for sissies" and then they would both giggle. The 5-year-old me thought it was a funny and wonderful thing to say although the adult me now wonders what personal message they were sending that was so funny between 2 loving, but not generally light-hearted people! The personal reflection aside, I appreciate the opportunity to learn and increase my sensitivity. APTA Geriatrics is committed to diversity, equity, and inclusion and I deeply regret that my less-than-thoughtful words may have offended someone. Much of racism and other expressions of bias are so hidden and embedded in our language and customs that we don't "see it." This learning, — really, unlearning — is hard; much like how patients have to unlearn unhealthy habits, and learn new skills, with repetition and increased resistance. I commit to learning, to being a better person: I hope that you will too.

1. Bohannon, RW, Crouch RH. Two-Minute Step Test of Exercise Capacity: Systematic Review of Procedures, Performance, and Clinimetric Properties. J Geriatr Phys Ther, 2019;42(2):105-112.
2. May 2021 Journal Club recording: https://geriatricspt.org/events/webinars/?recID=4925A0B0-D423-C870-CE7ADC32E8DEA593

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.

APTA Combined Sections Meeting

Feb. 2-5, 2022 / San Antonio, Texas

APTA members save big on registration for the largest physical therapy conference in the country.

- Enjoy first-class programming from all 18 sections and academies.
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- Network with thousands of other attendees.

Can't make it to San Antonio? An on-demand option will be available March 1-31.

Learn more and register today at apta.org/CSM.

All in-person attendees will be required to show proof of COVID-19 vaccination or a negative test within 72 hours to receive a participant badge. Masks will be required indoors. In-person attendees also get complimentary access to on-demand content between March 1 and 31, although without the ability to attain additional CEUs.

APTA
American Physical Therapy Association

APTA Combined Sections Meeting

Feb. 2-5, 2022

APTA American Physical Therapy Association

APTA Geriatrics
An Academy of the American Physical Therapy Association

Geriatrics Section Programming

Wednesday, February 2, 2022

8:00 AM - 5:00 PM

GR-10993 Integrating Lifestyle Medicine Into Physical Therapy for the Ageing Adult *1-day Preconference Course
Nola S. Peacock, PT, MPT, DSc and Michael Leonard Puthoff, PT, MPT, PhD

Thursday, February 3, 2022

6:30 AM - 7:45 AM

GR-11596 APTA Geriatrics GCS Breakfast and Recognition Ceremony

8:00 AM - 10:00 AM

GR-10965 Body Composition, Disordered Eating, and Their Management in Older Adults: What PTs Should Know
Odessa Rene Addison, PT, DPT, PhD, Monica Serra and Lisa Kilpela

GR-11064 Conquering COVID-19: Offering Virtual Fall Risk Screening and Fall Prevention Programs for Older Adults
Jennifer M. Nash, PT, DPT, Mindy Oxman Renfro, PT, DPT, PhD and Shannon Martin, OTD, OTR/L, BCG

GR-11473 Geriatrics Platform Session 1
Jessie M. Van Swearingen, PT, PhD, FAPTA

GR-11598 Carole B. Lewis Lecture — Management of the "Difficult" Patient
William H. Staples, PT, DPT, DHSc, FAPTA
Henry B. Gonzalez Convention Center - 007

11:00 AM - 1:00 PM

GR-10567 Chronic Pain, Opiates, and Physical Therapy: Considerations for the Older Adult
Kenneth L. Miller, PT, DPT, Sarah Brook Wenger, PT, DPT and Yein Lee

GR-10707 Comorbidities and the Brain: It All Trickles Uphill
Kimberly Ann Lemmons, PT, DPT, Bethany Joann Spain, PT, DPT and Kristi Ferguson

3:00 PM - 5:00 PM

GR-10507 A Collaborative Teaching Design To Improve Integration of High-Intensity Interventions in Ageing Adult Curriculums
JJ Mowder-Tinney, PT, PhD, Ann Pharr and Season Manchester Bonino, PT, DPT

GR-10896 Integrating the Annual Physical Therapy Visit for the Ageing Population Into Clinical Practice
Michael Leonard Puthoff, PT, MPT, PhD, Tara Connors, Hadiya Green Guerrero, PT, DPT and Gina Lynne Pariser, PT, PhD

GR-10942 APTA Geriatrics Evidence-Based Guidelines for Osteoporosis
Keith Gerard Avin, PT, PhD, Kathryn Elizabeth Roach, PT, PhD, Sherri R. Betz, PT, DPT, Carleen Lindsey, PT, MScAH, Robert Nithman and Gregory W. Hartley, PT, DPT, FAPTA

6:30 PM - 8:30 PM

GR-11599 APTA Geriatrics Awards Ceremony & Members Meeting sponsored by Aegis Therapies

Friday, February 4, 2022

8:00 AM - 10:00 AM

GR-10462 Pandemics and Policy: Providing Patient-Centered and Evidence-Based Care in Skilled Nursing Facilities
Rachel Ann Prusynski, PT, DPT, Nicole Nexon, PT, MSPT and Kim Schminkey, PT,CLT-LANA,CKTP

Programming as of 12/13/2021. Please visit www.apta.org/csm for updates.

Register at
www.apta.org/csm

GR-10815 Uploading and Upgrading Geriatric Physical Therapy: Understanding and Integrating Telehealth With Vulnerable Older Adults
William Braun Dieter, PT, DPT and Katherine Rose Sheehan, PT, DPT

GR-11475 Geriatrics Platform Session 2
Jessie M. Van Swearingen, PT, PhD, FAPTA

11:00 AM - 1:00 PM

GR-10410 Physical Activity in Ageing: Leveraging Behavioral Economics to a Healthier Society As We Age
Mike T. Studer, PT, MHS, FAPTA and Tiffany Elisa Shubert, PT

GR-10626 U.N. Decade of Healthy Ageing: How You Can Help Make Healthy Ageing a Reality
Cathy H. Ciolek, PT, DPT, FAPTA, Dale Lynn Avers, PT, DPT, PhD, FAPTA, Jennifer M. Bottomley, PT, MS, PhD, William H. Staples, PT, DPT, DHSc, FAPTA, David W. M. Taylor, PT, DPT, Lisa Dehner, PT, PhD and Rickard Dustin Jones, PT, DPT

GR-10757 The Forgotten -Ism: How Ageism Impacts Delivery of Physical Therapy Care of the Older Adult
Heidi Moyer, PT, DPT, Haim D. Nesser, PT, DPT, Andrew C. Thomas, PT, DPT and Mariana Wingood, PT, DPT, MPH

3:00 PM - 5:00 PM

GR-10642 Bone Health: Applications for Prevention and Intervention Across Practice Specialties
Nancy Claire Cullinane, PT, MHS, Kathryn K. Brewer, PT, DPT, MEd, Cynthia Jean Watson, PT, DPT, Stephanie Marie Prinster, PT, DPT and Carleen Lindsey, PT, MScAH

GR-10725 Challenge Accepted! Who, Why, and How To Apply High-Intensity Exercise to Postacute Rehabilitation
Jennifer Elaine Stevens-Lapsley, PT, MPT, PhD, FAPTA, Allison Marie Gustavson, PT, DPT, PhD, Daniel Joseph Malone, PT, MPT, PhD, Tyler Bjorhus, PT, DPT and Sara L. Ochoa, PT

GR-11027 The Role of Physical Therapy in the Management of Depression: Can We Do More?
Catherine Jefferson VanDerwerker, PT, DPT, PhD, Alicemae Bell, PT, DPT, Gregory Sahlem, MD and Lisa Kristine Saladin, PT, PhD, FAPTA

Saturday, February 5, 2022

8:00 AM - 10:00 AM

GR-10637 Osteoporosis Screening Tools: GeriEDGE Scoping Review Results
Kent Edward Irwin, PT, DHS, MS, Emma Louise Phillips, PT, DPT, Puneet Dhaliwal, PT, Christina Freshman, PT, DPT and Michelle G. Criss, PT, DPT

GR-11476 Geriatrics Platform Session 3
Jessie M. Van Swearingen, PT, PhD, FAPTA

11:00 AM - 1:00 PM

GR-10568 Incorporating APTA Geriatric Guiding Principles To Bridge the Value Gap in Clinical Practice
Kenneth L. Miller, PT, DPT, William H. Staples, PT, DPT, DHSc, FAPTA, Michelle G. Criss, PT, DPT and Veronica Norton Southard, PT

GR-10586 Holistic Documentation: Telling the Patient's Story With Clinically Persuasive and Person-Centered Details
Jaclyn Kay Warshauer, PT and Mary L. Saylor-Mumau, PT, MPT

3:00 PM - 5:00 PM

GR-11356 Virtual? Live? Hybrid? The Role of Physical Therapy in Personalized Health Promotion
Lori A. Schrodt, PT, PhD, Tiffany Elisa Shubert, PT, Beth L. Rohrer, PT, DPT, Jennifer Lynn Vincenzo, PT, MPH, PhD and Colleen Griffin Hergott, PT, DPT

The 2022 Regulatory Round-Up

by Ellen R. Strunk, PT, MS

This time of year brings us many things: football, family, friends, fun, and a time to rest and recharge. But it also brings us a lot of information to digest and assimilate into our practices. So let's take a look at what we know about 2022.

The first rules published were the FY 2022 Inpatient Rehabilitation Facility (IRF) Prospective Payment System (PPS) Final Rule (86 FR 42362)[1] and the Skilled Nursing Facility (SNF) PPS Final Rule (86 FR 42424)[2] on August 4, 2021. These were followed by the Inpatient Prospective Payment System (IPPS)/Long-Term Care Hospital (LTCH) PPS Final Rule (86 FR 44774)[3] on August 13, 2021.

Some themes emerged in this first set of post-acute care rules (see Table 1 on page 11). Most providers were concerned about their payments in the new year and were relieved when CMS declined to make significant changes to the rates paid to post-acute care (PAC) providers. COVID-19 and infection control was also a hot topic with the addition of the COVID-19 Vaccination Coverage among Healthcare Personnel (HCP) measure added to each of the Quality Reporting Programs (QRPs). Additionally, skilled nursing facilities will see the SNF Healthcare Acquired Infections (HAI) Requiring Hospitalization measure added to the SNF QRP. All 3 rules also included 2 Requests for Information (RFI): one on how CMS can close the health equity gap that became so visible during the COVID-19 public health emergency (PHE) and one on advancing Fast Healthcare Interoperability Resources (FHIR) in support of digital quality measurement in the PAC QRPs. While CMS did not respond to specific comments they received in response to the RFIs, they did commit to continue to engage with stakeholders. Both subjects covered by the RFI are subject matter that APTA Geriatrics is also committed to addressing. In late 2021, the Academy of Geriatric Physical Therapy Task Force on Best Practice released Guiding Principles for Best Practice in Geriatric PT[4] which includes the statement that a part of best practice is for PTs and PTAs to advocate to reduce health disparities and health care inequities and improve access to health care services. The Post-Acute Care Interoperability Organization (PACIO)[5] has several APTA-Geriatrics members who engage weekly in these discussions with other stakeholders, vendors, and CMS. PACIO is an organized project chartered by CMS and is driven by its members. Becoming involved is easy (and free!) and participation is welcome. For more information, email info@pacioproject.org.

The last PAC setting to have its rule published was Home Health (HH). The HH PPS Final Rule (86 FR 64996)[6] was published on November 9, 2021. As with the other PAC settings, CMS declined to reduce payment rates in the ongoing PHE. In what may have been a welcome surprise, CMS delayed the implementation of the nationwide Value-Based Purchasing (VBP) Program until January 1, 2023 which gives providers more time to prepare for what might be a titanic shift in culture. The HH PPS Final Rule also included a "surprise" change for the IRF and LTCH settings. CMS included a rider in the HH rule that revised the compliance date for the updated assessment tools. These and other changes are outlined in Table 2 on page 12.

The last rule to be published of interest to physical therapy was the Medicare Program: CY 2022 Payment Policies Under the Physician Fee Schedule and Other Changes to Part B Payment Policies Final Rule (86 FR 64996).[7] This rule impacts the majority of PTs and PTAs in practice because outpatient therapy services are delivered in so many different settings: Hospitals, SNFs, HH Agencies, Certified Outpatient Rehabilitation Facilities (CORFs), Rehabilitation Agencies, Physician's offices, and Physical Therapists in Private Practices (PTPPs). The rule was much anticipated, and as of this writing still leaves a lot of work for the profession to do to mitigate the cuts finalized. The rule finalized a reduction in the conversion factor and changes to the relative value units of CPT® codes. Although you hear a lot of numbers thrown around, the actual impact of these changes is difficult to estimate since it depends on a number of factors including locality of the practice, patient mix, and the code utilization of a practice. There were a few bright spots, however, since CMS added Remote Physiological Monitoring (RPM) codes and agreed with APTA on how the CQ modifier (to indicate the de minimus standard was met) should be applied. Finally, CMS shed light on how the 15% assistant reduction would be applied to the fee schedule amount; it was positive, mitigating the actual assistant reduction to 12%. Table 3 on page 13 provides more information.

References

1. Centers for Medicare & Medicaid Services (CMS). Medicare Program; Inpatient Rehabilitation Facility Prospective Payment System for Federal Fiscal Year 2022 and Updates to the IRF Quality Reporting Program; Payment for Complex Rehabilitative Wheelchairs and Related Accessories (Including Seating Systems) and Seat and Back Cushions Furnished in Connection With Such Wheelchairs. 86 FR 42362. August 4, 2021. Available at: https://www.federalregister.gov/documents/2021/08/04/2021-16310/medicare-program-inpatient-rehabilitation-facility-prospective-payment-system-for-federal-fiscal.
2. Centers for Medicare & Medicaid Services (CMS). Medicare

Program; Prospective Payment System and Consolidated Billing for Skilled Nursing Facilities; Updates to the Quality Reporting Program and Value-Based Purchasing Program for Federal Fiscal Year 2022; and Technical Correction to Long-Term Care Facilities Physical Environment Requirements. 86 FR 42424. August 4, 2021. Available at: https://www.federalregister.gov/documents/2021/08/04/2021-16309/medicare-program-prospective-payment-system-and-consolidated-billing-for-skilled-nursing-facilities.

3. Centers for Medicare & Medicaid Services (CMS). Medicare Program; Hospital Inpatient Prospective Payment Systems for Acute Care Hospitals and the Long-Term Care Hospital Prospective Payment System and Policy Changes and Fiscal Year 2022 Rates; Quality Programs and Medicare Promoting Interoperability Program Requirements for Eligible Hospitals and Critical Access Hospitals; Changes to Medicaid Provider Enrollment; and Changes to the Medicare Shared Savings Program. 86 FR 44774. August 13, 2021. Available at: https://www.federalregister.gov/documents/2021/08/13/2021-16519/medicare-program-hospital-inpatient-prospective-payment-systems-for-acute-care-hospitals-and-the.
4. APTA -Geriatrics Task Force On Best Practice. Guiding Principles for Best Practices in Geriatric Physical Therapy. Available at: https://geriatricspt.org/pdfs/Guiding%20Principles.pdf.
5. PACIO Project. Available at: http://pacioproject.org/.
6. Centers for Medicare & Medicaid Services (CMS). Medicare and Medicaid Programs; CY 2022 Home Health Prospective Payment System Rate Update; Home Health Value-Based Purchasing Model Requirements and Model Expansion; Home Health and Other Quality Reporting Program Requirements; Home Infusion Therapy Services Requirements; Survey and Enforcement Requirements for Hospice Programs; Medicare Provider Enrollment Requirements; and COVID-19 Reporting Requirements for Long-Term Care Facilities. 86 FR 62240. November 9, 2021. Available at: https://www.federalregister.gov/documents/2021/11/09/2021-23993/medicare-and-medicaid-programs-cy-2022-home-health-prospective-payment-system-rate-update-home.
7. Centers for Medicare & Medicaid Services (CMS). Medicare Program; CY 2022 Payment Policies Under the Physician Fee Schedule and Other Changes to Part B Payment Policies; Medicare Shared Savings Program Requirements; Provider Enrollment Regulation Updates; and Provider and Supplier Prepayment and Post-Payment Medical Review Requirements. 86 FR 64996. November 19, 2021. Available at: https://www.federalregister.gov/documents/2021/11/19/2021-23972/medicare-program-cy-2022-payment-policies-under-the-physician-fee-schedule-and-other-changes-to-part.
8. Public Law No: 116-260. H.R. 133- Consolidated Appropriations Act, 2021. Available at: https://www.congress.gov/bill/116th-congress/house-bill/133/text.
9. Centers for Medicare & Medicaid Services (CMS). Medicare and Medicaid Programs, Basic Health Program, and Exchanges; Additional Policy and Regulatory Revisions in Response to the COVID-19 Public Health Emergency and Delay of Certain Reporting Requirements for the Skilled Nursing Facility Quality Reporting Program. 85 FR 27550. May 8, 2020. Available at: https://www.federalregister.gov/documents/2020/05/08/2020-09608/medicare-and-medicaid-programs-basic-health-program-and-exchanges-additional-policy-and-regulatory.

Ellen R. Strunk is President and Owner of Rehab Resources & Consulting, Inc., a company providing consulting services and training to providers in postacute care settings with a focus on helping customers understand the CMS prospective payment systems. She also lectures nationally on the topics of pharmacology for rehabilitation professionals, exercise and wellness for older adults, and coding/ billing/ documentation to meet medical necessity guidelines and payer regulations.

In Remembrance

Remembering those APTA Geriatrics members who left us in 2021

Hazel V Adkins, CA
Susan S. Adler, IL
Karen Michelle Arn, FL
Eric A. Behets, PA
Alexander Samuel Burgess, OH
Ibrahim Hadge Chapeyama, MD
Jessica Gail Darnell, TN
Nell Loving Deaver, NC
Karen Ann Donahue, AZ
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Wylie J. High, CO
Jaon Hopkins-Casby, MA
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Jane S. Mathews-Gentry, ME
Pamela Mullens, WA
Dorothy A. M. Nelson, WA
Stephanie Perdue-Wetmore, MT
Margaret Z. Raphael, NY
Joseph A. Rock, MD
Glory Y. Sanders, GA
Tracy Sawyer, NY
Debra A. Scheider, NY
Susan Goldman Shaw, CA
Ryan Patterson Webb, VA
Brian George Williamson, NY
Lawrence M. Yack, VA
Carol Hamilton Zehnacker, MD

Table 1. Themes from the FY 2022 IRF, SNF and LTCH PPS Final Rules

	Inpatient Rehabilitation Facility	Skilled Nursing Facility	Long-Term Care Hospital
Payment Updates	Estimated increase in aggregate payments of $130 million.	Estimated increase in aggregate payments of $410 million.	Estimated increase in aggregate payments of $42 million.
PPS Updates Adjustments	CMS finalized updates to the case-mix group relative weights and average length of stay values used in determining IRF rates. They intend to apply them in a budget-neutral manner, so they estimate 97.3% of IRFs would see less than a 5% change in payments. Less than 2% were see a change >15% and <1% would see an increase in payments of 5-15%.	In the proposed rule, CMS shared information from their monitoring of the Patient Driven Grouper Model (PDPM) system. They found the actual expenditures during the first year of the PDPM were greater than the expected expenditures, and as a result a parity adjustment would be needed. They asked SNF's to weigh in on how that adjustment should be taken. In the final rule, they deferred to reduce the rates this year and said they would address it in next year's rule.	CMS finalized their proposal to use FY 2019 claims data – rather than FY 2020 claims data – to set the LTCH payment rates. They acknowledge that FY 2020 claims reflected significant changes in inpatient hospital utilization due to the COVID-19 public health emergency. However, they believe that there will be lower risk of COVID-19 infection and fewer hospitalizations due to the high rate of vaccination in the Medicare population and effectiveness of the vaccines.
Quality Reporting Program (QRP)	One new measure was added: *COVID-19 Vaccination Coverage among Healthcare Personnel.* Beginning October 1, 2021, IRFs must begin collecting this information at least one week per month and submit it to the CDC's NHSN system. Failure to report this information may result in a 2% reduction in payments in FY 2024.	Two new measures were added: 1. *COVID-19 Vaccination Coverage among Healthcare Personnel.* Beginning October 1, 2021, IRFs must begin collecting this information at least one week per month and submit it to the CDC's NHSN system. Failure to report this information may result in a 2% reduction in payments in FY 2024. 2. *SNF Healthcare Acquired Infections (HAI) Requiring Hospitalization.* This measure reports the percentage of SNF patients who are admitted from to the hospital with an infection that is acquired in the SNF. The measure is calculated using claims, so there is no additional requirements for the SNF.	One new measure was added: *COVID-19 Vaccination Coverage among Healthcare Personnel.* Beginning October 1, 2021, LTCHs must begin collecting this information at least one week per month and submit it to the CDC's NHSN system. Failure to report this information may result in a 2% reduction in payments in FY 2024. The following measures will begin being publicly reported in March 2022: *Ventilator Liberation Rate for the PAC LTCH QRP* and *Compliance with Spontaneous Breathing Trial (SBT) by Day 2 of the LTCH Stay*
Value Based Purchasing (VBP) Program	NA	The Consolidated Appropriations Act of 2021[8] directed the Secretary of HHS to add up to 10 new measures to the SNF VBP. A list of potential measures was included in the rule which included 5 functional outcomes measures and one patient experience measure, among others.	NA
FHIR and Digital QM	CMS sought feedback on their future plans to define digital quality measures (dQMs) for the PAC QRPs, and the potential use of the Fast Healthcare Interoperable Resources (FHIR) for dQMs. In the final rule, CMS stated they would continue to work with stakeholder to coordinate and information them of their efforts to leverage health IT standards.		
Closing the Health Equity Gap	CMS sought feedback on how they could revise measure development and collection of information that would address gaps in health equity. After receipt of comments, they announced that they hope to provide measure results to providers in a stratified fashion, specifically by race and ethnicity. They believe providing PAC providers with this information will help them understand how they are performing with respect to certain patient risk groups.		

Table 2. Themes from the CY 2022 HH PPS Final Rule

Payment Updates	Estimated increase in aggregate payments of $570 million.
PPS Updates Adjustments	In the proposed rule, CMS shared information from their monitoring of the Patient Driven Grouper Model (PDGM) system. They solicited comments on a potential repricing methodology for determining the difference between assumed versus actual behavior change on aggregate expenditures under PDGM. The Bipartisan Budget Act of 2018 required CMS to evaluate the PDGM system and make adjustments for what they predicted 'would be' behavioral adjustments by HH providers once PDGM were implemented. CMS indicated in the Final Rule that the would continue to communicate with stakeholders through future notice and comment about the methodology for determining assumed versus actual behavior change. For calendar year 2022, CMS recalibrated the HH PPS case-mix weights, which included changes to the functional levels and comorbidity adjustment subgroups that are used to calculate PDGM rates. However, CMS elected to maintain the same Low Utilization Payment Adjustment (LUPA) thresholds for CY 2022.
Quality Reporting Program (QRP)	Removed: *Drug Education on All Medications Provided to Patient/Caregiver During All Episodes of Care* due to measure performance being so high that meaningful distinctions between HH agencies cannot be made. Replaced: *Acute Care Hospitalization During the First 60 Days of Home Health (NQF #0171)* and *Emergency Department Use Without Hospitalization During the First 60 Days of Home Health (NQF #0173)* with the *Home Health Within Stay Potentially Preventable* measure Begin publicly reporting in April 2022: *Percent of Residents Experiencing One or More Major Falls with Injury* and *Application of Percent of Long-Term Care Hospital Patients with an Admission and Discharge Functional Assessment and a Care Plan that Addresses Function (NQF #2631)* measures
Value Based Purchasing (VBP) Program	CMS finalized its decision to end the HH VBP Demonstration Program in its original 9 states effective 12/31/2021 and expand the Model to all 50 states effective January 1, 2023. Their evaluation found that in the original 9 states, participants' achieved an average 4.6% improvement in quality scores and an average annual savings of $141 million to Medicare. CMS will use 2022 to provide technical assistance to HH providers. Of note for physical therapists is that 35% of a HH agency's score comes from outcomes measures, two of which are related to change in self-care ability and change in mobility status.
Other Regulatory Changes	HH Aide Supervision: CMS finalized its proposal to allow the supervisory visit to be completed virtually, although no more than 2 virtual assessments/HH agency in a 60-day period may occur. The equipment used for a virtual visit must include audio and video to allow for 2-way, real-time interactive communication. Additionally, for supervisory visits conducted in person, the HH aide no longer has to be present. OTs and Initial, Comprehensive Assessments: OT's are now allowed to conduct these initial, "Start of Care" assessments as long as skilled nursing is not initially included and either PT or ST are also included.
Revised Compliance Dates for Assessment Tool	In May 2020, CMS published an interim final rule with comment period titled "Medicare and Medicaid Programs, Basic Health Program, and Exchanges; Additional Policy and Regulatory Revisions in Response to the COVID-19 Public Health Emergency and Delay of Certain Reporting Requirements for the Skilled Nursing Facility Quality Reporting Program" (85 FR 27550)[9] – also referred to as "IFC-2". This rule effectively delayed the implementation of the Outcome and Assessment Information Set (OASIS-E), the IRF-Patient Assessment Instrument (PAI) V4.0 and the LTCH Continuity Assessment and Record of Evaluation (CARE) Data Set (LCDS) V5.0 until at least one full calendar year (for HH) and one full fiscal year (for IRF, LTCH) after the end of the COVID-19 PHE. These assessment instruments include items to assess the Transfer of Health Information and Standardized Patient Assessment Data Elements (e.g., hearing, vision, race, ethnicity, transportation). However, CMS proposed in the HH PPS proposed rule to revise the compliance date set by the IFC-2 so that the information could be collected earlier. They believe the PHE's disproportionate impact on minority populations demonstrates the importance of analyzing this kind of information and would give PAC providers the information they need to assess their quality of care. The proposal was finalized, and as a result: HHAs will begin using the OASIS-E for Starts of Care/Resumptions of Care January 1, 2023; IRFs will begin using the IRF-PAI V4.0 for admissions October 1, 2023; LTCHs will begin using the IRF-PAI V4.0 for admissions October 1, 2023.

Table 3. Themes from the CY 2022 Medicare Physician Fee Schedule Final Rule

Conversion Factor	Reduction: of 3.75% In 2021, the conversion factor was $34.89. For services delivered on/after January 1, 2022, the conversion factor will be $33.58 unless Congress takes action to change it.
Relative Value Units (RVUs)	Each of the CPT® codes billed by physical therapists consists of "relative value units" of work, practice, and malpractice. Periodically these values are revised and reweighted. The final rule increased the RVUs for physical therapy codes in 2022, including the RVUs for physical therapy evaluation by 0.02 for the 3 levels of Evaluation and by 0.04 for Re-evaluation. Other codes seeing an increase include 97761 and 97763. Some codes will see a decrease in RVUs, including 97530. Taken as a whole, the increases aren't enough to completely offset the cuts caused by the lower conversion factor. CMS will also update the clinical staff labor input in the direct practice expense formula over 4 years, from 2022 to 2023.
PTA Differential	Effective January 1, 2022, for services delivered by physical therapist assistants that meet the *de minimus* standard, CMS will pay 85% of the full fee schedule amount. However, as a result of advocacy, CMS refined the policy to address stakeholder concerns that the previous policy created a financial incentive for therapists to ensure that PTAs provided services in *exactly* 15 minute increments. Overall, the *de minimis* standard would continue to be applicable in the following scenarios: • When the PTA/OTA independently furnishes a service, or a 15-minute unit of a service "in whole" without the PT/OT furnishing any part of the same service; • In instances where the service is not defined in 15-minute increments, including: supervised modalities, evaluations/reevaluations, and group therapy; • When the PTA/OTA furnishes 8 minutes or more of the final 15-minute unit of a billing scenario in which the PT/OT furnishes less than eight minutes of the same service; and • When both the PTA/OTA and the PT/OT each furnish less than 8 minutes for the final 15-minute unit of a billing scenario (the 10 percent standard applies). CMS clarified that the 15% reduction from the PTA differential would be applied to the portion of the fee paid by Medicare, i.e. 80% of the fee. For example, if one unit of therapeutic exercise was paid at $25.00, then when a PTA provided this therapeutic exercise, the reduction would be taken on 80% of the $25 (or $20). The remaining 20%, the copayment owed by the patient or secondary insurance would be paid at full rate. As a result, the actual reduction to the provider payment would be $3.00 versus $3.75.
Telehealth	In the CY 2021 Medicare Physician Fee Schedule Final Rule, CMS *temporarily* added several services commonly provided by physical therapists to the Category 3 list of approved telehealth services during a PHE. APTA and its members advocated to CMS to permanently add physical therapists as approved providers of telehealth and to *permanently* add these services to its list of approved telehealth services. CMS declined to permanently add physical therapists to the approved list of telehealth providers. CMS also declined to permanently add several CPT® codes used by physical therapy to its list of approved telehealth services. However, CMS did finalize a proposal to allow physical therapists to continue to bill for the services temporarily added to the Category 3 list through December 31, 2023 – even if the PHE ends earlier.
Remote Physiological Monitoring (RPM)	The rule finalized the adoption of a new 'family' of codes for RPM. APTA was involved in the development of these 5 codes, as well as advocating to CMS to allow PTs and PTAs to bill all five of the codes. APTA has additional information about the five codes on its website at: https://www.apta.org/news/2019/01/07/new-cpt-codes-allow-pts-to-conduct-bill-for-remote-monitoring.
Direct Supervision of PTAs	PTs working in Private Practice or in physician's offices are required to provide direct supervision (i.e. in the room) when PTAs are delivering services to Medicare beneficiaries. During the PHE, that requirement has been waived and PTs can provide that 'direct' supervision using audio-visual, 2-way interactive communication. APTA and its members advocated to CMS to make this waiver permanent, but CMS declined. CMS said it would continue to consider it, but at this time, the policy remains the same. The allowance to meet the direct supervision requirement through audio-visual, 2-way interactive communication will expire at the end of the calendar year in which the PHE ends.
Therapy Threshold	Combined PT and SLP threshold for 2022 will be $2,150.00, an increase of $40 over 2021. Occupational therapy will also have a 2022 threshold of $2,150.00.

Tools and Templates for Implementing the Physical Therapy Annual Visit with Ageing Adults

by Devon Hock, PT, DPT and Michael L. Puthoff, PT, PhD

Every six months, we find ourselves in the dentist's chair for a check up on our teeth. Once a year, we might see our doctor to review our medications, talk about reducing our cardiovascular disease risk factors or to determine if there are any concerns with our health. These examples of regular, preventive visits, or check-ups with healthcare providers are meant to identify concerns early and improve our overall health. Within our current healthcare model though, who is routinely addressing movement, the ability to complete daily tasks, and quality of life? This is an especially important question for ageing adults who have higher rates of chronic disease, sarcopenia, falls, and lower physical activity levels. Of course the response most of us would have is that physical therapists should be doing this! As movement specialists focused on non-pharmacological interventions, physical therapists are well positioned to lead in the area of fitness and health.[1]

The typical physical therapy encounter is initiated after an injury, medical incident, or identification of a movement deficit. Ideally, we are emphasizing physical activity, healthy habits, non-pharmacological management of noncommunicable diseases, fall prevention and wellness in every session with ageing adults. However very few individuals receive our services in a preventive model. This is in spite of most patients viewing physical therapists as experts in health-related issues and expecting their therapist to talk to them about the importance of activity, weight management, and the avoidance of tobacco.[2]

In 2007, the American Physical Therapy Association House of Delegates released a position statement promoting annual visits with physical therapists. In 2018, the statement was updated to read that all individuals should visit a physical therapist at least annually to optimize movement, to promote health, wellness, and fitness, and to slow the progression of impairments of body functions and structures, activity limitations, and participation restrictions.[3] Results of the visit can lead to recommendations to promote health, a decision to receive formal physical therapy, or a referral to another provider.

There are multiple tools available that physical therapists can use as part of an annual visit when working with ageing adults. The Stopping Elderly Accidents, Deaths, and Injuries (STEADI) can be used to determine fall risk and guide interventions.[4] The Senior Fitness Test is used to measure the multiple areas of fitness in ageing adults.[5] The NIH Toolbox is a comprehensive set of neurobehavioral measurements with separate sections for cognitive, emotional, sensory, and motor functions with normative data for ageing adults.[6] The Adult Functional Independence Test (A-Fit) includes 15 measures that address multiple areas such as posture, strength, balance, mobility, and endurance.[7] There are also single measures of function, such as gait speed, grip strength, sit to stand tests, and floor transfers that relate to overall health and mobility. All of these have value with their own strengths and drawbacks.

An ideal screening tool for annual visits aimed at ageing adults should provide information across body systems and measure multiple aspects of function. The tool should be reliable, valid, and with minimal floor and ceiling effects. The overall screen should be brief to allow for efficiency and low cost delivery in the clinical setting. It should also guide therapists in the next steps to take, based on the results, and detect change over time. Finally an added bonus would be a tool that could be completed virtually, not just because of the current pandemic, but to provide better access to those in rural settings, where access to physical therapy is lacking, or when travel outside the home is difficult.

The Annual Physical Therapy Visit for the Ageing Adult

In 2020, these ideas led APTA Geriatrics to convene a task force to develop a template for The Annual Physical Therapy Visit for the Ageing Adult. The main focus of this visit template was to address movement and function and identify ageing adults at risk for adverse events while guiding therapists in making appropriate referral recommendations. The template was designed to comprehensively screen patients with a range of abilities using outcome measures with strong psychometric properties, predictive abilities, and normative data. The outcome measures and functional tasks included were also chosen based on ease of administration and ability to be adapted into a virtual environment if necessary. The visit was designed to be completed in 30 minutes and consists of 4 guiding forms or templates published by the APTA in 2021. These forms will be referenced through this paper and can be found at www.apta.org/patient-care/interventions/annual-checkup. The forms are posted in a Microsoft Word format to give therapists the flexibility

to modify them to meet their needs.

The visit structure first begins with an **Initial Intake Form** intended to be completed by the client, prior to their annual visit to assist the therapist in guiding the session. The therapist reviews this information, use it to guide the interview process, and determines any necessary modifications needed to safely and successfully complete the annual visit.

Second, the main template or **Data Sheet** [on the following pages] is used to record typical interview questions and the client's outcome measure performance scores. It consists of interview questions, a general movement screen which assesses joint integrity, posture, upper extremity functional movements, and outcome measures to include the Chair Sit and Reach, Occiput to Wall Test, the Short Physical Performance Battery, Two Minute Walk Test, and Timed up and Go Test. These measures provide data on flexibility, posture, bone health, static and dynamic balance, gait speed, endurance, and walking ability as well as lower extremity strength and fall risk. Using questions from the intake form and performance measures in the data sheet, the therapist can implement the STEADI fall prevention tool.

The third template includes a **Report Card** for the therapist to fill out and provide to the client at the completion of the visit. This allows the client to have an overview and explanation of their results; a section to document personal goals; and their individualized, recommended follow up plan created by the administering therapist. This report card summary can easily be provided to other members of the patient's health care team such as their primary care physician.

In the event that a client requires a specific referral to another health care provider or community program, the task force created a fourth and final template: the **Referral Form**. The referral can be presented by the client to the appropriate community service providers. The referral template can be regularly updated by the therapist to reflect the community services available at that time. For example, if there are group fitness classes or fall prevention programs in the community, information about these can be added to the referral template form.

An **Instruction Manual** to assist therapists in successfully implementing the annual visit was also created by the task force. The Instruction Manual includes background information, justification for the annual visit, directions for each outcome measure, links to normative data, suggestions for additional screening tools and community resources. Guidance is provided on how to implement the visit in both a clinical setting and a virtual environment, as appropriate. If a therapist is considering using a virtual annual visit, some key points highlighted in the Instruction Manual include ensuring the client is comfortable with technology and has the ability to set up some of the screening tools in their home, and that someone is available to assist with the camera during the screening process. While the virtual visit may not provide exactly the same information as a face-to-face encounter, it can be a great entry path into physical therapy.

Using the Results of the Annual Visit

One of the main goals of the annual visit is to identify health concerns and guide necessary referrals to physical therapy, other healthcare providers, or community services. These recommendations could be a few exercises the client could safely perform at home as part of a home exercise program. It could be a referral to a community based program and/or community services to address any social determinants of health. Resources such as the Area Agencies on Aging or National Council on Aging are a great way to get individuals involved in local programming such as A Matter of Balance classes, Silver Sneakers, nutrition classes, chronic disease management courses, or appropriate fitness classes at a local center. If the client's need is greater than a community based program, the therapist may consider referring the client to a formal course of physical therapy services. Through the annual visit, therapists may detect red flags that require a medical referral and follow up with a physician. Since this is designed to be an annual visit, the results can be used to track their general well-being and functional movement status from year to year.

Implementation and Marketing of the Annual Visit

While there is a lot of excitement and support for annual visits, this model of care is different from how most therapists practice. The annual visit is about screening areas of major concerns and making recommendations. At the end of the visit, the therapist may have identified deficits in function but possibly not the reason why the deficit is present. Nor is there time to provide a comprehensive intervention. Instead, the annual visit is about referring those at high risk for further assessment and intervention; coaching skills and behavioral interventions must be demonstrated by the therapist to encourage all individuals to be focused on their overall health and wellness.

Most therapists do not have individuals lining up at their doors for an annual visit. In order to build this area of practice, there needs to be a commitment to education and outreach. While some of this can happen at a macro-level through national and state level professional organizations, ultimately individual clinics and therapists will need to champion the annual visit at the community level. The APTA has published recommendations on their website on how to implement an annual visit that can be useful. The first step is to know the audience. Is the therapist wanting to promote the annual visit in a senior living community, a local fitness center, at a faith based organization, through referrals from other providers, or to individuals already coming to their clinic? What is the

ultimate goal of the annual visit? One goal is impacting the overall health of the community. Other goals might be to increase awareness of a clinic, the profession of physical therapy, and drive more referrals and clients. This will guide how the outreach is designed. It might be a booth at a health fair, letters and invitations, social media, signs, or word of mouth. It could also be speaking in the community or serving on boards and task forces addressing public health and wellness in the community. There is not a single way to reach an audience. No matter the method chosen, tracking the success of the outreach can guide how future time and efforts are spent. Ask clients how they found out about your services and try to capitalize on clients' own personal network of friends and family that may have interest in an annual visit.

Reimbursement for the Annual Visit

The reimbursement model for annual visits will most likely be individuals paying out of pocket. Medicare currently reimburses for the Medicare Annual Wellness Visit[8] that covers such items as medication review, functional status, cognitive evaluation, and the review of immunization records if the visit is done under the supervision of a medical doctor. Physical therapists can be a part of the interprofessional team that conducts this visit. The overall focus on function and movement in the Medicare Annual Wellness visit is a small part of the overall screen and does not provide enough time to address all the areas physical therapists would consider in their own annual visit with an ageing adult.

In a 2021 study on patient perceptions of a physical fitness screen, over 70% of participants would pay between $1-100 to undergo the A-Fit.[9] The results are positive that participants found value in the fitness screen; in most cases, therapists will have to charge more than $100 in order to break even with their services. Charging a higher rate could be possible by promoting the possible benefits of an annual visit. Physical therapists need to also tap into the overall health and wellness marketplace to receive out of pocket payments. Some clients will pay over $100 to work with a personal trainer or receive a massage. Therapists need to hold our services out as something that is worthwhile and an investment in health. If this is done in the right way with the right clients, annual visits could be a profitable endeavor. Some therapists might choose to offer annual visits at a break even amount or even as a loss leader in order to draw clients to their clinics. The proper pricing of the annual visit must be part of an overall business plan, along with clear goals, and tracking of outcomes from the annual visit.

The Future of the Annual Visit

It is too early to say whether annual visits with a physical therapist will become a service that ageing adults will seek out or if they will lead to meaningful benefits. In a study of 37 adults over the age of 50, participants strongly agreed that undergoing the A-Fit was a beneficial service and 58% would repeat the screen in the future. On average, over 5 deficits in function were found in this overall healthy population.[9] In a study on the Functional Fitness MOT, over half of the participants found value in the screen.[10] Johnston YA et al (2018) found that using the STEADI across a large healthcare system led to lower rates of fall-related hospitalization.[11] These small studies demonstrate some support for further exploration of annual visits with ageing adults.

There are mixed results when it comes to the benefits of annual visits and health screens in the medical model. A cohort study found that the Medicare Annual Wellness Visit led to almost 20% of participants receiving low value follow up testing and higher costs to the healthcare system.[12] In another study, the Medicare Annual Wellness visit led to a 5.7% reduction in total healthcare costs with the greatest effect for those with poorer health.[13] In a study focused on younger adults (aged 30-49 years), health checkups led to no change in indicators of chronic disease risk.[14] Physical therapists need to be aware of this literature, the questions that remain about the overall benefits of annual visits, and some of the push back they may receive with an annual visit.

Data collection and informatics will be essential to the future of the annual visit. The template created by our task force can provide a common set of outcome measures to use across the country. While therapists do have the ability to adjust the forms, there is value in having a common set of outcomes used across populations. With this information, there is an opportunity to create a national database to determine the benefit and effectiveness of physical therapy annual visits in the ageing adult population. The task force hopes that the APTA and APTA Geriatrics will help create such a database that physical therapists can contribute to in the future.

Next Steps

The APTA and APTA Geriatrics have created a useful resource for therapists to begin using annual visits with the ageing adult population. The task force believes the resources represent the best evidence balanced with the ability to easily implement in the clinical or virtual setting. Documents are posted in a Word format to allow clinicians to adjust and revise the forms to meet their needs. Therapists should explore these resources and consider if annual visits would be of value in their community. The task force hopes this tool will lead to greater implementation of annual visits and further exploration on whether or not these visits lead to long term benefits in the ageing adult population.

References

1. Dean E, Skinner M, Myezwa H, et al. Health Competency Standards in Physical Therapist Practice. Phys Ther. 2019;99(9):1242-1254.

2. Black B, Ingman M, Janes J. Physical Therapists' role in health promotion as perceived by the patient: Descriptive Survey. Phys Ther. 2016;96(10):1588-1596.
3. American Physical Therapy Association. Annual Visit with a Physical Therapist HOD P06-18-22-30. http://www.apta.org/uploadedFiles/APTAorg/About_Us/Policies/Practice/AnnualVisit.pdf. Accessed September 21, 2021.
4. Centers for Disease Control and Prevention. STEADI (Stopping Elderly Accidents, Death and Injuries) Tool Kit for Health Care Providers. https://www.cdc.gov/steadi/index.html. Accessed September 21, 2021.
5. Rikli RE, Jones CJ. Senior Fitness Test Manual. 2nd ed. Champaign, IL: Human Kinetics; 2012.
6. Gershon RC, Wagster MV, Hendrie HC, Fox NA, Cook KF, Nowinski CJ. NIH toolbox for assessment of neurological and behavioral function. Neurology. 2013;80(11 Suppl 3).
7. Laflin M, Lewis C. Functional standards for optimal aging: the development of the Moving Target Screen. Top Geriatr Rehabil. 2017;33(4):224-230.
8. Colburn JL, Nothelle S. The Medicare Annual Wellness Visit. Clin Geriatr Med. 2018;34(1):1-10.
9. Puthoff M. Participants' Perceptions and the Implementation of a Physical Fitness Screen for Aging Adults. J Geriatr Phys Ther. 2021;44(1):E1-E8.
10. de Jong LD, Peters AD, Gawler S, et al. The appeal of the Functional Fitness MOT to older adults and health professionals in an outpatient setting: a mixed-method feasibility study. Clin Interv Aging. 2018;13:1815-1829.
11. Johnston YA, Bergen G, Bauer M, et al. Implementation of the Stopping Elderly Accidents, Deaths, and Injuries Initiative in Primary Care: An Outcome Evaluation. Gerontologist. 2018.
12. Ganguli I, Lupo C, Mainor AJ, et al. Assessment of Prevalence and Cost of Care Cascades After Routine Testing During the Medicare Annual Wellness Visit. JAMA Network Open. 2020;3(12):e2029891-e2029891.
13. Beckman AL, Becerra AZ, Marcus A, et al. Medicare Annual Wellness Visit association with healthcare quality and costs. Am J Manag Care. 2019;25(3):e76-e82.
14. Bjerregaard A-L, Dalsgaard E-M, Bruun N-H, et al. Effectiveness of the population-based 'check your health preventive programme' conducted in a primary care setting: a pragmatic randomised controlled trial. J Epidemiol Community Health. 2021:jech-2021-216581.

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Annual Physical Therapy Visit for Aging Adult

Name: Click here to enter text. **Date:** Click to enter a date. **Visit Type:** ☐ In Person ☐ Virtual

Interview Questions

Reason for seeking the screen. Include client's goals for participation.

Click here to enter text.

Review of current exercise and physical activity.

Total minutes per week of physical activity (minutes/day x days/week). Click here to enter text.

Current resources for physical activity and exercise.

Click here to enter text.

Review of other health habits.

Click or tap here to enter text.

Discussion of past medical history and medications from health history form.

Click or tap here to enter text.

Discussion of any issues dealing with health insurance, social support, transportation, and access to food or housing that would necessitate a referral.

Click or tap here to enter text.

Resting Vitals

Heart Rate: Click here to enter text. bpm

Blood Pressure: Click here to enter text. mm Hg

Pulse Oximetry: Click here to enter text. % (optional)

☐ **Based on responses on intake form and vital signs, the patient is safe to participate in the physical performance tests.**

General Movement Screen

Movement	Not Impaired	Impaired	Unable to Perform	Symptom Provocation
Be seated in a chair.	☐	☐	☐	☐
Turn your head side-to-side, then up and down.	☐	☐	☐	☐
Stand up from the chair without using your arms, if possible.	☐	☐	☐	☐
Raise your arms overhead, then reach behind your back, then reach over your shoulder.	☐	☐	☐	☐
Lift a five-pound object from waist height and put it on a shelf 12 inches above shoulder height.	☐	☐	☐	☐
Squat down as if you were going to tie your shoestring.	☐	☐	☐	☐
Turn 360 degrees one way and then 360 degrees another.	☐	☐	☐	☐
Walk over to a bed or treatment table and lay down flat on your back. Roll to one side and then the other. Stand up from the bed or table.	☐	☐	☐	☐
Get on the floor, lay down flat on your back and then return to a standing position. not Use chair for support if needed.	☐	☐	☐	☐
Need support to complete ☐ Yes ☐ No Floor transfer: Click here. secs	☐	☐	☐	☐
Sit back down in the chair.	☐	☐	☐	☐
Chair Sit and Reach	Distance from toes to fingertips: __ cm			
Occiput to Wall Test	Distance: __ cm			

American Physical Therapy Association / 2

Short Physical Performance Battery		
Static Standing Balance Test	Side-by-side: __ secs Semi-tandem: __ secs	Tandem: __ secs Single-leg stance: __ secs
Gait Speed – 4-meters (13.12 feet)	Time: __ secs	Calculated speed: __ m/s
Five-Time Sit-to-Stand	Time: __ secs	
SPPB Score		Click here./**12**
Two-Minute Walk Test	Length of loop: Click here. Partial distance: Click here.	No. of Loops: Click here. **Total distance:** Click here. HR: __ BP: __ RPE: __
Two-Minute Step Test (If environment does not allow walk test)	Number of steps: Click here.	HR: __ BP: __ RPE: __
Timed Up and Go Test	Attempt 1: __ secs	Attempt 2: __ secs

Summary of Findings and At-Risk Areas

Referrals

☐ Physical therapy

☐ Other health care providers

☐ Physical activity program

☐ Follow-up to annual checkup

Recommendations

Click here to enter text.

Physical Therapist Signature

Click to enter a date.
Date

Click here to enter text.
Physical Therapist Name

Template Last Updated: 11/20/2020
Contact: practice@apta.org

Optimization of Rehabilitation into the Oncology Continuum of Care

Stephanie Prinster, PT, DPT and Kathy Brewer, PT, DPT, MEd

Three out of every 4 people over the age of 65 will be a cancer survivor. The median age at the time of a cancer diagnosis is 68 years old with 56% of all cancer diagnoses occurring in those over the age of 65 and in the last 30 years the incidence of cancer has increased by 26% in the greater than 65-year-old population compared to just 10% in the less than 65-year-old population. As of January 2019, there were 16.9 million cancer survivors in the United States, and it is projected to increase to 22.2 million by 2030.[3] Approximately 1.9 million new cases of cancer diagnoses will be made in 2021.[1] Since 1991 there has been a continuous decline in cancer mortality with an overall drop of 31% due to major advances in cancer screening, diagnosis, and treatment. Those over age 85, the oldest old, are in the fasted growing group of cancer survivors, and are projected to be at 4.7 million cancer survivors by 2040.[2] Older adult cancer survivors have increased rates of co-morbidities, are more likely to start cancer treatment with pre-morbid disablement, and are more likely to have cancer treatment-related toxicity.[3] This is creating a continually expanding population of cancer survivors. This creates an ever-growing population of patients with unique rehabilitation needs for which physical therapists must be ready to provide.

Older adults are more likely to be diagnosed with cancer and have a higher incidence of other medical co-morbidities that will affect their ability to adjust to the demands of cancer treatments such as cardiovascular disease, diabetes, obesity, and arthritis.[4] Treatment of older adults with cancer is often complicated by cognitive impairment, frailty, functional loses, and social isolation.[5] A cancer diagnosis can also further increase the risk of falls, mortality, and severity of injuries in the older adult population.

In the Prospective Surveillance Model of Care, rehabilitation would begin at the cancer diagnosis to provide a multidimensional comprehensive assessment along with other healthcare professionals to address the emotional, psychological, physical, and nutritional needs of the patient. The patient would also be re-assessed, at least quarterly, for changes and declines related to their cancer treatment. This is often difficult to achieve due to access, cost, and the limits on visits to physical therapy.[3] Physical therapy is often referred to as a restorative care when the patient is functionally failing or dealing with new onset of cancer related side effects. The opportunities are endless to help anticipate these changes, provide education and early interventions, and continue to provide care throughout the course of their cancer treatments.

Cancer should be considered a critical illness throughout all phases of treatment and recovery. For people with cancer, the journey may take on different challenges and remissions over the rest of the lifespan. While medical treatment focuses on the disease, physical therapists focus on symptom management, function, and quality of life. Oncologic rehabilitation can be valuable in all the different stages of care: preventative, supportive, restorative, and palliative.

Intervention Strategies for Patients with Cancer

Preventive

During the preventative stage of oncologic rehabilitation physical therapy is "assessing functional status prior to the onset of chemotherapy and monitoring for functional change during treatment is an optimal strategy to identify and manage emerging functional impairments."[6] This is also an opportunity to identify other medical co-morbidities the patient is undergoing care for and address the multidimensional needs of the patient. In combination of other supportive services such as nutritional and emotional services the patient is less likely to deal with toxic detriments of chemotherapy and is more likely to preserve their functional capacity. Exercise has been shown to delay tumor growth including metastatic lesions.[7] The American Cancer Society along with the American College of Sports Medicine recommend a minimum of 150 minutes of moderate level intensity each week for the cancer survivor. This provides an opportunity for patient education regarding the benefits of exercise and an exercise prescription consistent with patient goals, activity preferences and lifestyle behaviors, with consideration of current illness limitations.

Supportive

In supportive therapy services, therapy can continue to help patients undergoing chemotherapy, radiation, and surgical procedures associated with cancer treatments. Physical therapy can address energy conservation needs, adjust exercise prescriptions, and continue to address the growing concern of safety and fall prevention. Ideally, patients undergoing cancer treatments would be assessed quarterly for fall risk concerns, especially in

the geriatric patient. The Fullerton Advanced Balance Scale demonstrated psychometrics in cancer survivors indicating those who score below 25 are at a high risk of falls.[8] Between 14 and 22% have some form of balance or gait abnormality. Some other tests and measures that have not been specifically researched in cancer populations but that have demonstrated fallers in the geriatric population would be the Mini-best Test, Four Square Step test, and the Short Physical Performance Battery. Cancer survivors are more likely to have difficulty with walking a quarter mile (21-22%) compared to those without a history of cancer (8.7%).

Restorative

There are more than 100 commonly used chemotherapeutic agents used in cancer care; that number continues to grow with advances in medicine.[9] The goal of chemotherapeutic medications is to affect cancer cell proliferation by either damaging or killing cancer cells with least possible harm to normal cells and prevent metastatic disease sites. Unfortunately, there is often collateral damage which can create a variety of toxic events in the cancer patient's body. Some of the most common toxicities seen are myelosuppression, Chemotherapy Induced Peripheral Neuropathy (CIPN), cardiotoxicity, cognitive impairments also known as "chemo-fog" or "chemo-brain" and Cancer Related Fatigue (CRF). The older adult is highly vulnerable to neurotoxic and cardiotoxic side effects due to decreased stem cell reserve and plasticity as well as the other medical co-morbidities that they may already have.[10] This leaves them vulnerable to decreased cardiopulmonary capacity, increased confusion, and decreased peripheral sensation. Most patients will have some degree of toxicity following cancer related treatments. Continuing to improve the patient's quality of life throughout their cancer treatment journey by addressing the patient's symptoms is something we, as physical therapists, need to continue to advocate for and address in comprehensive assessment of the patient's needs.

More than 50% of cancer patients will receive some form of radiation along with their chemotherapeutic treatments which can increase their risk of radiation fibrosis, cording, and treatment burns. Most patients will not return to their baseline following chemotherapy and/or radiation treatments without supportive services such as physical therapy. Collaboration with the oncology care team and a holistic approach is key for maximizing the individual patient's potential for recovery. Some patients will also require surgical interventions and potentially amputation which will lead to many lifestyle changes and modifications. They may require additional referrals such as occupational therapy, social workers, and equipment resources. Lymphedema is a common post-treatment side effect which will require life-long management. Following cancer care habilitation therapy may be necessary to adjust to a new lifestyle or new co-morbidities from the cancer treatments. With cardiopulmonary toxicity being a common side-effect of chemotherapy, especially in the geriatric cancer survivor, patients may require cardiac rehab following completion of cancer treatment.

Palliative

"Pain is one of the most feared and debilitating complications of cancer." Pain can be directly related to the disease itself, a side-effect of the various treatments, or indirectly from other co-morbidities that may not be associated with the cancer diagnosis. Palliative treatment may be an option to help minimize pain with positioning strategies, prevent pressure injuries, or recommend adaptive equipment to improve comfort and increase the patient's ability to socialize with others. Complimentary therapies may also be indicated to reduce the patient's pain such as oncologic massage, yoga, or tai-chi. Even though treatment may not be aimed at quantity of life we can certainly assist with bringing quality to life. General deconditioning through the end of life may place additional burden on care givers, need for additional equipment and opportunity for education in strategies to modify activity and mobility. Physical therapy and our occupational therapy colleagues should be present to address these needs as they arise.

Physical therapy provides essential care for patients living with cancer

We can do better. We, as physical therapists, can continue to advocate for our patients and continue to develop our skills in treating this ever-growing patient population. As our population density continues to grow with older adults, so will our number of cancer survivors and we must be ready to provide the care they need throughout the spectrum of cancer care. We must be ready to assist from first diagnosis through years of survivorship. So where do you start? Encourage screening at physicians' offices, routine cancer care centers, and in our clinics. The STEADI is a tool used to identify those at risk for falling and increased weakness, it is universal, and available for use by all healthcare providers.

With the increase in social isolation from the pandemic patients need us now more than ever. More than 75% of those over 65 have a history of cancer or are currently undergoing cancer care; we need to be directly engaged in care for this population and continue to be deliberative about our delivery of care for symptom management, fall prevention, improving quality of life, and making function a priority in the recovery process for people with cancer.

References

1. Facts & Figures 2021 Reports Another Record-Breaking 1-Year Drop in Cancer Deaths. Accessed September 9, 2021. https://www.cancer.org/latest-news/facts-and-figures-2021.html.
2. DeSantis CE, Miller KD, Dale W, Mohile SG, et al. Cancer Statistics for Adults Aged 85 Years and Older, 2019. Ca Cancer J Clin. 2019; 69:452-467. Doi:10.3322/caac.21577.
3. Cheville AL, Mustian K, Winters-Stone K, Zucker DS, et al. Cancer

Rehabilitation: An Overview of Current Need, Delivery Models, and Level of Care. Phys Med Rehabil Clin N Am 28 (2017) 1-17. Doi: 10/1016/j.pmr.2016.08.001.
4. Guo Y, Fu JB, Guo H, Camp J, Shin KY, et al. Postacute Care in Cancer Rehabilitation. Phys Med Rehabil Clin N Am 28 (2017) 19-34. Doi: 10.1016/j.pmr.2016.09.004.
5. Williams GR, Mackenzie A, Magnuson A, et al. Comorbidity in older adults with cancer. J Geriatr Oncol. 2016;7:249-257. doi: 10.1016/j.jgo.2015.12.002.
6. Stout N, Hile E. Geriatric Oncology: Aligning Across Speciality Practice to Meet the Needs of Cancer Survivors. CSM Lecture. February 2020.
7. Irwin ML. ACSM's Guide to Exercise and Cancer Survivorship. 2012. ISBN-13: 978-0-7360-9564-8.
8. Huang MH, Shilling T, Miller KA, et al. History of falls, gait balance, and fall risks in older cancer survivors living in the community. Clinical Interventions in Aging 2015:10 1497-1503. Doi: 10.2147/CIA.S89067.
9. Drugs Approved for Different Types of Cancer. Accessed September 9, 2021. https://www.cancer.gov/about-cancer/treatment/drugs/cancer-type.
10. Applications in Geriatric Oncology. Geriatric Workforce Enhancement Program Lecture Series. Accessed September 9, 2021. https://www.hopkinsmedicine.org/gec/series/cancer_aging.html.

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Two Minute Step Test: Review of Psychometric Properties

by Riley Caughlin, MS, SPT; Bayler Andrews, SPT; Mike Richardson, PT, DPT, DHSc; Leslie Ayres, PT, DPT; and Kenneth Miller PT, DPT

The 2 Minute Step Test (2MST) is an outcome measure that was developed as a component of the Senior Fitness Test (SFT). The SFT consists of the 2MST, 30-Second Chair Stand, Arm Curl, 6-Minute Walk, Chair Sit-and-Reach, Back Scratch, and 8-Foot Up-and-Go. The 2MST has become an outcome measure to assess fitness.[1] Unfortunately, recent research has noted that many older adults approach their maximum physiologic limit while performing routine activities of daily living (ADLs) such as climbing stairs and rising from chairs. Rikli and Jones developed the SFT to objectively measure an individual's "functional fitness." For this battery of tests, "functional fitness" is defined as the physiologic capacity to perform independently and safely everyday activities such as stair climbing, dressing, and personal hygiene without excessive fatigue.[1] For individuals performing tasks at or near their physiological functional limit, even a small deterioration in health status can be profoundly detrimental to their functional independence. The SFT was seminal in assessment and early detection of functional fitness decline in healthy older adults.

The developers of the SFT utilized the 2 Minute Step Test as an alternative to the 6 Minute Walk Test for aerobic capacity assessment when administering the SFT.[1] Since then, the 2MST has become a popular assessment tool for use with a variety of populations; it can be performed with limited space, inexpensive equipment, and time. However, there is limited psychometric data pertaining to 2MST use in populations beyond the community-dwelling older adult aged 60-94 years old. This presents generalizability and validity issues when using the 2MST in populations with specific health conditions. Bohannon and Crouch (2019) completed a systematic review of 2MST validity in the following populations: older adults, heart failure, individuals who are sedentary and those who are obese, community and facility dwelling adults, Parkinson's Disease, stroke survivors, individuals with depression, and those with osteoporosis.[2] This systematic review supports the validity and use of the 2MST in various populations however further research is still needed to support easy to reference clinical decision making.

Methods

A total of 387 articles were found in 16 databases searched; 151 articles were removed for duplication between databases and journals. The remaining 236 articles were hand searched for inclusion with the criteria of psychometric data from 2MST administration reporting as described in the Senior Fitness Test.[1] This review details the 35 studies that met this criteria. The number of articles associated with the individual populations are as follows: older adults and geriatric care: 12; pulmonary disorders: 1; cardiovascular diseases: 1; adults: 2; cancer: 1; Alzheimer's and dementia: 1; Parkinson's Disease, 1; renal disease: 2; low back pain: 2; stroke: 1; frailty: 1; sarcopenia: 1; fallers and non-fallers: 3; cognitively impaired older adults: 1.

Results

Step count data for older adults aged 60-94 years old can be found in Tables 1 and 2.[1] The 25th through 75th percentile scores represent "normative scores" for the older adult population.[3]

Older adults **aged 60-64** had a "normative score" of 91 (24) steps.

Table 1: Normative Step Counts for the Geriatric Population[1]
(n=7,183; Age Range 60-94)
Males: n= 2,135

Age Range (years)	Participants (n)	Step Count (SD)
60-64	620	91 (24)
65-69	1,084	90 (26)
70-74	1,298	84 (25)
75-79	987	84 (24)
80-84	543	75 (23)
85-89	354	70 (22)
90-94	158	58 (21)

Table 2: Normative Step Counts for the Older Adult Population[1]
(n=7,183; Age Range 60-94)
Females: n= 5,048

Age Range (years)	Participants (n)	Step Count (SD)
60-64	620	91 (24)
65-69	1,084	90 (26)
70-74	1,298	84 (25)
75-79	987	84 (24)
80-84	543	75 (23)
85-89	354	70 (22)
90-94	158	58 (21)

- Older adults who were defined as "moderate functioning" via the Composite Physical Function Scale achieved step count scores detailed in Table 3.[4]
- Male older adults aged 60-64 had a normative score of 92.6 (20.8) steps.

Normative values for individuals with **heart failure** are in Table 4.[5]

- Individuals with **NYHA Class 1-4 heart failure** had a normative score of 88.0 (5.9).

Step count scores for **sedentary and active adults aged 18-44** are in Table 5.[6]

- Sedentary adults aged 18-24 had a normative score of 101.2 (10.7) steps and active adults aged 18-24 had a normative score of 117.2 (25.6) steps.

The number of steps performed by individuals with **mild cognitive impairments and Alzheimer's** dementia are recorded in Table 6.

- Individuals with mild cognitive impairments had a normative score of 75.7 (21.0) steps and individuals with mild Alzheimer's dementia had a normative score of 63.8 (27.2) steps.

The average number of steps for **older adults at risk for falling** are 82.70 ±16.50 steps, the average for those not at risk are 92.33 ±11.93.[7]

- A score of 50 steps or less is associated with an odds ratio of 11.59 to scoring less that 8.12 seconds on the Right Leg Stance Eyes Open (RLSEO) component of the Berg Balance Test (BBT); furthermore, the RLSEO was the greatest predictor of overall score of the BBT with a Spearman Rank Coefficient (rs)=0.83 (excellent correlation), p<0.001 level of significance.[8]
- In the population **at risk for sarcopenia**, males (average age 83.4 ±4.5 years) produced normative step counts of 82.7 ± 23, females (average age of 82.4 ± 4.4) produced normative step counts of 80.2 ± 22.5 steps.[9]
- Norms for individuals with **physical frailty** are as follows: non-frail: 50 steps, pre-frail: 40 steps, frail: 27.5 steps.[10] Cutoff point for physical frailty (excluding pre-frail) is 42 steps, sensitivity = 93-96%, specificity = 74-77%, AUC = 0.89, p = 0.001.[11]

Cutoff scores for **predicting physical independence** in the geriatric population can be found in Table 7.4

- Cutoff point for normal functional capacity in elderly who are hypertensive was 69 steps (sensitivity of 80% and specificity of 46%).[12]

Table 3: Normative Step Counts for "Moderate Functioning" Geriatric Population[4]
(Step counts for older adults defined as "moderate functioning" via the Composite Physical Function Scale. n=2,140)

Age (Years)	Participants (n)	Males: Step Count (SD)	Females: Step Count (SD)
60-64	144	92.6 (20.8)	85.9 (24.5)
65-69	369	89.3 (25.1)	85.1 (24.2)
70-74	538	92.5 (20.6)	83.5 (21.9)
75-79	515	90.1 (27.1)	83.1 (23.0)
80-84	306	81.2 (27.1)	78.5 (19.7)
85-89	180	75.5 (28.5)	74.2 (18.4)

Table 4: Normative Step Counts for the Population with Heart Failure[5]
(n=168; Mean age: 59 (12); New York Heart Association Classification: Class 1 n=28, Class 2 n=85, Class 3 n=49, Class 4 n=6; Left Ventricle Ejection Fraction: 32% (8%), Polish sample))

New York Heart Association Classification Scale	Step Count (SD)
NYHA Class 1-2 n=113	92.3 (21.2)
NYHA Class 3-4 n=55	79.4 (19.7)
NYHA Class 1-4 n=168	88.0 (5.9)

Table 5: Normative Step Counts for Non-Elderly Adult Population[6]
(n=200; Age Range 18-44, Brazilian sample).

Activity Level		Average Age: Years (SD)	Step Count (SD)
Sedentary (age 18-24)	50	21.7 (1.5)	101.2 (10.7)
Active (age 18-24)	50	21.9 (1.5)	117.2 (25.6)
Sedentary (age 25-44)	50	29.4 (5.2)	95.0 (20.5)
Active (age 25-44)	50	30.8 (5.7)	103.1 (22.3)

Table 6: Normative Step Counts for the Population with Mild Cognitive Impairment and Alzheimer's Dementia[13]
(n=93; Age 74-79, Healthly to Moderate AD, Brazilian sample).

Population	Age: Years (SD	Step Count (SD)
Healthy Adults n=36	74.0 (9.2)	87.6 (20.8)
Mild Cognitive Impairment n=18	79.0 (5.5)	75.7 (21.0)
Mild Alzheimer's Dementia n=25	78.5 (7.4)	63.8 (27.2)
Moderate Alzheimer's Dementia n=14	78.9 (8.3)	54.6 (26.5)

Table 7: Normative Step Counts for Predicting Physical Independence in the Geriatric Population[4]
(n=2,140; age Range 60-94)
Cut-off Scores for predicting physical independence.

Age	Number of Steps (Male)	Number of Steps (Female)
60-64	106	97
65-69	101	93
70-74	95	89
75-79	88	84
80-84	80	78
85-89	71	70
90-94	60	60

Table 8: Concurrent, Convergent, and Predictive Validity

Population	Concurrent/Convergent Validity	Predictive Validity
Geriatrics	R=.73 (Pearson's r correlation between 2mst and 1 mile walk time)[1] R=.74 (Pearson's r correlation between 2mst and time on treadmill to 85% heart rate)[1] Pearson's r correlation between the 2MST and the TUG: R = 0.66, p < 0.004[14] Pearson's r correlation between the 2MST and the 6MWT: R = 0.36, p < 0.004[14]	R=.18 (Spearman correlation between the 2MST and Beck Depression Inventory-2)[16]
Alzheimer's Dementia		R2=0.35, p<0.001 Spearman correlation between the 2MST and Global Cognition[13]
Stroke		R=0.51, p<0.001 (Spearman correlation between 2MST and gait velocity.[17] For every increase in step number, gait velocity improved by 0.37 m/sec.[17]
Fallers and Non-Fallers	Significant positive correlation between the 2MST and the Tinetti POMA: R = 0.4875 (Adequate), p < 0.0250[15]	R=0.56, p<0.001 (Spearman correlation between 2MST and the Berg Balance Test)[8]
Sarcopenia		OR = 0.98, CI = 0.97-0.99, p < 0.001 (relationship between 2MST and predicting the use of home care services in a population with Sarcopenia)[9]
Heart Failure	R=0.44, p<0.0001 (Correlation between 2mst and 6 minute walk test, level of significance) R=0.34, p<0.001 (correlation between the 2mst and the Modified Bruce Protocol, level significance) R=0.61, p<0.001 (Correlation between the 2mst and quadriceps strength, level of significance)[5]	

- Test-retest reliability for the geriatric population is excellent with an Interclass Correlation of 0.90.[4]

Predictive, Concurrent, and Convergent Validity data can be found in Table 8.

Discussion

This review of the psychometric data for the 2 Minute Step Test furthers the work of Bohannon and Crouch by providing data from populations with specific health conditions that separate them from the community-dwelling older adult population. Their systematic review of 2MST included information in 30 articles from populations of geriatrics, heart failure and hypertension, sedentary and obese individuals, community and facility dwelling individuals, Parkinson's Disease, stroke, and depression.[2] This work expands on the psychometric data provided in these same populations and offers additional populations of cardiovascular diseases, adults, Alzheimer's dementia, cognitively impaired older adults, individuals at risk for sarcopenia, physical frailty, and those who are at risk for falling.

Conclusion

The 2 Minute Step Test is a widely used performance-based outcome measure for assessing functional fitness and aerobic capacity in older adults. In 1999, Rikli and Jones included the 2MST as a component of the Senior Fitness Test which was validated in a geriatric population sample aged 60-94 years old.[1] Their study had over 7,000 participants and produced strong psychometric data. As the popularity of the 2MST has grown, there have been limited studies utilizing high quality validation for populations other than geriatrics. The goal of this review is to provide readers a document that demonstrates the expanded validity of the 2 Minute Step Test in various populations.

References

1. Rikli RE, Jones CJ. Functional fitness normative scores for community-residing older adults, Ages 60-94. Journal of Aging & Physical Activity. 1999;7(2):162. Accessed June 22, 2021.
2. Bohannon RW, Crouch RH. Two-Minute Step Test of Exercise Capacity: Systematic Review of procedures, performance, and clinimetric properties. J Geriatr Phys Ther. 2019;42(2):105-112. doi:10.1519/JPT.0000000000000164
3. Rikli RE, Jones CJ. Measuring functional fitness of older adults. The Journal on Active Aging. 2002, 24-30.
4. Rikli RE, Jones CJ. Development and validation of criterion-referenced clinically relevant fitness standards for maintaining physical independence in later years. Gerontologist. 2013;53(2):255-267. doi:10.1093/geront/gns071
5. Węgrzynowska-Teodorczyk K, Mozdzanowska D, Josiak K, et al. Could the two-minute step test be an alternative to the six-minute walk test for patients with systolic heart failure? Eur J Prev Cardiol. 2016;23(12):1307-1313. doi:10.1177/2047487315625235
6. Nogueira MA, Almeida TDN, Andrade GS, et al. Reliability and Accuracy of 2-Minute Step Test in Active and Sedentary Lean Adults. J Manipulative Physiol Ther. 2021;44(2):120-127. doi:10.1016/j.jmpt.2020.07.013
7. Zhao Y, Chung P-K. Differences in functional fitness among older adults with and without risk of falling. Asian Nurs Res. 2016;10(1):51-55. doi:10.1016/j.anr.2015.10.007
8. Toraman A, Yıldırım NÜ. The falling risk and physical fitness in older people. Arch Gerontol Geriatr. 2010;51(2):222-226. doi:10.1016/j.archger.2009.10.012
9. Björkman M, Jyväkorpi SK, Strandberg TE, Pitkälä KH, Tilvis RS. Sarcopenia Indicators as Predictors of Functional Decline and Need

for Care among Older People. J Nutr Health Aging. 2019;23(10):916-922. doi:10.1007/s12603-019-1280-0
10. Yang M, Guo Y, Gong J, Deng M, Yang N, Yan Y. Relationships between functional fitness and cognitive impairment in Chinese community-dwelling older adults: a cross-sectional study. BMJ Open. 2018;8(5). doi:10.1136/bmjopen-2017-020695
11. Furtado GE, Patrício M, Loureiro M, et al. Physical frailty and health outcomes of fitness, hormones, psychological and disability in institutionalized older women: an exploratory association study. Women Health. 2019;60(2):140-155. doi:10.1080/03630242.2019.1621978
12. Guedes MB, Lopes JM, Andrade Ade, Guedes TS, Ribeiro JM, Cortez LC. Validation of the two minute step test for diagnosis of the functional capacity of hypertensive elderly persons. Revista Brasileira de Geriatria e Gerontologia. 2015;18(4):921-926. doi:10.1590/1809-9823.2015.14163
13. Plácido J, Ferreira JV, de Oliveira F, et al. Association among 2-min step test, functional level and diagnosis of dementia. Dement Neuropsychol. 2019;13(1):97-103. doi:10.1590/1980-57642018dn13-010011
14. Pedrosa R, Holanda G. Correlação entre os testes da caminhada, marcha estacionária e TUG em hipertensas idosas. Braz J Phys Ther. 2009;13(3):252-256. doi:10.1590/s1413-35552009005000030
15. Zak M, Biskup M, Macek P, Krol H, Krupnik S, Opuchlik A. Identifying predictive motor factors for falls in post-menopausal breast cancer survivors. PLOS ONE. 2017;12(3). doi:10.1371/journal.pone.0173970
16. de Oliveira Brito LV, Maranhao Neto GA, Moraes H, Emerick RF, Deslandes AC. Relationship between level of independence in activities of daily living and estimated cardiovascular capacity in elderly women. Arch Gerontol Geriatr. 2014;59(2):367-371. doi:10.1016/j.archger.2014.05.010
17. Taylor-Piliae RE, Latt LD, Hepworth JT, Coull BM. Predictors of gait velocity among community-dwelling stroke survivors. Gait Posture. 2012;35(3):395-399. doi:10.1016/j.gaitpost.2011.10.358

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The clinimetric breakdown of the 2MST can be found online in the APTA Resources. [Download it here.]

Stop the Stoop

Can PT Make a Difference in Age-Related Hyperkyphosis? A Case Report Using Manual Therapy and Exercise

by Lynne C Hughes, PT, PhD; Rebecca V Galloway, PT, PhD; and Adrianna Ellis, PT, DPT

Editor's Note: This clinical case commentary is part of content for the January 2022 Journal Club discussion on Katzman WB, Parimi N, Gladin A, Wong S, Lane NE. Long-Term Efficacy of Treatment Effects after a Kyphosis Exercise and Posture Training Intervention in Older Community-Dwelling Adults: A Cohort Study. J Geriatr Phys Ther. 2021;44(3):127-138. doi:10.1519/JPT.0000000000000262

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. Register to join us or view archived recordings at geriatricspt.org/journal-geriatric-physical-therapy.

Art, an 88-year-old male, is referred by his geriatrician to physical therapy (PT) on the request of his daughters. They report a decline in his posture and balance over the last 6 months. Specifically, they noticed that his forward trunk lean was worse; he seems to lose his balance when turning.

PMH

- Type 2 diabetes mellitus for over 20 years (estimated by patient report), controlled with Metformin, diet, and exercise. His most recent A1c was recorded 2 months prior to PT at a 6.9.
- Osteopenia, diagnosed 3 years ago, believed to be due to primary hyperparathyroidism. Bone Mineral Density (DXA) scan T-Scores for lumbar spine were -0.7, right femoral neck -2.2, and right total hip -1.7. Parathyroid glands were removed 3 years ago. No follow-up bone scan available.
- Motor vehicle accident 6 years ago with bilateral rib fractures, left clavicular fracture, left radial head dislocation (s/p reduction), pelvic fractures, left hip fractures (s/p ORIF), left femoral shaft fracture (s/p rodding), and a torn left PCL. Art also had a ruptured spleen and underwent splenectomy.

Subjective Interview

Patient initially presented with no complaints, no pain, and no history of falls in the last year. He reported that functionally he is "doing fine". When pressed further he does admit to being "off balance" with initial standing, his cane helps. He reports walking the loop (~.5 mile) in his neighborhood once a day using his cane but that he used to walk it twice a day. His family also reports difficulty with transfers; he requires the use of both arms to stand, squat, and perform tub transfers even when using a tub bench.

Social/environmental history: Art lives with his 3 daughters and son in a 1.5 story house with 1 step to enter. He does not go upstairs. He is a retired teacher, active in his church choir, likes to go on day trips to local area parks, and enjoys reading. He has a social personality and a remarkably good sense of humor.

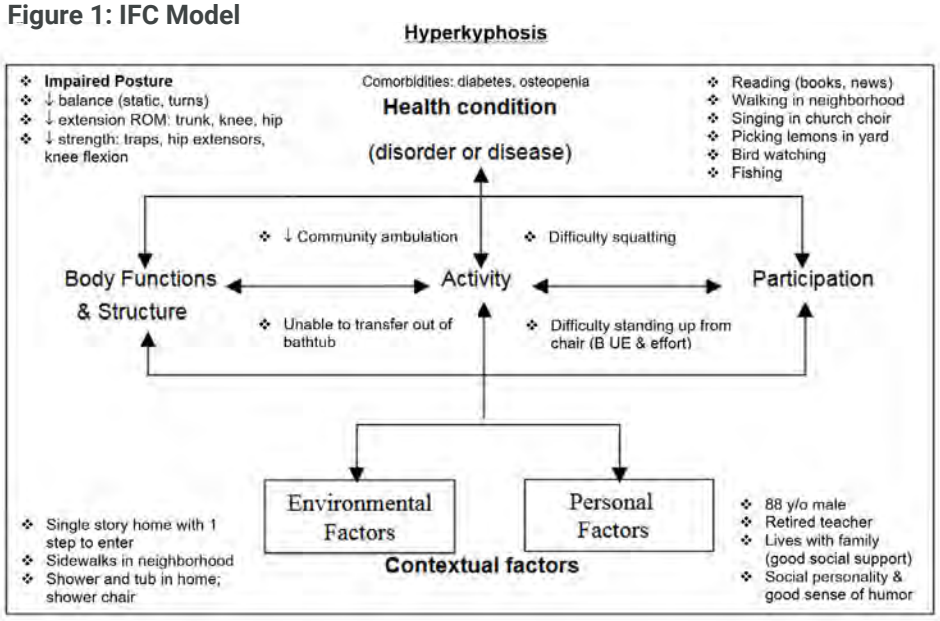
All components of the history and interview were placed in the ICF model for a pictorial view of the patient as a whole person and the areas of his life influenced by hyperkyphosis.[1] See Figure 1.

Initial Measures

Posture: Forward head, rounded shoulders, hyperkyphosis, forward trunk lean, right lateral trunk lean, and increased hip, knee, and dorsi-flexion. Photos were taken with the patient facing forward (frontal view) and a sagittal view.

Height: 166.3 cm using wall stadiometer. Patient was unable to put his heels against the wall. A 2x6 board was placed on the floor against the wall and with patient heels

Figure 1: IFC Model



against the board. This modification allowed the patient to feel balanced as well as providing a consistent measurement method. See an instructional video on height measurement modification.

Flexicurve: usual posture measured in standing. Flexible ruler tracing used to calculate the Kyphotic index (KI). KI = Thoracic Width (W)/ Thoracic Length (TL)*100. KI = 12.16.[2]

Block Test: measured in supine by stacking blocks under the head until the plane of the face is parallel with the table. This test was modified by using blocks of different thicknesses to achieve the most level facial plane. Block measured 7.7 cm. See an instructional video of modification to block test.

Functional Reach: Patient performed a practice trial and then 2 trials that were averaged for a result of 6.6 in.

TUG test: Patient performed a practice trial and then 3 trials that were averaged for a result of 13.3 seconds. He was allowed to use his cane.

PROM: All measures taken in supine. Shoulder flexion 170°, Hip extension lacking 6° from neutral, Knee extension lacking 5° from neutral, Popliteal angle (hamstring length) 115°.

Strength: Shoulder flexion 5/5, Prone scapular horizontal adduction 4-/5, Prone hip extension 4-/5, Knee extension 4+/5, Knee flexion 4-/5, Standing calf raises (bilateral) 25/25 reps.

Joint and soft tissue mobility: Cervical (upglide, downglide, and lateral glide), thoracic (PA springing), and lumbar spine (PA springing) were hypomobile. The rib cage (general springing) including the first rib (inferior glide), and the general mobility of the hip and knee were all hypomobile. The following muscle groups were found to be tight and short: suboccipital, sternocleidomastoid (SCM), scalene, pectoralis minor, iliopsoas, and hamstrings.

Sensation: Using a Semmes – Weinstein 5.07 (10 gram) monofilament on the standard locations for diabetic neuropathy on the plantar surface of the foot, the patient detected 2 of 9 trials correctly.

Gait: Gait parameters were collected using a 14-foot Gaitrite™ walkway. Patient was instructed to walk at his usual pace and was allowed to use his cane. Patient was given one practice trial; then 3 trials were averaged. Left and right measures of step length (SL) and heel to heel base of support (H-H BOS) were averaged. Velocity (V) was also recorded. The results were SL = 38.65 cm, H-H BOS = 18.73 cm, and V = 0.8 m/s.

Assessment

Art is an active older adult with flexed posture and lateral trunk lean. He was unable to achieve upright standing against the wall due to a feeling of falling forward when he attempted to back his heels against the wall. When a 2x6 board was placed between the wall and his heels, he reported feeling balanced over his feet to allow for height measurement. Patient's usual functional level was ambulation community distances with a cane. Functional reach of 6.6 inches placed him at a moderate risk for falls and was below the norm of 13.2 inches for men aged 70-87.[3,4] TUG score was just under the 13.5 second cut-off score for risk of falls.[5] However, he was slower than the mean TUG score of 9-11 seconds for his age and sex which may have indicated decline beyond age-related change.[6] Patient had slightly limited hip and knee extension with severely limited hamstring length. Additional impairments relevant to posture and function included weakness in middle trapezius, gluteal, and hamstrings. KI (12.16) was slightly above the median of 11 for men 80 years or older that may indicate greater kyphosis than typical for his age.[7] A block score of 7.7 cm (greater than 1.7 cm) indicated a forward head position that may also be associated with thoracic hyperkyphosis.[8,9] Art exhibited many of the signs of upper and lower crossed syndrome with a forward head, tight muscles: suboccipital, scalene, pectoralis, iliopsoas, hamstrings and inhibited muscles: mid trap, gluteal, quads and general stiffness of the joints.[10] Patient had impaired protective sensation in both feet secondary to diabetic neuropathy that may impact his balance and gait.[11] Gait parameters showed a wide BOS and velocity of an intermediate gait speed.[12]

Treatment and Intervention

Art received treatment 3x/week for 4 weeks from a PT with manual therapy certification. Each treatment session was 30 minutes to an hour in duration. He received a combination of joint mobilizations, myofascial release, passive stretching, and exercise that targeted his areas of joint stiffness, muscle tightness, and muscle weakness. Patient received the following joint mobilizations at a grade III or IV to improve mobility: PA rib mobilization, first rib depression, clavicular mobs – inferior and superior glides, scapular glides, posterior glenohumeral glides, cervical downglides and distraction, thoracic PA and screw home mobilizations, hip mobilizations – anterior, lateral, and long axis distraction. Soft tissue mobilization (STM), proprioceptive neuromuscular facilitation (PNF), and/or passive stretching (PS) were applied to the suboccipitals (STM), SCM (STM), scalenes (STM), erector spinae (STM and PS), upper traps (PNF and PS), pec minor (STM and PNF), hip flexors (PNF), hip adductors (PS), and hamstrings (PNF). Active and elastic band resisted exercise were performed by the patient for 1-2 sets of 10 reps to activate the muscles through their new available range of motion. Physical and verbal cueing for proper movement, muscle activation, and stabilization were provided as needed. Exercises included scapular retraction with core activation, scapular rows, bear hugs for lower traps, punches with a plus, posterior pelvic tilts, single knee to chest, and clam shells with transverse abdominis activation. A selection of these treatments was adapted each visit according to the restrictions identified on that visit. The same sequence of mobilize the joints, then lengthen the soft tissue, and lastly exercise in the new range was followed on each visit: Move it, then use it.

Final Measures at 4 weeks

Posture: A/P view with minimal right lateral trunk shift. Sagittal view with a neutral pelvis and minimal forward head posture. See pre- and post-intervention photos in Figure 2.

Height: 168.4 cm (with 2x6 board between heels and wall)

Flexicurve: KI = 10.99

Block Test: 4.5 cm.

Functional Reach: 2 trials averaged = 8.9 in.

TUG test: Avg of 3 trials = 9.5 secs

PROM: Shoulder flexion 157°, Hip extension 5° (side lying), Knee extension 0°, Popliteal angle (hamstring length) 155°.

Strength: Shoulder flexion 5/5, Prone horizontal adduction 4/5, Prone hip extension 4-/5, Knee extension 5/5, Knee flexion 5/5, Standing calf raises (bilateral) 25/25 reps.

Joint and soft tissue mobility: Spinal and rib cage mobility remained hypomobile with the greatest change occurring in the rib cage. Soft tissue mobility improved most notably in the suboccipitals, pectoralis minor, scalenes, and hamstrings.

Sensation: not re-assessed.

Gait: SL increased to 54.87 cm, H-H BOS narrowed to 11.42, and velocity increased to 0.93 m/s.

Figure 2. Photographs Showing Pre- to Post-Intervention Change in Usual Posture

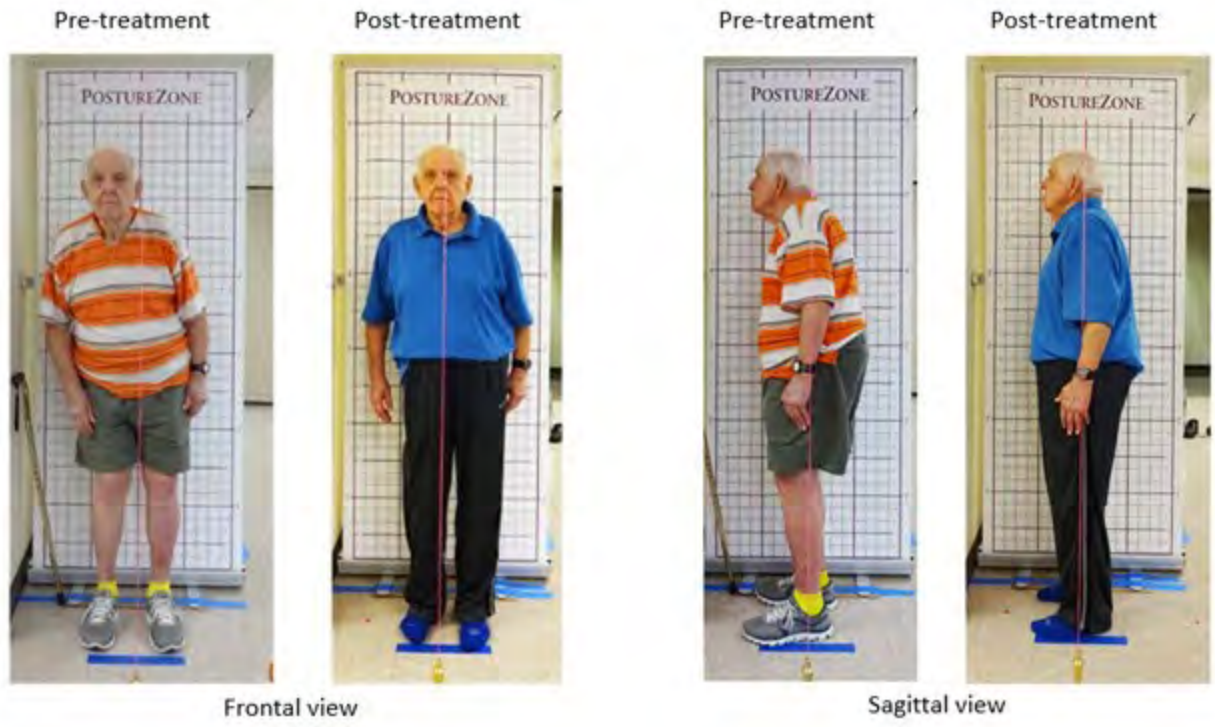


Table 1. Changes in Outcome Measures Pre- to Post-Intervention

	Pre-intervention	Post-intervention	Change
Height (cm)	166.3	168.4	+2.1
KI	12.16	10.99	-1.17*
Block (cm)	7.7	4.5	-3.2
Functional Reach (in)	6.6	8.9	+2.3
TUG (secs)	13.3	9.5	-3.8*
ROM Shoulder Flex (º)	170	157	-13
ROM Hip Ext (º)	Lacking 6 from neutral	5	+11
ROM Knee Ext (º)	5	0	+5
ROM Popliteal angle (º)	115	155	+40
MMT Shoulder Flex	5/5	5/5	0
MMT Scapular Prone Horizontal Adduction	4-/5	4/5	+.5
MMT Hip Extension	4-/5	4-/5	0
MMT Knee Extension	4+/5	5/5	+.5
MMT Knee Flexion	4-/5	5/5	+.1.5
SL (cm)	38.65	54.87	+16.22*
H-H BOS (cm)	18.73	11.42	-7.43*
V (m/s)	.80	.93	+.13*

**change greater than MDC*

Summary/Discussion

This patient case illustrates that PT can make an improvement in impairments and function associated with age-related hyperkyphosis using manual therapy and exercise in a 4-week time frame. Observation of postural pictures demonstrates a dramatic change in this patient's forward head and lateral trunk lean. The lateral lean was not addressed during treatment other than ensuring that the patient lie in a straight position. Improvements occurred in most measures; reflected in the change scores in Table 1.

Height increased by nearly an inch which indicates an improvement in posture that is both observed and is evident in the improved KI and Block test that reflect change in thoracic kyphosis and forward head position. The flattening of the thoracic kyphosis as seen in the decrease in KI of 1.17 or 9.6% change is greater than the .73% MDC.[13] The improvement in Functional Reach and TUG may indicate better balance and a decrease in fall risk for Art. Shoulder flexion ROM showed a decrease of 13°. There is not an obvious reason for the range to lessen. However, the treatment may have changed the position of the scapula on the trunk and rib cage and indirectly affected the ROM. Hip extension increased by 11° and may have allowed a more neutral pelvic position seen on photos. The hamstring length showed a big gain of 40°. Improved hip extension and hamstring length may be hypothesized to influence step length and gait speed and indeed, a clinically significant increase was seen in these parameters. TUG speed also improved by 3.8 secs which is greater than the MDC of 2.08 sec for community-dwelling older adults.[14] The hamstring strength also demonstrated a notable increase that would not be expected in only 4 weeks. The gain in MMT may be due to better muscle activation, with increased range, and better positioning. Gait parameters all improved more than the MDC. SL increased by 16.22 cm (MDC of 4.7 cm), H-H BOS decreased by 7.43 cm (MDC = 2.0 cm), and V increased by .13 m/s (MDC is 0.1 m/s).[15,16] Overall, Art showed improvement in alignment, function, gait, lower extremity strength (muscle activation) and range of motion.

There is a body of evidence that hyperkyphosis has a multidimensional impact seen through examining a diversity of outcome measures including spinal alignment, trunk strength, endurance, physical activity, function, mental health, quality of life, and mortality.[9,17–22] Subtle postural changes over time may be a barrier to older adults recognizing that hyperkyphosis affects their daily function and participation in activities. Patients typically seek PT treatment when pain becomes an issue rather than seeking help to prevent or improve posture.

Katzman et al has established that exercise and postural training are effective in reversing hyperkyphosis with long term (3-year) effects after a 12-week intervention; thus, building evidence that PT can reverse and maintain a difference in hyperkyphosis.[23] This evidence shows that PT should be treating patients with hyperkyphosis and perhaps even older individuals that are beginning to demonstrate postural changes to prevent the usual progression of kyphosis expected with ageing. In doing so, we may be able to prevent or slow the associated decline in physical function, health, and self-image. PT has an opportunity to make a significant impact on maintaining posture, physical function, and independence in an ageing population. Our profession should seek to promote physical therapy as a positive alternative to the bias of poor posture being a normal consequence of ageing.

Art's case illustrates the multifaceted relationship of age-related hyperkyphosis on alignment, joint and soft tissue mobility, function, and balance. The ICF model applied to this patient's interview clearly illustrates the influence of hyperkyphosis on different aspects of life that posture may influence. This patient case illustrates a novel approach of combining manual therapy with exercise for a short, 4-week clinically feasible timeframe.

There is a continued need for further randomized control trials to standardize effective treatments for hyperkyphosis and substantiate the impact that PT can make on alignment, function, gait, activities, and participation in life roles associated with posture that can be seen both in the short and long term.

References

1. World Health Organization. Towards a Common Language for Functioning, Disability and Health: ICF. Published 2002. Accessed September 18, 2020. http://www.who.int/classifications/icf/icfbeginnersguide.pdf?ua=1
2. Lindsey C. Geriatric Assessment Tool Kit. Flexicurve Spinal Measurement. https://geriatrictoolkit.missouri.edu/Flexicurve-spinal-measurement.doc
3. Duncan PW, Studenski S, Chandler J, Prescott B. Functional reach: Predictive validity in a sample of elderly male veterans. *Journals Gerontol*. 1992;47(3):93-98. doi:10.1093/geronj/47.3.M93
4. Duncan PW, Weiner DK, Chandler J, Studenski S. Functional Reach: A New Clinical Measure of Balance. *J Gerontol*. 1990;45(6):M192-197.
5. Shumway-Cook A, Brauer S, Woollacott M. Predicting the probability for falls in community-dwelling older adults using the timed up and go test. Phys Ther. 2000;80(9):896-903. doi:10.1093/ptj/80.9.896
6. Steffen TM, Hacker TA, Mollinger L. Age- and Gender-Related Test Performance in Community-Dwelling Elderly People: Six-Minute Walk Test, Berg Balance Scale, Timed Up and Go Test, and Gait Speeds. *Phys Ther.* 2002;82(2):128-137.
7. Nishiwaki Y, Kikuchi Y, Araya K, et al. Association of thoracic kyphosis with subjective poor health, functional activity and blood pressure in the community-dwelling elderly. *Environ Health Prev Med.* 2007;12(6):246-250. doi:10.1007/bf02898031
8. Leidig-Bruckner G, Minne HW, Schlaich C, et al. Clinical grading of spinal osteoporosis: Quality of life components and spinal deformity in women with chronic low back pain and women with vertebral osteoporosis. *J Bone Miner Res.* 1997;12(4):663-675. doi:10.1359/jbmr.1997.12.4.663
9. Kado DM, Huang MH, Karlamangla AS, Barrett-Connor E, Greendale GA. Hyperkyphotic posture predicts mortality in older community-dwelling men and women: A prospective study. J Am Geriatr Soc. 2004;52(10):1662-1667. doi:10.1111/j.1532-5415.2004.52458.x
10. Magee DJ, Manske RC. *ORTHOPEDIC PHYSICAL ASSESSMENT*. 7th ed. Saunders Elsevier; 2021.
11. Ko M, Hughes L, Lewis H. Walking speed and peak plantar pressure distribution during barefoot walking in persons with diabetes. *Physiother Res Int.* 2012;17(1):29-35. doi:10.1002/pri.509
12. Studenski S, Perera S, Wallace D, et al. Physical performance measures in the clinical setting. *J Am Geriatr Soc.* 2003;51(3):314-322. doi:10.1046/j.1532-5415.2003.51104.x
13. Yanagawa TL, Maitland ME, Burgess K, Young L, Hanley D. Assessment of thoracic kyphosis using the flexicurve for individuals with osteoporosis. *Hong Kong Physiother J.* 2000;18(2):53-57. doi:10.1016/S1013-7025(00)18004-2
14. Donoghue OA, Savva GM, Börsch-Supan A, Kenny RA. Reliability, measurement error and minimum detectable change in mobility measures: A cohort study of community-dwelling adults aged 50 years and over in Ireland. *BMJ Open.* 2019;9(11). doi:10.1136/bmjopen-2019-030475
15. Almarwani M, Perera S, Vanswearingen JM, et al. The test–retest reliability and minimal detectable change of spatial and temporal gait variability during usual over-ground walking for younger and older adults. *Gait Posture.* 2016;44(February 2016):94-99. doi:doi:10.1016/j.gaitpost.2015.11.014
16. Ries JD. Age-Related Changes in Gait and Mobility. In: Avers D, Wong RA, eds. Guccione's Geriatric Physical Therapy. 4th ed. Elsevier; 2020:201-219. doi:10.1016/B978-0-323-60912-8.00009-9
17. Jang H-J, Hughes LC, Oh D-W, Kim S-Y. Effects of corrective exercise for thoracic hyperkyphosis on posture, balance, and well-being in older women. *J Geriatr Phys Ther.* 2019;42(3):E17-E27. doi:10.1519/jpt.0000000000000146
18. Roghani T, Zavieh MK, Manshadi FD, King N, Katzman W. Age-related hyperkyphosis: update of its potential causes and clinical impacts—narrative review. *Aging Clin Exp Res.* 2017;29(4):567-577. doi:10.1007/s40520-016-0617-3
19. Katzman WB, Vittinghoff E, Lin F, et al. Targeted spine strengthening exercise and posture training program to reduce hyperkyphosis in older adults: results from the study of hyperkyphosis, exercise, and function (SHEAF) randomized controlled trial. *Osteoporos Int.* 2017;28(10):2831-2841. doi:10.1007/s00198-017-4109-x
20. Katzman WB, Parimi N, Gladin A, et al. Reliability of sagittal vertical axis measurement and association with measures of age-related hyperkyphosis. *J Phys Ther Sci.* 2018;30(12):1417-1423. doi:10.1589/jpts.30.1417
21. Katzman WB, Harrison SL, Fink HA, et al. Physical function in older men with hyperkyphosis. *Journals Gerontol - Ser A Biol Sci Med Sci.* 2015;70(5):635-640. doi:10.1093/gerona/glu213
22. Katzman WB, Sellmeyer DE, Stewart AL, Wanek L, Hamel KA. Changes in flexed posture, musculoskeletal impairments, and physical performance after group exercise in community-dwelling older women. *Arch Phys Med Rehabil.* 2007;88(2):192-199. doi:10.1016/j.apmr.2006.10.033
23. Katzman WB, Parimi N, Gladin A, Wong S, Lane NE. Long-term efficacy of treatment effects after kyphosis exercise and posture training intervention in older community-dwelling adults: A cohort study. *J Geriatr Phys Ther.* 2021;44(3):127-138. doi:10.1519/JPT.0000000000000262

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Gait Interventions: Has Everything Old Become New Again?

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

In the past 20 years, there have been dramatic, research-driven changes in how we address posture and strength, but much of our approach to gait issues has been more of a fine-tuning than a major overhaul.

In the past decade, several meta-analysis and systematic reviews have been published with numerous effective interventions for gait issues commonly seen by older adults in the community and even those with dementia.[1-3] Yet, many of the interventions suggested look a lot like those of decades past, with some refinement. This article will share some of the classic tried-and-tested gait interventions, as well as some of the newer modifications. We will also share research on promising novel interventions to address gait impairment in older adults.

In 2001, Hauer's exercise protocol demonstrated improvement in gait parameters among older participants.[4] His well-designed program incorporated progressive resistive exercises (PRE) and progressive functional training 3 times per week for 3 months. The program had a 10-minute warm-up followed by PRE 3 times weekly to the lower extremity (hip abduction and extension, as well as knee extension and plantarflexion trained at 80% of a 1 repetition maximum [1RM].) The functional exercises included forward and backward stepping, ball throws, sit to stands, and one- leg standing activities.

In Hauer's newer study[5] the intervention protocol has been tweaked a bit:

• Postural balance tasks included standing in progressively challenging positions (side-by-side stance, semi-tandem stance, tandem stance).

• Strength exercises targeting basic ADL-related activities, including functional strength (such as heel raises, chair rises, and stair rises).

Participants were instructed to perform 2 series of 7–10 repetitions for each exercise. Balance positions were maintained for 30 seconds. Progression of training was facilitated by increasing task difficulty (e.g., narrowing standing positions, reduction of postural stabilization by reducing handgrip) and by increasing the workload (number of repetitions in strength-related tasks, single vs. double stand, reducing arm support). Training intensity was adjusted to individual's performance level; participants were instructed to stop exercising or reduce difficulty when feeling exhausted or overtaxed.

Dr Jessie VanSwearingen's early work was very creative. She took a motor learning approach and developed a program that was particularly effective for older adults with slow and variable gait.[6] Her team's timing and coordination intervention was superior to the control intervention of impairment-focused walking, balance, endurance, and PRE. This original timing and coordination program was implemented twice weekly for 12 weeks and included the following motor tasks: stepping patterns with weight shifting, walking in ovals, spiral and serpentine patterns, crossing paths of others, and treadmill paced walking, including speed drills. The program was progressed to include alternating forward, backwards and diagonal stepping patterns, as well as increasing task complexity, such as bouncing a ball and carrying objects while walking. The program included 5 minutes for warm-up and cool-down flexibility exercises.[6,7]

Research has continued over the last decade on this motor learning task-based approach to gait intervention. A similar motor-control-based protocol improved gait variability and smoothness more than a conventional approach in a population of older adults with mild gait limitations.[8] "On The Move," (OTM) a group exercise intervention, was developed based on the Timing and Coordination program.[9] The OTM had the additions of strengthening (heel raises and repeated chair rises), group interaction, and education to the stepping exercises and gait activities in the original intervention. The group size was 10 participants, with a physical therapist and one assistant conducting the sessions, twice weekly for 24 weeks. Compared to a seated strength, endurance, and flexibility group exercise program, OTM demonstrated greater gains in gait speed and the 6-minute walk test.[9] Initial analysis of OTM suggests that participation in OTM may reduce risk of hospitalization for 12 months following the study compared to those who participated in seated exercise.[10] This novel approach to mitigating gait impairment shows promise as an effective intervention for older adults in therapy practice.

The last set of research-based interventions we'd like to discuss are aerobic and resistance training. A classic, easy to implement program was described by Schiller in 2001. The program increased lower extremity strength and improved gait velocity by exercising once a week for 12 weeks.[11] This simple but effective program used resistive bands to the lower extremity (8 repetitions, 3 sets) and increasing resistance when full range of motion and no tiredness or slight tiredness was noted.

In 2014, Morishma found that a program of interval training could improve aerobic and gait safety and speed.[12] The program consisted of 3–5-minute bouts of 85-90% VO2 interspersed with 2-3 minutes of rest for

20-30 minutes on treadmills, bikes, or rowing machines. In the last example Wang in 2015 combined aerobic, balance, and strengthening exercises.[13] The program was conducted for 1 hour, 3 times weekly for 12 weeks and resulted in improved gait, endurance, performance, and variability. The Wang program consisted of 20 minutes of PRE and 20 minutes of endurance training at 70-80% of maximum heart rate and 1RM. It also included a 20-minute balance component: static (base of support, reach, surfaces) and dynamic (side, back forward, and figure-8 walking).

Good, research-tested gait interventions of decades past have held up very well. Minor tweaks have produced slight improvements making them even better. Innovative interventions have been added to our body of knowledge and continue to be researched to expand their application. Just like our patients, our work needs a few adjustments over time to keep us performing at our best.

References

1. Zhang W, Low L, Gwynn JD , Clemson L. Interventions to improve gait in older adults with cognitive impairment: A systematic review: INTERVENTIONS TO IMPROVE GAIT. JAGS.2019; 67(2): 381-391.
2. Van Abbema R, De Greef M, Craje C, Krijnen W, Hobbelen H, van der Schans C. What type or combination of exercise can improve preferred gait speed in older adults? A meta-analysis. BMC Geriatr.2015; 15(1): 72.
3. Cadore EL, Rodríguez-Mañas L, Sinclair A, Izquierdo M. (2013). Effects of different exercise interventions on risk of falls, gait ability, and balance in physically frail older adults: A systematic review. Rejuvenation Research.2013; 16(2) :105.
4. Hauer K, Rost B, Rütschle K, Opitz H, Specht N, Bärtsch P, Oster P, Schlierf G. (2001). Exercise training for rehabilitation and secondary prevention of falls in geriatric patients with a history of injurious falls. JAGS. 2001; 49(1):10-20.
5. Hauer K, Ullrich P, Dutzi I, Beurskens R, Kern S, Bauer J, Schwenk M. Effects of standardized home training in patients with cognitive impairment following geriatric rehabilitation: A randomized controlled pilot study. Gerontology.2017;63(6):495-506.
6. VanSwearingen JM, Perera S, Brach JS, Cham R, Rosano C, Studenski SA. A randomized trial of two forms of therapeutic activity to improve walking: Effect on the energy cost of walking. J Gerontol A Biol Sci Med Sci. 2009;64(11):1190-8.
7. VanSwearingen JM, Perera S, Brach JS, Wert D, Studenski SA. Impact of exercise to improve gait efficiency on activity and participation in older adults with mobility limitations: A randomized controlled trial. Phys Ther. 2011;91(12:1740-1751.
8. Brach JS, Lowry K, Perera S,Hornyak V, Wert D, et al. Improving Motor Control in Walking: A Randomized Clinical Trial in Older Adults with Subclinical Walking Difficulty. Arch Phys Med Rehabil. 2015; 96(3): 388-394.¬¬¬
9. Brach JS, Perera S, Gilmore S, VanSwearingen JM, Brodfiner D,et al. Effectiveness of a timing and coordination group exercise program to improve mobility in community-dwelling older adults: A randomized clinical trial. JAMA Intern Med. 2017; 177(10): 1437–1444.
10. Coyle PC, Perera S, Albert SM, Freburger JK, VanSwearingen JM, Brach JS. Potential long-term impact of "On the Move" group -exercise program on falls and healthcare utilization in older adults: an exploratory analysis of a randomized controlled trial. BMC Geriatr. 2020;20(1):105
11. Schiller J, Shubert S, Lowe S. The Effects of a 12-week progressive resistive program on lower extremity strength and Timed Up & Go measures in community dwelling elders. Gerinotes. 2001;8(6):12-20.
12. Morishima Y, Mizushima T, Yamauchi K, Morikawa M, Masuki,S, Nose H. Effects of home-based interval walking training on thigh muscle strength and aerobic capacity in female total hip arthroplasty patients: A randomized, controlled pilot study. PLIoS One. 2014; 9(9)e108690-e108690.
13. Wang R, Wang Y, Cheng F, Chao Y, Chen C, Yang, Y. (2015). Effects of combined exercise on gait variability in community-dwelling older adults. Age.2015;, 37(3), 1-8.

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