GeriNotes

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

GeriNotes

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APTA Geriatrics
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Age on.

APTA Geriatrics

An Academy of the American Physical Therapy Association

Mission

Building a community that advances the profession of physical therapy to optimize the experience of aging

Vision

Embracing aging and empowering adults to move, engage, and live well

Values

Person-Centered • Results-Inspired • Change-Drivers • Collaborative-Partnerships

2021-2023 APTA Geriatrics Strategic Framework

Strategic Outcomes

Trusted Resource

The Academy is the premier source for best practices by creating and disseminating tangible resources and supporting knowledge translation that gets the right information to the right people to enhance their professional experience.

Lifelong Learning

The Academy is the leading source for knowledge translation, facilitating the continual training and professional development needed to uphold excellence in the practice of physical therapy for aging adults.

Advocacy

The Academy champions policies that help aging adults by promoting the value of physical therapy while providing comprehensive awareness of geriatric physical therapy as a specialty area of practice.

FY 2021 Strategies and Tactics

Goal/Outcome	FY2021 Strategic Priorities	FY2021 Special Projects/Initiatives
Trusted Resource	Create ways to disseminate clear, relevant information, with modern and high quality design.	• Implement website redesign, with mobile-first approach • Streamline and increase accessibility of Journal Club meetings • Create outreach and communications plan
Lifelong Learning	Identify target audiences and their education needs, to expand our reach with diverse learning formats.	• Deploy survey to understand knowledge gaps and content opportunities • Develop hybridized Certification Courses • Define the value proposition of an Academy-hosted standalone conference
Advocacy	Develop an advocacy agenda, to raise awareness of geriatric physical therapy.	• Identify engagement and partnership opportunities that drive our agenda • Prioritize issues for geriatric PTs/PTAs and students • Research opportunities to develop a student outreach program

From the President

Cathy Ciolek
President,
APTA Geriatrics

It is with great humility that I write this first president's message as president. I want to thank you as an APTA Geriatrics member for your support and confidence in me as a steward for our organization for the next 3 years.

I would be remiss if I did not take a moment to thank Greg Hartley for all he has done as President. His efforts to lead the Board of Directors (BOD) and association have been extraordinary: initiating and completing our rebranding efforts, hiring new association management, adopting best practices in non-profit board leadership, and transitioning our board from one that primarily drives operations to a more strategic and visionary board. And he kept us focused and productive during a pandemic! Greg, on behalf of the entire BOD, thank you! We are better individually and collectively for your efforts.

Now let's look at where we are going! In November/December of 2020, the Board worked with staff to establish a new Strategic Framework. If you saw any of our previous strategic plans, they were detailed action plans assigned to volunteers that required significant board and committee chair facilitation. Our new strategic framework is much more focused with 3 primary strategic outcomes, each of which we'll make progress to achieve over the next 3 years.

Our strategic outcomes include:

- Being a *Trusted Resource* for best practices: creating and disseminating resources and supporting knowledge translation with a focus on getting the right information to the right people at the right time.
- Being the leading source for *Lifelong Learning:* facilitating the training and professional development needed to uphold excellence in clinical practice of PT for aging adults.
- Being champions in *Advocacy*: promoting the value of PT while raising awareness of geriatrics physical therapy as a specialty area.

Each year we will identify three core strategic priorities and supporting special projects and initiatives to help us achieve our strategic outcomes. This work will be done with the content expertise of members and the operational support of our staff. It does not minimize the need for volunteers, but it facilitates the strategic use of our resources and helps us move forward together to support our mission and help us achieve our vision (these did not change).

We will do this work while sustaining our values:

- Being *person-centered* so our work is focused on what is important to both our members and the needs of the community we serve.
- Being *Results-Inspired* so we use key metrics and data to assess our progress as an organization, just like we do for our patient care.
- Being *Change-Drivers* so we take the lead in creating positive change in our industry and practices.
- Having *Collaborative-Partnerships* both inside of APTA and with external groups that share mutual goals.

Take a moment to review the Strategic Framework here and on the previous page and share any questions or comments via geriatrics@geriatricpt.org.

APTA Geriatrics, An Academy of the American Physical Therapy Association

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Questions for APTA Geriatrics leaders and staff can be submitted to geriatrics@geriatricspt.org.

APTA Geriatrics, An Academy of the American Physical Therapy
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From the Editor

Michele Stanley
Editor,
GeriNotes

APTA is 100 years old this year! AgeOn! Although this hasn't been the celebration year of dreams (Hello, pandemic), we are still doing alright. Maybe it wasn't the fireworks of the Magic Kingdom but there was still lots of sparkle going on as APTA Geriatrics shone the spotlight on impressive award winners and leaders. Enjoy the surprised reactions and summary here, and read the summary article on page 6. Seriously, I hope that many of you were able to avail yourselves of the fantastic programming with great handouts, great seating, and up-to-date information. While the congregating, congratulating, and socialization was missed, have you ever been able to see all the program sessions from every Section AND attend all of the SIG events that you wanted to in one CSM before? All while not bartering away your vacation and leave time, or travel budget? Even as we dream of San Antonio, February 2-5, 2022 (mark your calendars and put in your leave requests now), it is ardently hoped that APTA has learned from this and will be able to offer hybrid events in the future to increase time and economic and geographic access to everyone. Programs and platforms need that recorded feature — so much talent, so little time for participants to take it all in during the average CSM.

Remember the "Freshman 15" of college weight woes? The pandemic, isolation, shut-in, and shutouts have all contributed to "pandemic pounds." You may have noticed this in your own patients/practice (not to mention the possibly horrible shrinking of your own jeans). Meet Morgan Nolte PT, DPT who has re-invented her practice to include nutritional counselling and a health and wellness focus. Morgan explains her story in this issue and will be doing some regular columns to inspire us all in coaching for a healthier lifestyle, using video technology, updated business practices, and better PT outcomes. Not to be a "Debbie Downer," this pandemic experience has changed us all in more ways than is measured in BMI, with the expectations of our clients as well. We can adapt, change and give new and expanded reasons for aging adults to Choose PT as they recover.

If you are a mid-career clinician or older, you have, perhaps, wondered what exactly a geriatric residency entails? You may have noticed that in the past year, *GeriNotes* has had a featured column called "Resident's Corner" in most issues. [See the article on Cancer Related Fatigue by Fox Resident Dave Cavignano page 28] The majority of articles submitted this year for the Resident's Corner have been by Fox residents. Did you see the Fox Rehabilitation intro to the APTA Geriatrics Member's meeting? You've certainly had to notice the orange Fox logos all over CSM programming. Who, what, where are they? Spoiler alert: this has nothing to do with the popular "What Does the Fox Say" book, song, and dance. A different Fox resident, in the next issue, will be telling his story of what a residency is and a bit of the history of the organization. Stay tuned.

Balance and Falls is, arguably, the largest and most visible SIG within our Academy. Every older person that we see, irrespective of presenting diagnosis, should be considered for their fall risk. A holistic approach certainly incorporates examining fall risks and looking at prevention strategies. The past year has borne out that staying home has likely saved lives by preventing disease spread, but has NOT decreased falls, despite fewer out-of-home adventures. September and Fall Prevention month is approaching. Given the unknowns of vaccine distribution and availability, planning for in-person fall events is tricky at best. Thinking about a virtual event? The folks at

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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 aging 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 aging adults move, live, and age well.

Celebrating the Profession at the 2021 Awards Ceremony and Member Meeting

The annual Awards Ceremony and Member Meeting looked and felt a little different this year due to the circumstances of the pandemic, but it was no less a celebration of the accomplishments of our members and the profession of physical therapy. While we weren't able to see each other in person, it was still important to recognize our peers and the excellence they bring to our profession.

The following professional, research and student award winners were recognized as part of the virtual broadcast on February 24.

Carole B. Lewis Lecture

Dr. William Staples, PT, DPT, DHSc will present the Carole B. Lewis Lecture at the Combined Sections Meeting in 2022, in San Antonio. We are looking forward to another engaging and inspiring Lewis Lecture by Bill next year.

President's Award

The President's Award recognizes individuals who have provided outstanding service while fostering the mission of the Academy. The President relies on support, advice, dedication and enthusiasm from others committed to advancing the goals of the Academy and this year's winners of the President's award have generously contributed their time and talent in many ways.

The first of two President's Awards was presented to the members of the **APTA Geriatrics Diversity, Equity, and Inclusion Task Force**, co-chaired by doctors Talina Corvus, PT, DPT, PhD and Stephanie Long, PT, DPT. The group's work and findings will inform and guide our association for years to come. This work is among the most important accomplishments achieved by the Academy in 2020. Other members of the task force are Roslyn Burton, PT, DPT; Howard Eisenberg, PT; Adrianna L. Ellis, PT, DPT; Kevin Hazel, SPTA; Rubye Kendrick, PT, MS; and Anandbabu Ramadass, PT, DPT, MPT

The second recipient of the President's Award was **Rolando Lazaro, PT, DPT, PhD**. Rolando dedicated countless hours coordinating webinars offered by APTA Geriatrics. In 2020, this meant a massive shift toward online and virtual education. Rolando's efforts resulted in the largest reach and impact our webinars have ever had in the history of the academy. His organization and ability to move quickly enabled us to be nimble in an evolving environment. His work has set the stage for continued successes with webinars and virtual learning now and in the future.

Joan M. Mills Award

The Joan M. Mills Award is the most significant recognition that the academy gives to one of its members. This prestigious award was initiated in 1980 and named for the academy's founder. The award recognizes a member who has demonstrated, over many years, a high level of competence in meeting the needs of the academy. Joan gave generously, unselfishly, and creatively of her service to the academy. And through her innumerable contributions, she helped shape us into the dynamic organization we are today.

During her six-year tenure as Treasurer of APTA Geriatrics, the recipient of this year's Joan M. Mills Award, **Kate Brewer, PT, MPT, MBA** provided sage advice and practical guidance in decision-making. She also oversaw the financial operations of the organization through substantial challenges, including a pandemic no one could have anticipated. Kate's level-headed stewardship has served our board and your Academy well.

Adopt-a-Doc Award

The Adopt-a-Doc Award recognizes outstanding doctoral students committed to geriatric physical therapy. The purpose is to provide support to doctoral students interested in pursuing faculty positions in physical therapy education and facilitate the completion of the doctoral degree within an area of study relevant to geriatric physical therapy. The two recipients of this year's award were **Jeremy Graber, PT, DPT** and **Valerie Shuman, PT, DPT**.

Jeremy is a doctoral student at the university of Colorado Denver, majoring in rehabilitation science, aging and, specifically, implementation of a clinical decision support tool for rehabilitation recovery after total joint arthroplasty. Valerie is a doctoral student at the university of Pittsburgh. Her major field of study is rehabilitation science, aging, mobility, and implementation of interventions and distal health outcomes in older adults.

Excellence in Geriatric Research Award

The Excellence in Geriatric Research Award recognizes an outstanding research contribution to science as shared in a research report published by a physical therapist member of APTA Geriatrics in a peer-reviewed journal in the field of geriatrics and gerontology. The research is recognized for the perceived impact of the published report on future research, education, clinical practice or a combination of these areas.

We give the Excellence in Geriatric Research Award to **Valerie Shuman, PT, DPT,** for her research, "Association Between Improved Mobility and Distal Health Outcomes," published in the *Journal of Gerontology.*

Fellowship for Geriatric Research Award

The Fellowship for Geriatric Research Award is intended to provide partial financial support to physical therapists pursuing research in geriatrics. The research may be conducted as part of either a formal post-entry level academic program or a mentorship with an established investigator.

Pam Dunlap, PT, DPT, PhD was recognized for her post-doctoral research at University of Pittsburgh with training and collaboration with faculty at Johns Hopkins University. Her research focus was *Use of Global Positioning System (GPS) Measurement to Represent Real-World Community Mobility Outcomes of PT Intervention to Improve Walking Skill In Older Adults and the Relation of the Indicators of Community Mobility to Future Health Outcomes.*

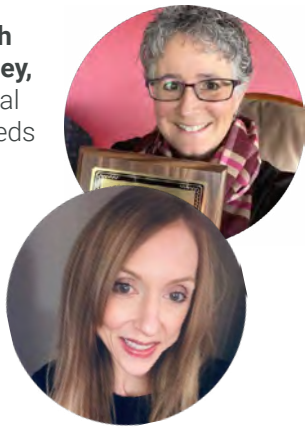
Outstanding PT and PTA Student Awards

The Outstanding PT Student Award identifies a student physical therapist with exceptional scholastic ability and potential for contribution to geriatric physical therapy. This year's award is given to **Krystal Emerson, SPT** from Thomas Jefferson University. As a student, Krystal has dedicated her time through service, leadership and clinical activities. She is the Geriatrics Committee Chair for the Physical Therapy Society at Thomas Jefferson, the secretary for the American Geriatric Society and a class representative. Post-graduation, Krystal hopes to pursue a career that focuses on helping the geriatric population and to become a geriatric certified specialist.

The Outstanding PTA Student Award identifies a student physical therapist assistant with exceptional scholastic ability and potential for contribution to geriatric physical therapy. This year's award is given to **Lindsay Bishop, PTA** from Somerset Community College. Lindsay has excelled academically and pursued many leadership roles including Vice President of her class, vice president of the Physical Therapy Student Organization and as a peer mentor and tutor. She has also been honored at Somerset Community College with both a service-learning award and a leadership award. Lindsay has been highly engaged in the programs' fundraising efforts in the Marquette Challenge. In addition, she is very active with APTA and the Kentucky Chapter. Her application highlighted her commitment and passion for working with the older adult population.

State Advocate of the Year Award

The State Advocate of the Year Award recognizes the work of a current or outgoing State Advocate for APTA Geriatrics who has demonstrated exemplary servitude, advocacy, and effort beyond the basic requirement to continue in the role.



Representing Colorado, **Beth Castellini, PT** and **Tiara Stingley, PT, DPT** have been instrumental in reaching out to meet the needs of their state APTA Geriatrics members during the covid-19 pandemic. They initiated and continue to facilitate monthly meetings on a variety of topics to connect with geriatric PTs and PTAs in Colorado. They plan to continue the monthly zoom meetings and hope to expand attendance in 2021.

Distinguished Educator Award

The Distinguished Educator Award recognizes a member for excellence in teaching. By offering this award, APTA Geriatrics places value on those individuals who excel in presenting content on geriatrics in an engaging and dynamic manner.

Danille Parker, PT, MPT, DPT is a member of the academic faculty of

Marquette University where she has had a strong impact on her students in the area of geriatrics. Under her leadership, the geriatrics curriculum at Marquette has grown. She developed an advanced geriatrics course that has tripled in size over her 15-year tenure. Danille has a strong respect for the varied backgrounds that each student brings to the classroom, knowing that each of them brings a certain knowledge base and varied experiences from which they may draw and integrate into practice. She makes the content relative to geriatrics engaging and dynamic and she recognizes that the students today are her future colleagues, so she actively encourages their engagement with older adults.

Best Publication in JGPT

The Best Publication in JGPT award recognizes excellence to authors in geriatric physical therapy research published in the *Journal of Geriatric Physical Therapy.* This year, we recognize **Gunay Ardali, PT, PhD**, lead author for *Characteristics of Older Adults Who Are Unable to Perform a Floor Transfer: Considerations for Clinical Decision-Making*

Board Certified Geriatric Clinical Specialists

Bob Nithman, the Chair of the ABPTA Geriatric Specialty Council congratulated the 2020 new and renewed Board Certified Geriatric Clinical Specialists (see list on next page).

The following individuals started office after the February 2021 APTA Geriatrics Member Meeting. Thank you for your service!

President - **Cathy Ciolek, PT, DPT, FAPTA**
Vice President - **Greg Hartley, PT, DPT**
Director - **Jacqueline Osborne, PT, DPT**
Nominating Committee Member - **Jennifer Rouse, PT, DPT**
Balance and Falls SIG Nominating Committee Member - **Deborah Constantine, PT, DPT**
BH SIG Nominating Committee Member - **Marissa Lynn Cruz, PT, DPT**
CMH SIG Nominating Committee Member - **Rashelle Hoffman, PT, DPT, PhD**
GHAA SIG Vice Chair - **Jennifer Cruz Garcia Youssef, PT, DPT**
GHAA SIG Secretary - **Becca D. Jordre, PT, DPT**
GHAA SIG Nominating Committee Member - **Soshi Samejima, PT, DPT** and **Sushil Ramchandani, PT**
HPW SIG Secretary - **Jennifer C. Sidelinker, PT, DPT**
HPW SIG Nominating Committee Member - **David Michael Morris, PT, PhD, FAPTA**
RF SIG Vice Chair - **Jill FitzGerald, PT, DPT**
RF SIG Secretary - **Emma L. Phillips, PT, DPT**
RF SIG Nominating Committee Member - **Sarah Carolyn Smith, PT, DPT**

Outgoing Leaders

A final thank you to the following outgoing volunteers for their service to the academy.

- Nominating Committee - **Jill Heitzman, PT, DPT, PHD**
- Online Education Committee Chair - **Rolando Lazaro, PT, DPT, PhD**
- Academic Education Committee Chair - **Dale Avers, PT, DPT, PhD, FAPTA**
- Section Programming Chair - **Kathleen M. Walworth, PT, DPT**

We also express our appreciation to retiring State Advocates. Our academy is grateful to have the majority of our states represented and working at the local level to advocate for aging adults and the academy. Thank you for all you do to advance our profession.

Members Meeting

President Greg Hartley shared a list of open positions for the APTA National Board of Directors and Nominating Committee. He listed positions open for the APTA Geriatrics election in Fall 2021: treasurer, several directors, committee members, and SIG leaders.

A few highlights from the meeting:

- APTA Geriatrics has about 5,100 members and remains the fifth largest section of APTA.
- An external audit was conducted of fiscal year ending 2020. We ended the year in a strong financial position, largely due to a positive performance of investments. A balanced budget was passed in alignment with the new strategic plan.
- The strategic plan includes three key outcomes:
  - 1) Becoming a trusted resource for best practices,
  - 2) Leading in knowledge translation to facilitate lifelong learning and professional development, and
  - 3) Promoting the value of our industry and awareness of the geriatric specialty through advocacy.

Bylaws Discussion and Vote

During the past year changes in the APTA bylaws prompted the need to update APTA Geriatrics bylaws. In addition to a governance review committee, an attorney who specializes in non-profit corporate law in the state of Virginia and the APTA Parliamentarian were consulted for recommendations and review of language. These recommendations were presented in advance as written amendments to the bylaws along with a video explanation and Q&A of all questions received. During the meeting, a total of 3 amendments were brought forth and approved by member vote. The final vote to amend the bylaws significantly exceeded a 2/3 majority vote in favor of amending the bylaws.

The Awards Committee would like to thank all of the nominees and their supporters. Please consider honoring someone who is doing extraordinary work in geriatric physical therapy by nominating them for awards for 2022.

New Board Certified Geriatric Clinical Specialists - 2020

Rachelle Vera Abante, PT
Khaled Abozeid, PT, DPT
Christina Abramiuk, PT
Gabriel Alain, PT, DPT
Kelly Albers, PT
Diana Albert, PT
Janice Albores, PT, DPT
Jennifer Alden, PT
Sabine Alix, PT, DPT
Sarah Allen, PT, DPT
Chad Aly, PT
Rachelle Anderson, PT
Darren Anderson, PT, DPT
Caitlyn Anderson, PT, DPT
Lance Angelle, PT, DPT
Lakshmi Arumugam, PT, DPT
Jennifer Asuncion, PT, DPT
Steven Babcock, PT
Courtney Baileys, PT, DPT
Trevor Baker, PT
Archebal Balaoy, PT, DPT
Priti Balodi, PT
Benjamin Banas, PT
William Behrns, PT, DPT
Sharon Bentley, PT, DPT
Aileen Brew, PT, DPT
Elizabeth Burgess, PT, MS
Minerva Zaniebeth Cailao, PT
Anthony Cali, PT
Ma Antonette Calimag, PT
Jessica Calvert, PT, DPT
Michael Capps, PT, DPT
Maribeth Caranto, PT
Kenneth Cariaso, PT, DPT
Kristin Carlson, PT, DPT
Chan Casabal, PT, DPT
Melissa Casimir, PT, BSPT
Christine Cass, PT
Marian Princess Cerisier, PT, BSPT
Heather Chastain, PT, DPT
Elizabeth Choma, PT, DPT
Samantha Christensen, PT, DPT
Emily Clarke, PT, DPT
Kelsey Cocron, PT, DPT
Courtney Comstock-Elizondo, PT, DPT
Nicole Corsi, PT, DPT
Stephen Corvini, PT, DPT
Richard Courtney, PT
Merlynne Coy Kaminski, PT
Alison Coyle, PT, DPT
Julie Crenshaw, PT, DPT
Karen Anabelle Cuesta, PT, DPT
Lisa Cundey, PT
Dominique Da Silva, PT, DPT
Allyssa Blanche Dans, PT
Kristen Davis, PT, DPT
Osvaldo De La Cruz, PT
Gertz Kirby De Leon, PT, DPT
Ronald De Viana, PT
Jose miguel santino Del Mar, PT, DPT
Kathleen Delaney, PT, DPT
Brittany DePietropaolo, PT, DPT
Samidha Deshmukh, PT, DPT
Christina Diehl, PT
Elizabeth Dimaano, PT, DPT
Dianel Domingo-Cayoca, PT
Andrew Doubek, PT
Lyle Daniel DSouza, PT, DPT
Shannon Dudash, PT
Lindsay Dunstan, PT, DPT
Demmie Durham, PT, DPT
Rebecca Elmitt, PT, DPT
Ann Elsasser-Root, PT, DPT
Ramon Engracia, PT
Stephanie Eton, PT, DPT
Dean Evangelista, PT, DPT
Katherine Fagan, PT, MPT
Kara Farris, PT, MPT
Kathleen Farroba, PT, DPT
Cody Fisher, PT
Molly Fitterer, PT, DPT
Aaron Florea, PT, DPT
Jennifer Freda, PT, DPT
Diana Funk, PT, DPT
Elias Galvan, PT
Laura Garza, PT
Brittany Geiser, PT, DPT
Emily Germain, PT, DPT
Alexandra Germano, PT
Karl Gilliam, PT, DPT
Nora Gilligan-Havens, PT
Melissa Goff, PT, DPT
Kelley Gray, PT
Lauren Greer, PT, DPT
Marjorie Guarin, PT, DPT
Lisa Guillory, PT, DPT, MS
Alexandria Hajjafar, PT
Erin Halla, PT
Aaron Hannigan, PT, DPT
Alyssa Harrison, PT
Shelby Hart, PT
Victoria Harvey, PT, DPT
Melissa Hawkins, PT
Ellen Hosking, PT, DPT
Megan Howard, PT, DPT
Kathryn Howington, PT, DPT
Scott Humason, PT, DPT
Brittany Hutchens, PT, DPT
Amanda Hutcherson, PT, DPT
Michelle Iorio, PT, DPT
Rajeshwari Iyer, PT, DPT
Avani Jani, PT, MPT
Teena John, PT
Alice Johnson, PT
Courtney Johnson, PT, DPT
Garrick Jones, PT, DPT
Chelsea Jordan, PT, DPT
Paula Kaiser, PT
Felice Kawka, PT, DPT
Joy Kerrigan, PT, DPT
Kaylee Kimber, PT, DPT
Zackary Kleven, PT, DPT
Lisa Kokx, PT, DPT, MA
Nancy Laird, PT
Courtney Lancaster, PT, DPT
Zykia LaRue, PT, DPT
Mary Layshock, PT
Wanli Lei, PT
Emily Lesser, PT, DPT
Horace Leung, PT
Fatima Lewis, PT, DPT
Joshua Lindquist, PT
Peter Liu, PT
Brian Lloyd, PT
Roselie Louissaint, PT, DPT
Allison Lovering, PT
Deborah Madanayake, PT, JD
Phillip Magee, PT, DPT
Maureen Mancuso, PT, DPT
Brooke Marshall McGhee, PT
Beverly Martin, PT, DPT
Heather Mattson, PT, DPT
Sara Mayle, PT, DPT
Alexander McCulley, PT
Sean McFadden, PT, DPT
Jennifer McGrath, PT, DPT
Melissa McGuinness, PT, DPT
Karena McKenzie, PT
Benjamin McLane, PT
Amethyst Messer, PT, DPT
Kaileen Metzger, PT, DPT
Michael Miller, PT, MS
Charlene Miller, PT
MaryEllen Monteiro, PT, DPT
Monica Morales, PT
Beth Anne Morris, PT
Kaitlin Mullen, PT, DPT
Christina Murdock, PT, DPT
Maria Teresa Nakila, PT, DPT
Megan Nauman, PT, DPT
Boingoc Nguyen-Le, PT, BSPT
Wendy Nigro, PT
Rachael Nobbs, PT, DPT
Jennifer O'Brien, PT, DPT
Michelle Olson, PT, DPT
Brian Owens, PT, DPT
Lauren Pacho, PT, DPT
Wesley Pack, PT, DPT
Kathleen Palmer, PT, DPT
Nicole Pappas, PT, DPT
Avani Patel, PT
Alana Patrick, PT
Allyson Perrotti, PT, DPT
Brooke Pettyjohn, PT
Carlos Pineda, PT, DPT
Brenda Pipkin, PT
Emily Polakowski, PT, DPT
Jenifer Pugliese, PT, DPT
Venkatesan Rajagopal, PT, DPT
Jessica Reichl, PT, DPT
Neha Rekapalli, PT, DPT
Deborah Rentmeester, PT
Jillian Robinson, PT
Kelli Rogl, PT, DPT
Lindsey Rohde, PT, DPT
Seth Rohde, PT, DPT
Leigh Ronald, PT, DPT
Donna Ross, PT, DPT, MS
Nicolette Ruffler, PT, DPT
Emily Ruiz, PT, DPT
Erica Russell, PT, DPT
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Defining "Intensity of Therapy"

by Ellen R. Strunk PT, MS

A recent manuscript accepted for publication in the *Physical Therapy & Rehabilitation Journal* (PTJ) caught my eye as it likely did others. Its title was *Rehabilitation intensity and Patient Outcomes in Skilled Nursing Facilities in the United States: A Systematic Review.*[1] The reason it attracted attention is not a surprise.

Discussions about the intensity of therapy are not unusual and have dominated listserv discussions, online media content, and industry meetings for several years. However, the tone of those conversations has evolved. For many years, they were focused on the exponential increase in the level of therapy services delivered in skilled nursing facilities (SNFs) and home health agencies (HHAs) driven by what many perceived to be "incentives" in the prospective payment systems (PPS). When the Centers for Medicare and Medicaid Services (CMS) announced their intention to radically change the PPS for SNF and HHAs to the Patient Driven Payment Model (PDPM) or the Patient Driven Grouper Model (PDGM), the conversation quickly flipped. Discussions forecasted a reduction in therapy services due to the fact that they were no longer the "revenue producer" in these new payment models.

Then the Coronavirus pandemic raged throughout the country. All our energy and attention turned to keeping patients and ourselves safe. The Secretary of Health and Human Services (HHS) declared a national Public Health Emergency (PHE) and nursing facilities, assisted living facilities, and even the homes of older adults became a location many therapists were no longer welcome.

The last 12 months have probably created more questions than answers when trying to analyze practice patterns and data. CMS announced it would not be using data submitted in quarter 1 and quarter 2 (January 1, 2020 through June 30, 2020) for the post-acute care settings' respective Quality Reporting Program (QRP) compliance calculation, nor for public reporting. Regardless of whether the information will be utilized for these purposes, data submitted for purposes of payment will still be available to CMS as well as providers. Will it be possible to discriminate between patient outcomes related to *intentional* practice changes as a result of the PDPM or the PDGM versus *unintentional* practice changes as a result of the PHE? Can we appropriately attribute the effects of higher or lower therapy intensities that may have occurred?

This article is timely for the profession because it addresses questions that many have been grappling with over the last couple of years: Is a higher intensity of therapy more effective? Will lower levels of therapy have a negative impact on patient outcomes?

The authors of this study reviewed available evidence to evaluate the relationship between therapy intensity and patient outcomes in SNFs. With the exception of one study, they included all therapies (physical, occupational and speech therapy). Patient outcomes were defined as length of stay, discharge to the community, hospital readmissions, and functional improvement scores. Examples of the functional improvement measures are listed in Table 1.

Four studies examined the relationship between therapy intensity and successful discharge to the community or home after SNF admission. All four detected a consistent dose-response relationship of higher likelihoods of community discharge as therapy intensity increased. Although the magnitude of the effect varied across the studies, there was a dose-response relationship. Only one study examined the relationship between physical therapy hours per resident day and the risk for

Table 1: Examples of Functional Improvement Measures

Functional Independent Measure (FIM)	Measures function in 13 motor areas and 5 cognitive areas, with items rated on a scale from 1 to 7 (7 indicates total independence)
FIM divided by Length of Stay	A measure of efficiency
Short Physical Performance Battery (SPPB)	A measure of lower extremity function which includes gait speed, sit-to-stand, and balance items
Gait Speed	Gait speed scores have ben shown to predict disability, morbidity, and mortality
Ranking of independent in activities of daily living (ADL)	The Morris scale from the Minimum Data Set (MDS), with scores ranging from 0 to 28 (28 indicates total dependence)

hospital readmission; this only included residents post total knee arthroplasty and post total hip arthroplasty. The study demonstrated that in facilities with lower intensities of therapy (i.e. the lowest third of hours per resident per day), the risk for rehospitalization at 90 days post-event was higher than in those patients who received higher levels of therapy (i.e. the highest third of hours per resident per day). The studies included in this systematic review also varied in the functional improvement measure as well as clinical conditions they examined. Therefore the results were mixed, and the authors concluded the overall confidence in the evidence was low for function outcomes.

This systematic review can be used to generate important discussions among physical therapists and the rehabilitation industry at large.

1. Is there an opportunity to build better functional outcome measures for CMS to publicly report? Is there an opportunity within your practice to standardize functional outcome measurement in order to better understand the effect of your interventions across patient populations?

The authors admitted that the variety of functional outcome measures used in the studies they examined increased the difficulty of drawing correlations with any level of confidence. While it is generally accepted that there is no "gold standard" for measuring function in the SNF or other post-acute care settings, CMS is measuring functional outcomes. SNFs and inpatient rehabilitation facilities (IRFs) do have functional outcome measures publicly reported on Care Compare.[2] But are there other measures we could and should be using to capture the concept of functional improvement?

2. How often do physical therapists think about resource use measures such as Discharge to Community and Rehospitalization?

This study concluded there were stronger conclusions for the relationship between therapy intensity and community discharge. There is value in this outcome: for patients from a quality-of-life perspective and for policymakers from a cost perspective. Do you have your eye on these measures? Do you intentionally integrate interventions and teaching techniques that will impact these measures of value?

The message in the Policy Talk column one year ago is just as relevant, if not more so, today. Our profession is evolving; each and every physical therapist reading this – is responsible for our care practices. As this systematic review demonstrates, more therapy doesn't always result in a "better" outcome. Yet, lower levels of therapy may result in less desirable outcomes. As a profession and as individual practitioners, we need to better understand the relationship between our interventions and the outcomes of care.

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Editor's Message from page 5

Providence Health have documented the efficacy of their learn-on-the-fly strategy from 2020 and shares it on page 21. If you really want to see what a virtual fall prevention event looks like, they have graciously allowed *GeriNotes* readers to check it out (feel free to share with your colleagues and administrators).

Balance, and fall prevention, is actually a key component of 3 other articles in this issue. Actually, it is hard to find clinical physical therapy discussion and articles that fail to mention either ball or falls/prevention. Witness the appeal of the BFSIG. Carole Lewis and Linda McAlister in GetLIT present some great balance treatment strategies based on very recent literature that is replicable with even institutionalized elders. If you are treating those who fall, Alex Germano makes a compelling argument for examining their vestibular function (with easy to replicate tips), on page 12. The Otago Exercise Program is one of the most studied and familiar balance remediation programs and the focus for this month's Journal Club article. Is it also an upper body strengthening device? Read *Get A Grip* and join your peers for further discussion by attending the JClub webinar on March 16 (or catch the recording on-demand — available on our website within 2-3 days after the live event). Attending is worth 1.5 contact hours

Lots of good reading! And if the still chilly months make you want to continue your hibernation, there is a fascinating summary article on the importance of sleep. SnoozeOn.

Vestibular Fitness: The Missing Link to Optimizing Balance

by Alex Germano PT, DPT, GCS

The vestibular system plays an integral part in balance for the older adult but is a commonly under-examined and under-treated structure. Vestibular fitness is a term that implies the vestibular system is functioning optimally at its highest possible level. Vestibular organ function has important implications for falls, unsteadiness, and dizziness within the older adult population. Understanding how the vestibular organs function and which exercises directly stimulate them allows physical therapists in any setting to improve patients' vestibular fitness. Just as we understand the need to continue strength training throughout the lifespan, humans need to continue developing vestibular fitness with consistent input. All physical therapists have a role in developing and maintaining stimulation of this system.

The vestibular system gets overlooked in assessment and review of body systems. It is a small structure that cannot be readily visualized. For example, it is much easier to examine and "see" the deficits within the musculoskeletal system when you encounter a patient who may be on the frailty spectrum or someone who has a scoliosis. Pair these observations with a subjective report of pain and weakness and the musculoskeletal system will surely be examined. However, when a patient reports falls and balance dysfunction, many physical therapists will jump to standardized measures of balance examination such as the Berg Balance Scale or Four Stage Balance Test versus thoroughly assessing components that make up balance including visual, vestibular and somatosensory structures. In fact many physical therapists rely solely on patient subjective symptom description as the criterion for objectively measuring vestibular system function.

For example, if a patient reports to physical therapy after a recent fall but denies any rotary dizziness, a clinician might rule out the vestibular system based on subjective history without examining the vestibular system. Older adults often report dizziness differently than people who are younger; subjective accounts may not be reliable. Younger adults are 4 times more likely to report dizziness and older people are more likely to report unsteadiness and falls.[1] Despite this, up to 32% of individuals over the age of 40 have signs of vestibular dysfunction without complaints.[2] Muscle strength tests and other common balance outcome measures may miss the vestibular problems. Oculomotor exams and peripheral vestibular testing, such as the Modified Clinical Test of Sensory Interaction on Balance, may provide the details of vestibular dysfunction.

Physical therapists recognize that treatment of vestibular dysfunction has developed into a subspeciality that requires additional training and skills. This may lead to the assumption that all vestibular problems will be referred out and handled by "other" therapists. However, patients stepping into orthopedic clinics with pain, weakness, or after a fall may present with conditions such as presbyvestibulopathy[3] or subclinical vestibular deconditioning that will require an assessment and treatment much like the condition for which they were referred. Older adults would benefit if all physical therapists had a general comfort in assessing the vestibular system, treating with the vestibular system in mind, and feeling secure in knowing when to refer to a more specialized provider. An idea of how to screen the vestibular system can be found here.

Despite the normative aging processes within the vestibular system and decline across all cell types, functional loss is not completely linear.[4,5] Decline in the number of vestibular ganglion cells begins after age 30. Measurements of vestibular function of the otoliths begins to decline in ages 50-60 and vestibulo-ocular reflex after age 70-90.[6] Deterioration in vestibular functioning is not always due to the decline in the sensory structures within the inner ear but rather a change in how the signal is being processed by brain circuitry.[7] Much like the musculoskeletal system, it has been demonstrated that with increased levels of activity the vestibular system will maintain a normal level of function well into ages sixty and beyond.[8,9] Most interestingly, the vestibular system has been found to follow the reversibility principle in which a person will lose the effects of training after stopping physical activity.[8] Masters athlete populations continue to demonstrate the profound benefits of staying physically active. Research is even starting to determine specific activities that will help maintain higher levels of vestibular function. A study published in May 2020 demonstrates that master athletes competing in the sport Olympic weightlifting had better sustained vestibular function than competitive runners; this indicates the overall importance of providing large stimuli to otolithic organs throughout the lifespan.[10]

Improving vestibular fitness can be part of the role of any treating physical therapist. Clinicians can help combat the deconditioning of the vestibular system that

occurs concurrently with the decline in musculoskeletal function by ensuring that patients are performing exercises with enough otolith and semicircular canal activation, Many adults move around less and less as they continue to age. Less movement impacts both the musculoskeletal and vestibular systems. Physical therapists are experts in teaching people movements that can both improve musculoskeletal strength and provide stimulation to the vestibular organs.

Prescribing such dual exercise requires a general understanding of the vestibular system and its central connections as well as knowing of how to activate or load the otolithic organs and semicircular canals. The otoliths are located within the vestibule and are made up of the utricle and saccule. The utricle specifically senses horizontal plane movements and the saccule interpret vertical ones.[11] In these specific structures otoconia will shift in response to endolymph and cause movement of hair cells within them; this helps the body to sense linear accelerations. To activate these structures consider large movements in horizontal and vertical planes. Olympic lifting likely provides stimulation to the vestibular system by the large movement vertically, from a low squat, up to a tall standing position, and back to a low squat. Other exercises appropriate for stimulation to the saccule include jumping and bouncing. The utricle will respond to movements within the frontal plane, including using the translational vestibulo-ocular reflex, ducking side to side (in either sitting or standing) or hopping side to side. Consider having a patient visually fixate in order to work on gaze stabilization.

The semicircular canals are sensory structures that sense the movement of endolymph with specific head rotations.[12] The anterior, posterior, and horizontal canals will sense angular movement and trigger compensatory eye movements meant to help stabilize gaze.[12] These structures may be activated by moving a patient's head within the specific planes of the canals. This will require movement of the head on the body around the yaw and pitch axes for maximal activation. These types of vestibular organ specific exercises have shown to have promising outcomes on the management of balance disorders.[13]

The vestibular system can be deconditioned much like the musculoskeletal system when not used. It requires consistent input to remain functioning at its highest state and for one to have a high level of vestibular fitness. All clinicians should be aware of the state of both the vestibular system and musculoskeletal systems when providing exercises in order to provide these organs more sensory input. Increasing sensory input and vestibular function are treatment toward goals of decreased client report of dizziness and feeling unsteady.

See related videos:

Lateral Ducking for Utricular Function

Deadlifts/Bends to Floor on Foam for Vestibular Fitness

Head rotations on Foam for targeted SCC

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Alex Germano PT, DPT, GCS is a physical therapist practicing in the Annapolis, MD region providing outpatient services to older adults in their home with FOX Rehabilitation. Alex has been a CrossFit coach for eleven years which greatly inspires her practice. She has become increasingly interested in vestibular management by working with older adults and finding a need for more skilled interventions to help patients fight deconditioning in both the vestibular and musculoskeletal systems.

"Vertigo is the conflict between the fear of falling and the desire to fall" – Salman Rushdie

Impacts of Sleep on Healthcare Performance: A Focused Review

by Kenneth Miller, PT, DPT, MA; Sarah Miscisin, SPT; Abbie Lynn, SPT; Kevin Davies, SPT; and Taylor McCullough, SPT

Purpose: *To evaluate the impact of sleep on academic and clinical performance of healthcare students related to patient outcomes and determine the need for implementing sleep education in the Doctor of Physical Therapy (DPT) curriculum.* ***Methods:*** *The PubMed database was utilized to search for articles published in the last 15 years (2005-2020). The search included randomized controlled trials (RCT's), observational studies, case studies, systematic reviews, and peer reviews, published in the English-language, that assessed the impact of sleep, or lack of sleep, on cognitive and behavioral performance of those in the healthcare setting. Articles regarding pathoanatomical impacts, sleep disorders and sleep interventional studies were excluded.* ***Results:*** *Twenty-one articles were included in this review, focusing on cognitive effects of sleep deprivation and the impact of sleep on either healthcare student and worker performance.* ***Conclusion:*** *The review provides evidence is sufficient to recommend the implementation of sleep education into the curriculum of DPT programs.*

Sleeping makes up a third of our lives, and yet, without it, the remaining two thirds simply cannot function.[1] While we sleep, our brain goes through waves of light sleep and deep sleep. Through this, it takes our memories from that day and puts it away into its proper "filing cabinets" - memories that are not very interesting perhaps get discarded, while memories that the brain deems important get stored away for later use. Or, if a new memory is similar to an old memory or it modifies it in some way, then the new memory is added to that older one.[2]

Our brain being able to do this is an essential process, key to encoding vital information from that day and solidifying it as a memory for later use. Without it, both students and professionals alike suffer, and can even place others at risk. Such a prime example of this can especially be seen in the realm of health care. Health professionals such as nursing or medical students receive an exorbitant amount of information and medical knowledge in a very short span of time. Without proper sleep, grades and GPAs have been shown to suffer.[3, 4, 5, 6, 7, 8] But, it does not stop with school. When those same students are practicing in the real world, without proper sleep, medical errors are more likely, and patient outcomes suffer.[9, 10]

For nearly three decades, the US has been producing Doctors of Physical Therapy (DPT). DPT programs are vastly dense in musculoskeletal anatomy, physiology, and differential diagnoses, and share many of the same courses as their other professional counterparts (ex. nursing, medical, pharmacy).[11] And yet, physical therapists (PTs) arguably have up to three times the amount of average patient interaction. This being said, although DPTs share many aspects of the same curriculums and patient contact, there is still a complete lack of research into the same areas mentioned above: sleep and how it affects DPT student outcomes, as well as practicing PT clinicians and their patient outcomes. In fact, from a study conducted on practicing PTs, 75% of participants reported never receiving any form of sleep education during their programs, yet they almost unanimously agreed this should be included.[12]

As such, this retrospective research article aims to analyze how DPT students and clinicians are comparably affected by a lack of sleep, and make recommendations moving forward for PT schools to include sleep education in their curriculums. Our null hypothesis is that sleep has no impact on performance. We aim to prove that sleep has a negative impact on performance and thus should be included in DPT curricula.

Methods

Search Strategy

Four Doctor of Physical Therapy students from the University of North Texas Health Science Center in Fort Worth, Texas performed independent searches in PubMed based on 16 different, and equally divided, search terms related to sleep. Search terms were related to 5 different questions concerning the importance of sleep (refer to Figure A). The questions consisted of:

1. Would a sleep continuing education course provide sufficient knowledge to PTs?
2. What sleep education are other disciplines (ie MD, RN) given in entry level education?
3. Should sleep be in entry level PT students training?
4. How does sleep affect cognitive performance on entry level DPT students?
5. Why is sleep important to health?

The searches were performed to find relevant articles to any of the 5 questions in order to pick out which topic deemed most significant.

Selection and Inclusion-Exclusion Criteria

Article titles obtained from the original search were then reviewed by the individual students independently for their relation to question four, of which yielded the most search results. Articles excluded in this round contained information related to sleep diseases rather than effects of sleep loss. The next round of article reviews included abstract reviews, and articles were excluded when they pertained to pathoanatomical impacts of sleep loss versus cognitive and behavioral impacts. The last round consisted of performing annotated bibliographies of our remaining articles and analyzing their data of sleep impacts on healthcare setting performance. Refer to Figure B.

Results

The searches yielded 45 articles in total and included randomized controlled trials, observational studies utilizing a survey or questionnaire, systematic reviews, peer reviews, and case studies. The students performed title reviews and abstract reviews to narrow down the articles for a more focused approach to the goals of the paper. After the reviews were performed, 21 articles were included consisting of RCTs as well as observational studies utilizing a survey or questionnaire, systematic reviews, peer reviews, case studies. Overall, 6 articles focused on the cognitive effects of sleep deprivation, and nine assessed the impact of sleep on healthcare student performance. Four articles examined the impact of sleep on healthcare worker performance, and two articles evaluated perceptions of sleep.

Discussion

As mentioned earlier, due to the lack of research into the effects of sleep on solely DPT students or practicing PTs, the recommendations made were extrapolated and assessed based on research available for similar professions, such as nurses, physicians, and medical/pharmacy students.

Healthcare Student Performance

An article from the *Behavioral Sleep Medicine* journal found that in undergraduate students, lower cumulative GPAs: later bedtimes, later wake times, increased inconsistencies between bedtime/wake time and total sleep time, and increased nap time. Furthermore, the authors had also suggested that college students have more sleep flexibility than high schoolers or working adults, and so part of a college student's success lies in their ability to manage their sleep.[3]

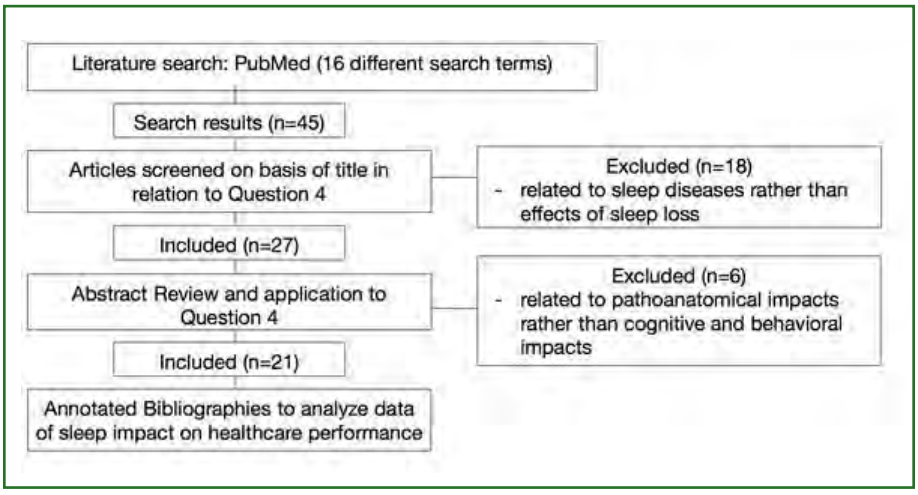
Building on this, a similar article by the *Sleep and Breathing* journal also looked at undergraduate students and found that only 42% of students were satisfied with their sleep. In the 42% group, they had only slept 47 minutes longer each night compared to the unsatisfied group. Now, besides satisfaction, for actual academic performance - the researchers split the data into those who had an above 3.5 GPA, and those who had a below 2.7 GPA. Turns out, both groups got right about the same amount of sleep each night, but the difference lies in the higher performing group going to bed earlier and waking up earlier.[4] Lastly, looking at a graduate pharmacy school study, 47.8% of students felt daytime sleepiness almost every day, and a whopping 81.7% had less than 7 hours of sleep the night before an exam. And yet, those who reported getting more sleep the night before an exam scored higher. However, the researchers caution this last statement, since even though the students who had more sleep the night before did better, it does not mean more sleep equals better grades. Instead, they postulated that perhaps those students slept more because they were

Figure A

Search Terms

Sleep duration
Sleep and cognitive performance
Negative impact of lack of sleep
Sleep education in healthcare
Sleep training
Sleep training in Physical Therapy
Sleep and mental health
Sleep perception
Sleep and college students
Effects of sleep on GPA
Sleep and energy
Sleep deprivation
Insomnia
Negative impacts of poor sleep
Low sleep and medical errors
Sleep and physicians

Figure B



better prepared and didn't feel they had to study.[5] A point can be made here about better study habits and exam prep can lead to better sleep habits. An observational cross-sectional study examining the impact of poor sleep quality on academic performance was conducted with undergraduate medical university students in Pakistan.[13] This study utilized the Pittsburgh Sleep Quality Questionnaire and used GPA to measure their academic performance. This study concluded that the mean GPA for students with poor sleep quality (2.92 ± 1.09) was significantly lower compared to students with good sleep quality.[13] The authors mentioned that faculty should educate students on proper sleep hygiene to improve their sleep quality to set the students up for academic success. Similarly, an observational cross-sectional study in Saudi Arabia looked at the relationship between poor sleep quality and stress levels among medical students.[6] The authors also utilized the Pittsburgh Sleep Quality Index scale to assess sleep quality, the Kessler Psychological Distress Scale to assess stress levels, and GPA to measure academic performance. The authors found a statistically significant association between poor sleep quality and lower GPA. Additionally, they found an overall high prevalence of stress (53.2%) and an alarmingly high prevalence of poor sleep quality among medical students (76%).[6] Again, the authors mention the importance of educating students on proper sleep hygiene and the deleterious effects of poor sleep quality on medical students. These include a lower GPA and increased stress levels.[6] Another observational study utilizing the SLEEP-50, a validated sleep disorder questionnaire, examined the prevalence of sleep disorders among college students and found that 27% of students were at risk for at least one sleep disorder, such as narcolepsy, Obstructive Sleep Apnea (OSA), Restless Leg Syndrome RLS/PLMD, and insomnia.[7] This is important because sleep disorders, such as OSA, can negatively affect cognitive functions such as attention, memory, and executive functions.[14] Additionally, they found that GPA was significantly correlated with the amount of sleep reported. The authors mention that students who got more sleep were those with higher grades.[7] Finally, a longitudinal observational study utilizing a survey was performed with college students during the spring semester of their freshman year and then again during the spring semester of their senior year. The goal was to assess the relationship between sleep quality and GPA and between sleep quality and graduation rate.[8] They found a high prevalence of sleep deprivation among students (42%), and it was negatively associated with GPA. Also, students who reported sleep deprivation during their senior year were 25% less likely to graduate than students who reported no sleep deprivation.[8]

In a similar study in India, researchers also set out to assess the changes in the performance of medical students that occurs after 24 hours of sleep deprivation.[15] They used simple paper-pencil tasks to examine vigilant effects. The subjects were tested 6 different times between 8 a.m. one day until 8 a.m. the following day. Results showed a significant increase in errors made during the tests. The students also required more time to complete the tests as the day progressed, although that change was insignificant. Researchers found that the tasks requiring sustained attention were affected by sleep deprivation, with the effect being more on judgement ability than response speed.[15] Consequently, the effect is more in complex tasks rather than simple ones, leading to an increase in errors. To relate back to PT students, the necessary performance needed for a DPT program can be compromised in examinations due to the need to navigate several complex tasks such as critically choosing and responding to similar appearing responses.

In a study by Okano and colleagues, sleep measures accounted for nearly 25% of the variance in academic performance.[16] 100 students wore activity trackers to objectively measure and assess the association between sleep and performance on quizzes and midterm examinations. On average, the students went to bed at 1:54 a.m. and woke up at 9:17 a.m. It was found that the students who went to bed before the average bedtime had significantly higher overall scores compared to the students who went to bed after the average time ($p < 0.0001$). The students who woke up before the average wake-up time also showed better scores than the students who woke up after the average wake-up time ($p < 0.001$). Negative correlations were also found with both findings suggesting that an earlier average bedtime and wake-up time were associated with a higher overall score. There was also a significant positive correlation between average bedtime and average wake-up time ($P < 0.0001$), suggesting that students who went to bed earlier tended to also wake up earlier. Researchers also found a positive correlation between average sleep duration (7 hours, 8 minutes) throughout the semester and overall score ($p < 0.0005$), indicating that a greater amount of sleep was associated with a higher overall score. There was a significant negative correlation between sleep inconsistency and scores ($p < 0.001$), indicating the more sleep inconsistencies, the lower the scores. Overall, researchers found that better academic performance in college was strongly associated with better quality, longer duration, and greater consistency of sleep.[16] Similarly, sleep inconsistency affected performance as well. With college students, it is usually seen in the form of not enough sleep during the week followed by oversleep on the weekends.

Recommendations for PT schools

To be a CAPTE accredited PT program, there is no requirement for a uniform schedule layout. Some of the following variety are as follows:

- Fully online/hybrid programs: students can typically watch their online lectures whenever they want, so long as they meet their assignment deadlines (ex. University

of Baylor, University of South College, or University of St. Augustine Flex Program).[17]
- Standard college semester programs: students at PT programs that are part of larger universities start and finish a semester with the same classes, such as taking Anatomy M-W-F from 8-10 a.m. for 15 straight weeks (ex. Angelo State University).[18]
- Block schedule programs: students at PT programs that are part of Health Science Centers typically have a 15-week semester, but the semester is broken into individual or overlapping "blocks", such as starting the semester with a 4-week Cardiopulmonary class, and then starting a 6-week Anatomy class (ex. University of North Texas Health Science Center).

From the above variety of PT program schedule layouts, it can be seen how vastly different student's sleep schedules could be. The online programs may or may not have incentives for students to go to sleep early or wake up early, the standard programs may perhaps have the best sleep routines, and the block programs can vary on sleep quality depending on the rigor or layout of the given block they're on. Thus, by taking the studies discussed above, all PT programs - regardless of schedule layouts - should implement sleep education into their curriculums so that their DPT students can become more aware of their own sleep habits. By making minor changes from the aforementioned findings (ex. get 47 minutes extra sleep, go to bed earlier, wake up earlier, nap less, be consistent every night, sleeping more the night before an exam), DPT students could very well achieve better program success, as well as retain more of the long-term information they'll need for the licensing exam.

Healthcare Worker Performance

Physician residents are undeniably overworked, and it was only in 2011 when the mandatory 80-hour work week cap was placed, not only for them, but also for their patients' health. In a study by Barger and colleagues, they found that If a physician resident had worked a 24-hour+ shift 4 or fewer times in a given month, then they had a 3.5 times chance of making a "significant medical error." Even worse, if a resident worked that same 24-hour+ shift 5 or more times in a given month, then that number jumped to 7.5 times. Plus, they experienced significantly more trouble paying attention during lecture/rounds/surgery, and they were three times as likely to have one of those "significant medical errors" result in a fatality.[9] In a related article also by Barger, but with other colleagues, they found that physician residents who worked those 24-hour+ shifts were 2.3 times more likely to have a car accident on the way home, or 5.9 times more likely to have a near-miss car accident, and 1.6 times more likely to cut their skin on accident (ex. needlestick, scalpel). Speaking of needlesticks, they also looked at nurses, and nurses who worked 13-hour+ shifts were also at an increased risk of needlestick injuries.[10] The evaluation of surgeons during 17-hour night shifts yielded different results, however. Researchers found that with objective tests, surgeons found a way to compensate for the psychomotor and cognitive deterioration that occurs following sleep deprivation.[19] Furthermore, they failed to prove that patient safety was at risk due to this. It is important to note that sleep disturbances subjectively had an impact on the surgeons. Being aware of the effects, researchers hypothesized they applied different mechanisms to cope with fatigue.

Recommendations for PT schools

Physical therapy work week hours are not quite comparable to the demands of the above physician residents or surgeons in the sense that a PT will perhaps never work a 24-hour+ shift or an overnight shift. But, it is not unheard of for a PT to work a 12-hour shift, or uncommon for a PT to work 4 10-hour shifts to satisfy a typical 40-hour work week. That said, work endurance and work fatigue is individual to everyone, and so working 10-12 hour+ shifts could understandably cross that threshold into creating medical errors, especially if those shifts are back-to-back. Not to mention, in today's healthcare climate of decreasing insurance reimbursement rates coupled with rising tuition costs, more PTs are easily crossing the 40-hour work week in order to pay off student loans by picking up extra shifts or working PRN at a second job.[20] By making recommendations to PT programs to include sleep education, DPT students can set themselves up for the future for a healthier career, fewer medical errors, better patient outcomes, better work-life job satisfaction, and their own safety.

In the study using surgeons, researchers assessed recent graduates versus more experienced healthcare providers using a simulated ward environment. They found that the more experienced providers were more thorough in their assessment and that the recent graduates were responsible for 15 out of the 23 adverse events that occurred during the simulation.[19] They explained that proper education of interns and strengthening their clinical power of judgement could improve patient safety. It is the same case with PT students. If it is likely that new graduates will make more errors, sleep deprivation will only make things worse. Implementing sleep education in DPT school curricula is a way to strengthen clinical judgement and consequently improve patient safety.

Cognitive effects

Studies of psychomotor functioning in people with sleep disturbances or chronic sleep-onset insomnia have yielded mixed results due to the ability of this population to effectively compensate under normal daytime functioning and activities. It has been proposed that persons with insomnia may have latent performance deficits which explains how some are able to effectively compensate the following day. In a study by Hansen and colleagues, they

proposed a different measurement tool - psychomotor vigilance test (PVT) to better understand the scope of the impairments stemming from sleep deprivation. A PVT is a serial reaction time task with high sensitivity to sleep loss induced impairments. The researchers primarily focused on lapses of attention and they found that the number of lapses in the experimental group was low during the first 16 hours of wakefulness and then increased substantially when wakefulness extended beyond 16 hours.[21] The experimental group showed about twice as many lapses of attention, more than twice as many false starts, and approximately twice as big a time-on-task effect as the normal sleepers group.[21]

Additionally, a study by Posada-Quintero and colleagues reported that after 14 hours of sleep deprivation, active thinking, and the ability to focus diminished.[22] Sleep deprivation contributed to the lack of rapidness in subjects' ability to make reaction decisions, which in a healthcare setting is imperative to the patients' lives we encounter each day. This ability to make rapid reaction decisions involves parts of memory, matching and motor functions. The researchers' study discovered a correlation between oscillatory brain activity and performance when performing an error awareness task. Quantitative measures of brain activity were taken to show the correlation of reactivity and response inhibition. The results reported that reactivity and response inhibition reached a steady level between 6-16 hours of sleep inhibition but sustained impairment occurred after 18 hour.[22] When considering the normal workday for a practicing physical therapist, where work days don't end as soon as the last patient session does, but rather several hours later once the day's documentation has been completed, the ability to recall memories is crucial. Sleep deprivation can lead to mistakes in documentation or even wrongful conclusions about patient progress.

Daytime consequences of insomnia and sleep disturbances in general are poorly characterized. A study by Shekleton and colleagues set out to identify neurobehavioral impairments associated with insomnia and to examine the relationship between the impairments and subjective perceptions of sleep and daytime dysfunction.[23] Regarding subjective perceptions of sleep, the insomnia group reported significantly less total night sleep time and lower sleep efficacy, longer sleep onset latency, more wake after sleep onset, and higher standard deviation of sleep onset latency ($p < 0.007$). They also reported significantly higher levels of fatigue, depression, anxiety, and sleep disturbance, as well as poorer mental health related quality of life than the control group ($P < 0.002$).[23] Objectively, switching attention and working memory were significantly worse in insomnia patients, while no differences were found for simple or complex sustained attention tasks. In insomnia patients, worse attention performance was correlated with reduced health-related quality of life. Shekleton and colleagues concluded that insomnia patients exhibit deficits in higher level neurobehavioral functioning, but not necessarily basic attention. They also imply that the deficits are due to neurobiological alterations, rather than sleepiness resulting from chronic sleep deficiency.[23]

Not only is one's ability to recall memories and make rapid clinical decisions deem important but so is establishing patient rapport. As healthcare professionals that spend a significant amount of time one-on-one with patients, it is often difficult to form a layer of trust and comfortability when there is lack of optimism, motivation, and drive. A study by Kaida and Niki found that flow experience, or the emotional state when a person perceives balance between challenges associated with situation and their capabilities to accomplish or meet the demands of the situation, as well as positive mood, and psychomotor performance all decreased, while negative mood increased for individuals in the study after one night of total sleep deprivation.[24] Flow encompassses level of confidence, ability to achieve goals, and positive emotion, all of which can play a role in how a clinician carries themselves in conversations with their patients.

Recommendations for PT schools

Educating doctoral level physical therapy students on the impact lack of sleep can play a role in their everyday treatment sessions and patient encounters can hopefully lead to more positive patient outcomes overall. A systematic review study by Parker and Parker, found that napping and increasing nighttime sleep length can help prevent acute sleep deprivation effects such as impaired immune system and working memory, as well as increased attention failures which have led to medical errors. They suggest implementing stretch breaks every 20 minutes, as well as shortening the length of workdays because healthcare workers working longer than 12 consecutive hours are ultimately putting their patient's health at risk as well as damaging their own.[25] Providing this information to physical therapy students in their schooling can hopefully prevent them from taking on too many patients and too long of hours in their working future.

Limitations

One of the limitations across studies utilizing self-questionnaires or surveys comes in the form of subjectivity — the researcher must rely on the participants to accurately and introspectively reflect upon their sleep and how it corresponds with their school success or work outcomes. In addition, the questionnaires would ask about sleep amount, but not quality. For example, while two people can both sleep 8 hours, one person may have been in a deep slumber, while the other has sleep apnea, a lumpy bed, or is stressed about external life factors.

Nurses and physicians' residents both tend to be very busy, and so those who actually took the time to reply to the questionnaires or surveys may have a vested interest

in the issue, thereby creating a possible reporting bias. In addition, relating to the subjective portion mentioned above, they may have purposefully not reported their own medical errors on the questionnaires/surveys due to internal conflicts (emotional feelings of guilt/shame/fear of humiliation), which would skew the data.

Due to ethical reasons, it is recognized that conducting a well-designed randomized controlled trial to determine the true effects of fatigue on performance in clinic and in surgery is nearly impossible without putting patients' health and lives at risk. However, we can use the results of these previous studies as a means to educate DPT students on the importance of getting enough quality sleep in order to avoid making mistakes on the job that can put our patients in harm.

Conclusion

This review aimed to examine the growing body of literature demonstrating the need to incorporate sleep education in Doctor of Physical Therapy school curricula. This paper has shown the negative and detrimental effects sleep deprivation can not only have on an individual, but on their environment as well. Some of the effects found were increased fatigue and sleepiness, impaired school outcomes, decreased work efficiency, impaired memory recollection, critical decision making, increased medical errors, impaired cognition, and much more. Due to the abundance of possible consequences that could result from poor sleep, physical therapists could definitely benefit from receiving sleep education before becoming professional healthcare providers, to help improve the quality of life for themselves and their patients, strengthen clinical judgement, and improve patient safety.

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Tai Chi instructor, Fred Bruderlin, teaching attendees Tai Chi at the Lake Oswego Community Cetner in Oregon during an in-person Natnal Fall Prevention Awareness Day evet in 2019.

Staying Flexible: Adapting Fall Risk Programming

by Jamie Caulley, PT, DPT and Colleen M Casey PhD, ANP-NP

The National Council on Aging (NCOA) promotes National Fall Prevention Awareness Day in September to coincide with the first day of fall. In 2020, the NCOA expanded the day to a full week of awareness in order to bring more attention to the national healthcare crisis of fall-related deaths and injuries in persons 65 years and older.

Providence-Oregon is a large non-profit health system with 8 hospitals, 44 primary care clinics and 32 outpatient rehab clinics in the state of Oregon. For the past 5 years, *Staying Healthy and On Your Feet*, an in-person fall risk event, has been offered to over 1,600 community-dwelling older adults across Oregon, mostly during the month of September. These 2-hour events have included:

- An educational presentation on modifiable fall risk factors taught by physical therapists (PT), and/or occupational therapists (OT), and geriatric-trained pharmacists (PharmD).
- An active Tai Chi demonstration taught by a local instructor.
- An optional, individual high-risk medication review with a pharmacist.

It became clear by April 2020 that we would be unable to offer in-person events due to COVID-19 pandemic closures of community and senior centers, as well as capacity limitations on gatherings throughout the state.

The NCOA aptly stated in 2020: "The coronavirus pandemic has changed a lot of things. One thing that's still the same? Falling is NOT a normal part of aging. There are steps you can take to reduce your risk."[1] With awareness and education on fall prevention remaining a priority for the Providence Senior Health Program, we pivoted to a virtual format.

The pandemic has affected seniors and fall risk in many ways. Falls and acute functional decline are more common presenting symptoms of COVID-19 than fever in adults age 80 years and older.[2] Many types of traumatic fracture decreased, while the prevalence of hip fracture has remained stable or increased during the time of the pandemic.[3,4] Patients diagnosed with hip fracture during the pandemic had more fractures occur in their homes, had higher levels of fragility, lower baseline physical activity levels, and higher mortality rates than their pre-pandemic cohorts.[5]

Virtual Event Details and Logistics

The number of participants did not need to be limited with a virtual event; the number of fall prevention offerings was reduced from 12 to 3. This required fewer speakers to train and coordinate with the new technology. Events were organized to be geographically diverse. Events were based out of the Portland Metro and Southern Oregon regions to capture a broad statewide audience.

Marketing materials were also shifted online including digital flyers, email distributions, electronic newsletters, utilization of social media, and news story coverage. Presentation handouts and follow-up surveys were both online and emailed to participants after they registered. Registration was coordinated through online sign-up or telephone calls by the Providence Health Education Department.

Microsoft® TEAMS became the virtual platform because it was already supported by our organization. This format allowed speakers to be in different rooms, buildings, or even states when they presented. The event moderator, the lead PT, facilitated introductions, speaker transitions, and question and answer portions of the event. A Tai Chi demonstration, using a pre-recorded YouTube video instead of a live instructor was included. We could not offer 1:1 pharmacist medication reviews, as we had at past in-person events, due to the logistics of coordinating 1:1 meetings online and privacy concerns.

Each participant received a link to an online Select-Survey at the end of the event. Results were aggregated across events. The survey prompted the participants to describe 3 behavioral modifications or fall risk reducing goals that they would focus on as a result of the events.

Results

A total of 90 participants attended the virtual events, with 63 surveys completed. Most participants were female (48). Participants aged 20-50 (19) were the largest demographic group; the smallest number of participants were age 85 and older (1).

Participants rated their fall risk using the Centers for Disease Control's STEADI (Stopping Elderly Accidents Deaths and Injuries) self-assessment questionnaire, with an average score of 3.7. The questionnaire has a total possible score of 14, with a score of 4 or more reflecting someone who is at risk of falling. A score less than 4 indicates lower risk to fall.[6] Only 16%, or 4, virtual participants reported a fall in the past 12 months. Participants rated the ease of accessing the virtual event a 6/10 with 0 = no difficulty and 10 = impossible.

Participants committed to address 3 top areas as a result of what they learned during the virtual event. The top-ranking categories were reported as: home safety (50% of participants); getting more exercise (46% of participants); and being more aware of limits/using more caution (33% of participants).

Discussion

We were familiar with the profile and survey data from participants who previously attended in-person events. This allowed us to examine the differences and similarities between the 2 event formats. The demographics of participants who attended the virtual events differed from past in-person events. Virtual participants were younger, reported a lower fall risk score and fewer falls in the preceding year (See Table 1).

A lower proportion of virtual participants were over the age of 65 (40% virtual vs. 96% for in-person events). Of virtual participants aged 65+, more could be categorized as 'younger" older adults in the 65-74-year age group (14); only 10 virtual participants were in the 75-84 age group; 1 participant was aged 85 years or older. The majority of in-person participants were aged 75-85 years of age. A majority of participants were female for both virtual and in-person events.

The difference in participants' age between groups could be attributed to younger adult foster home caregivers participating in the event; this may also reflect older adult's lack of comfort with technology. Technology use in older adults has been steadily increasing since 2000, but still lags behind those who are in younger generations. According to the Pew Research center, "In 2000, 14% of those ages 65 and older were Internet users; now [2019] 73% are."[7] The COVID-19 pandemic has further accelerated the use of technology among older adults, with 51% reporting purchase of a new technology product in the last year. Yet only 29% of older adults in the United States have used video conferencing services.[8]

Table 1. Characteristics of participants of virtual and in-person fall risk events

Results	Virtual Event (2020) n= 63	In-person Event (2019) n=194
Largest age group (years)*	20-50	75-84
% of female participants	77%	79%
Average fall risk score (0-14),with 4 or more reflecting a higher risk to fall	3.7	6.2
Average attendance per event	30	16
% of participants reporting a fall in the year prior	16%	48%
% of speakers receiving scores of good to excellent	85%	100%

*-Age groups were categorized as 20-50 year; 50-64 years; 65-74 years; 75-84 years; and 85+

Benefits of the virtual event format

Data showed participants in the virtual event came from a wide geographical range, including participants from out of state; higher attendance numbers per event (30 average per virtual event versus 16 per in-person event); attendance of adult children with their older adult parent(s), and the attendance of 18 adult foster home providers at the events. The new virtual event was approved for continuing education credit by the Oregon Department of Human Services for AFH providers; this likely motivated their attendance.

Limitations

The Microsoft® TEAMS platform was new to most of the presenters and participants. Despite technology challenges, the majority of registered participants were able to log into the event successfully and, based on post-event surveys, demonstrated appropriate content learning. In prior years, 100% of participants rated the speakers as good to excellent, while only 85% of participants in the virtual events noted the speakers as excellent or good. We believe some of the technology issues may have influenced the ratings of the speakers.

Pharmacy and rehabilitation presenters were Providence employees and therefore able to use the same Microsoft® TEAMS application. Providence does not employ Tai Chi instructors with the same software permissions. A pre-recorded video demonstration of Tai Chi was used during the event instead of a live demonstration. Participants were encouraged to watch and try at their own risk, with safety precautions provided. While the Tai Chi video recording did inspire some participants (16%) to seek further Tai Chi exercise resources, it did not achieve this goal as well as in past year's events (23%).

The virtual platform provided some engagement challenges. As previously noted, higher risk, older adults did not attend the events at the same rate as at in-person events. Technology use among older adults does correlate with age and with higher levels of education.[9] Therefore, it is likely that the virtual platform may not ideally engage older members of the community, especially those who have lower educational levels.

Overall the virtual events were less interactive; interactions between the speaker and the audience required more facilitation. Participants were encouraged to keep their cameras on during the presentation and to ask questions in the chat box during and after the event, but spontaneous questions, the sharing of stories, and collaborative nods and laughs were not possible in this online format.

Future Considerations

Presentations became smoother and easier with each of the 3 hosted events. It was clear that some participants (children and other caregivers of older adults) benefitted from the virtual event platform and that continuing with a mix of virtual and in-person events would promote the greatest participation across the broadest audience mix. Perhaps some evening presentations would be ideal to allow working family members and/or working older adults to attend more easily. Partnering with community and/or senior centers that already have a user base familiar with participating in virtual events (through each center's platform) would likely allow the virtual events to be easier for the organizers, presenters, and participants. Additionally, there is likely merit in offering fall risk events to the population of young older adults who are at lower risk to fall; they have more opportunity to make an impact on various fall risk factors with appropriate education and interventions. Events could be tailored specifically to care providers, such as adult foster home caregivers. Virtual events might be targeted to a slightly younger, less risk to fall and a more highly educated audience, whereas in-person event content could be more focused on higher risk individuals with more varied educational backgrounds.

Of note, we typically send out follow-up surveys 3-4 months post-in person events inquiring about changes maintained since the event. This data on our virtual events is not yet available at time of publication.

Conclusion

Overall the transition to a virtual format from our regular in-person fall risk events was successful, especially in the context of a global pandemic. Attendance per event was high and regional distribution was broad. The virtual platform offered some technology challenges for both presenters and participants but overall, based on surveys, it appears the content was well understood. The virtual events definitely catered to a different profile of participant than the in-person events. In the future, we believe there is merit in offering a mixture of virtual and in-person events, as this has the potential to reach the broadest population of participants across ages and fall risk levels.

Shifting to virtual events rather than cancelling health promotions and wellness has been a national challenge. Want to visualize what it could look like? Jamie Caulley PT, DPT and Providence Health have graciously given us permission to share one of the recordings of their late 2020 Fall Prevention virtual community training sessions. Watch now!

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My Journey from Geriatric Physical Therapist to Online Weight Loss Coach

by Morgan Nolte PT, DPT

I quit my job. No more steady paychecks. No more benefits. No more predictable hours or regular schedules. After working hard to complete my education and secure employment, I never imagined leaving the practice of physical therapy unless it was to move up the corporate ladder. And yet, here I am, in my early 30s, an entrepreneur and owner of an online weight loss and wellness business focused on helping women over 40 avoid, delay, or minimize the need for geriatric physical therapy.

You may be thinking, "Why would she leave a stable, well-paying job with benefits?" "Why attempt to build an online health-related business with virtually no business training or computer skills?" My family and friends asked the same questions. Starting a business was a huge step for me. Doing so online was a skydive out of my comfort zone. Why did I do it?

I could write a book about the geriatric patients I treated in physical therapy who suffered financial, physical, mental, and emotional burdens from diseases like diabetes, heart disease, arthritis, dementia, and cancer. Most of these could have been prevented had the underlying causes of their diseases been addressed in earlier years.

One particular patient brought into sharp focus the importance of proactive weight loss and wellness. This patient's morbid obesity led her to be bedbound for over 10 months. She was being transported via stretcher into her home and had to be turned sideways to fit through the door, subsequently sliding off the stretcher and onto the door threshold. She literally fell off the stretcher. Her primary care provider prescribed homecare physical therapy and occupational therapy as a "last glimmer of hope." Her diet was terrible and consisted primarily of processed and refined carbohydrates. She alternated her food choices with doses of insulin. A mechanical lift was required to get her out of bed. Her situation tore at my heart yet was largely preventable.

One thing I learned early in my geriatric residency training was pattern recognition. Excess weight is so common; it often is not even listed in the past medical history, having been assumed, discounted, or overlooked altogether. As I reflected on this particular patient's case, I noticed a pattern among my geriatric physical therapy patients. The vast majority were overweight or obese. Most had significant and multiple co-morbidities like diabetes, cancer, arthritis, heart disease, or cognitive impairment. Most importantly, these people had no idea what "healthy" meant. Most were in no place to make the lifestyle changes needed to see optimal outcomes.

In contrast, I noticed that the few geriatric clients that I treated who were at a healthy weight had far fewer complications and co-morbidities, with much better prognoses and outcomes. I kept thinking to myself, "If only I could have worked with these people 20 years ago to help them lose weight and get healthy, they could have

largely prevented the very conditions that landed them in geriatric physical therapy."

In my contact with patients' family members, I often saw their adult children following along in unhealthy footsteps. Closer to home, I recognized many of the same behaviors and risk factors in my own parents. This caused me to look more closely at adults who were not 100% healthy but weren't clinically sick either. They were in what I like to call the "grey zone" of health care. People in the grey zone have one or more underlying risk factors like high blood pressure, high triglycerides, high blood glucose, a sedentary lifestyle, poor nutrition, chronic stress, sleep deprivation, and excess weight. While such risk factors may be manageable in one's 40s and 50s, they often become contributing co-morbidities that cannot be reversed as a person ages.

New research shows that over 40% of Americans are obese with a body mass index (BMI) of 30 or greater, and another third of Americans are in the overweight category with a BMI of 25-30. More than seven out of every ten adults in America are either overweight or obese. More than one in three adults have prediabetes; of those, 84% of them do not know they have prediabetes. If losing weight and keeping it off was easy, we wouldn't have these problems. Yet, here we are with a diet success rate of less than 5%.

My curiosity was piqued. I searched to find someone who was helping women in the grey zone get healthy and stay healthy, to reduce their risk factors and the likelihood of developing preventable disease. I found no one filling that need. My search led me to explore more questions: "Why are so many women over 40 overweight or obese? How does menopause affect a woman's health? Why do obesity, diabetes, and heart disease frequently occur together?"

Extensive research revealed the answer to be insulin resistance. Insulin resistance is at the heart of obesity, high blood pressure, high blood glucose, high triglycerides, inflammation, and other risk factors so often present in the grey zone and in the people whom I was treating in physical therapy. As I learned more about insulin resistance, the meaning of, "When the tide comes in, all boats rise," became apparent. That is, reduce insulin resistance, and all health conditions improve.

I had personal experience with losing 20 pounds and keeping it off. I knew my passion and skills could be put to good use in a science-based weight loss program for women over 40. Starting this business became the first thing I thought of when I woke up, and the last thing I thought of before I went to sleep. Developing a program to help women lose weight, keep it off, and prevent disease became my professional goal. Just 4 months after my son was born, I started my business with my vision, education, experience, resourcefulness, determination, and a whole lot of faith.

After thousands of hours of research on how to start a cash-pay physical therapy business, scope of practice nuances, Medicare rules, weight loss science, disease prevention, and habit change techniques, I ultimately chose to be a cash-pay, weight loss and wellness practice, rather than a traditional physical therapy practice. I wasn't comfortable with the risk of providing cash-pay services to Medicare beneficiaries. There are differing opinions about such services. It was a moot point for me because Medicare beneficiaries already needing physical therapy were not my target market.

The administrative burden of being in-network with any insurance provider or being an out-of-network provider was too high given the likelihood that the weight loss and wellness services I intended to provide would not qualify for insurance reimbursement. This struck me as ironic. Many women would likely develop preventable conditions and diseases without these services, treatment for which may or may not be covered by insurance.

The problem I wanted to solve was straight-forward — helping women reduce insulin resistance for sustainable weight loss and disease prevention. I would do this through lifestyle changes that lowered insulin resistance and inflammation through an easy-to-learn, easy-to-follow program of proper nutrition, exercise, better sleep, and stress management. While pieces of the program existed elsewhere, I found no integrated program that was geared toward my target market.

The author offers a masterclass on how to lower inflammation and insulin resistance. See a portion here and then learn more about the full program.
Watch now!

I believe that when people know better, they do better. People in the grey zone just did not know about insulin resistance. They did not know how much their current lifestyle choices contribute to disease later in life, and were stuck in the "calories in versus calories out" model of weight loss.

My target market is primarily women over 40 who have spent their whole life cutting calories, eating low-fat, not getting enough protein, and severely neglecting strength training. I have had success in helping these women reframe their mindset from a focus on caloric intake to a reduction in insulin, with an emphasis on sustainable behavior change.

I had to determine the best type of business model to use once I defined my target market and the big picture. One-on-one coaching was where I would start. The traditional 6 to 8-week physical therapy plan would not be sufficient. The behavior changes my clients needed to make for sustainable weight loss take longer than 8 weeks and would need to last a lifetime.

I started with personal, often in-home sessions, with individual clients and built from there. I relied in large part on word-of-mouth and community service, such as

presenting free programs at the local community college. As my client base grew, I recognized that I needed to set realistic expectations and boundaries in order to prevent my business from ruling my life. I wanted to design a model that was scalable, so that over time I could work less, earn more, and impact as many lives as possible.

To make such a model, I converted my weight loss program and all the one-on-one education I was providing in an online course and coaching program called Weight Loss for Health. I believe it is the only comprehensive program that addresses all key components of weight loss and behavior change. My program includes follow-through, proper nutrition, intermittent fasting, healthy sleep, stress management, and effective exercise. It addresses common weight loss difficulties such as how to end emotional eating, carb and sugar cravings, breaking past a weight loss plateau, maintaining weight loss, and lowering insulin resistance and inflammation.

One of the cardinal rules for habit change is to make things easy. To do this, I offer a lifetime program membership, have weekly office hours by computer conferencing, and host an online community for my members. This allows me to grow a sustainable support system, no matter where a program member resides. Program members live all over the country and world including members in Canada and Dubai. Locally, I continue to offer one-on-one wellness and weight loss coaching.

Clients see substantial results: weight and inches lost, blood pressure lowered, improved lipid panels, blood glucose and A1c lowered, and improved bone mineral density. They are often able, in consultation with their physicians, to reduce medications or avoid the need for medications all together. These results provide them, and me, with great satisfaction. I am helping them prevent polypharmacy, illness, falls, and hospitalizations. In turn, my clients are experiencing a higher quality of life and greater confidence in their health.

In addition to my online course, coaching, and community, I expanded into the online education space with weekly YouTube videos and podcasts. Those activities have allowed me to connect with other online experts to reach people far beyond my local community.

Up until this point, I have been discussing the "front-facing" side of my business, which is what other people see. But what I have found to be the most fascinating, and the biggest surprise in my own journey, is what goes on behind-the-scenes to make the front-facing aspect of the business possible.

Learning about insulin resistance and developing content for an online program was the easy part for me. I found the real challenges came first, with technology, marketing, and sales, and second with my own self-limiting expectations and beliefs. Contrary to the Field of Dreams' slogan, "If you build it, they will come," building and growing an online business is not automatic. You have to work at it — relentlessly. In my case, it required learning many technological and business skills that I either did not know existed or with which I had no experience. To name but a few: I have had to learn about leadership, creating websites, copyrighting, search engine optimization, graphic design, email marketing, shooting and editing YouTube videos, podcast production, product positioning and pricing, expanding social media, branding, online payment processing and platforms, and general finance and accounting.

Neither my undergraduate nutrition and exercise science education nor my physical therapy education and professional experience prepared me to develop those skills. My vision and determination served me well. There are still areas of online marketing and business that I have yet to explore, some of which I may not know about, and some of which do not yet exist. Despite this, I am content with discomfort in those areas because I am confident in my ability to solve problems and know that I will never be done learning.

The second hardest part of my journey revolved around my own self-limiting expectations and beliefs. I have learned to unapologetically own my dreams and happiness. My mom owned her own law practice and I saw how hard she worked. Growing up, I never wanted to have my own business . . . until I did. I thought I was going to be a stay-at-home mom and work PRN homecare physical therapy. While I loved my time at home, it was not long before I recognized that being a full-time, stay-at-home mom was not for me. Because I always had that vision, there was a real cognitive dissonance, and mom-guilt, that I had to overcome as an entrepreneur. I had to accept the fact that just because I am not the stay-at-home mom I expected I would be, I am not a bad mom. I have learned to wholeheartedly embrace the notions of, "get comfortable with being uncomfortable" and "start before you're ready."

I'm fortunate to have the support of family and friends in my journey developing a business outside the box of traditional geriatric physical therapy. I have come to realize that it is okay to ask for help. Sometimes asking for help means as much to the person helping as it does to the person asking. I have leaned into my goals and let confidence develop along the way. Most importantly, I strive to "keep my eye on my why." I help women over 40 reduce insulin resistance for sustainable weight loss and disease prevention. My business, like a healthy weight and lifestyle, requires daily commitment and is a journey worth pursuing.

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Prescribing Exercise to Reduce Cancer-Related Fatigue: A Case Report

by David T. Cavagnino PT, DPT, MS

Cancer-Related Fatigue (CRF) is a term used to describe a symptom reported by 58% of patients who have been diagnosed with cancer. Prevalence is even higher for patients following radiation or chemotherapy at rates of 60-93% and 80-96%, respectively.[1] The literature on CRF contains varying definitions and attempts at establishing diagnostic criteria. Perhaps the most broadly defined and accepted is the definition of "a distressing, persistent subjective sense of physical, emotional, or cognitive tiredness (lethargy) related to cancer pathology and/or cancer treatment that is not proportional to recent physical activity and interferes with usual general functioning in ADLs".[1] Cancer related fatigue is the result of both "physiologic" and "situational" factors including physiological changes caused by the pathological tumor or treatment as well as anxiety and cumulative effects from vomiting and GI problems (anemia, pain, dehydration, and electrolyte imbalances).[2]

Research on CRF is relatively well established. A 2012 Cochrane Review found that supervised exercise interventions, aerobic exercise programs in particular, may significantly reduce CRF.[3] Exercise should be of moderate intensity, defined as 55-70% of maximum age-predicted HR or a rating of 11-13 ("light" to "somewhat hard") on the Borg RPE scale.[1] Frequency, however, is not as well agreed upon. One source recommends exercise 3-5 times per week.[1] Another merely recommends "an element of supervision."[4]

The purpose of this case report is to determine the impact of a daily home exercise program (HEP) with weekly visits by a PT for a person who refused more than 1 visit per week but expressed willingness to participate in an HEP. This situation presented the opportunity to support patient self-efficacy while making judicious use of healthcare resources and improving her functional performance.

Case Description

An 87-year-old female, Betty, was referred to skilled physical therapy to address functional decline in standing transfers and gait in both household and community ambulation. Retired and living alone, she has a neighbor who has been recently hired for assist with showers, meal preparation, and supervision of medication timing. A daughter lives nearby and provides shopping assist, her primary socialization.

Medical History

Betty underwent surgical removal of a malignant tumor in her colon 3 months prior to referral. Post-surgical recovery was complicated by development of anemia from stool blood loss. After the GI bleed was controlled, she recovered for 2 weeks in an inpatient rehabilitation facility and 4 weeks in a subacute rehab facility. One fall without injury was recorded while at the subacute facility. After returning home, Betty complained of trouble ambulating due to feeling "tired and weak." She refused to participate in more than 1 session of therapy per week but states that she will perform a home exercise program. Her current HEP involves seated heel raises, knee extensions, and marching. She performs these daily without change in her cardiovascular endurance.

Other pertinent history includes congestive heart failure (CHF) and hypertension, for which the Betty takes an angiotensin II receptor blocker and furosemide. Diabetes mellitus type 2 is managed with insulin. She takes a statin for high cholesterol and Synthroid to address low thyroid hormone levels. She is blind in the right eye from macular degeneration and glaucoma. Other surgery includes a distant cholecystectomy.

Prior Level of Function

Prior to the cancer hospitalization and surgery, Betty was independent with all transfers, but was a limited community ambulator with use of a rolling walker. Her stated goals are to feel safe ambulating in her home and to be able to return to shopping with her aide or daughter.

Physical Examination

Betty was oriented to person, place, and time at initial assessment despite noted limited vision in R eye. Sensation to light touch on lower extremities was intact and CHF appeared well controlled with no lower extremity edema noted. She does not complain of pain, only persistent fatigue. Considering Betty's history of CHF, anemia, and sedentary activity level, she required a combination of cardiovascular monitoring strategies including the Modified Borg Dyspnea Scale (MBDS), percentage of heart rate max, SpO2 percentage, and blood pressure response to exercise. Despite shortness of breath with moderate exercise and functional activities, her SpO2 remained above 97% during the initial evaluation session. She required minimal physical assistance to stand from a standard chair using the armrests; marked unsteadiness was noted

at top of stand. Walking distance with rolling walker was limited to 50 feet with "severe" breathlessness, measured as a 5/10 on the MBDS. Minimal assistance was required to prevent loss of balance when turning. Monitoring Betty's blood pressure response to activity, no indication to terminate exercise such as a significant drop in systolic blood pressure was observed.

Outcome Measures

Betty's static and ambulatory balance, functional performance, and fall risk were screened using a Timed Up and Go (TUG) and 4 Stage Balance Test, part of the CDC STEADI protocol, as well as the Chair Rise Test to establish lower extremity power. These balance screens were followed up with the Tinetti Balance Assessment Tool to establish situational balance impairments, such as turning or when perturbed. The Patient Specific Functional Scale (PSFS) recorded her ability to stand and reach out of base of support, stand to prepare a meal, and perform grocery shopping with her aide. Refer to Table 1 for initial and discharge scores on these measures.

Table 1. Outcome Measure Data

Outcome Measure	Initial Evaluation Score	Discharge Score
Timed Up and Go (TUG)	32.2 seconds	18.0 seconds
4 Stage Balance Test	Narrow Base: 12 seconds Semi-Tandem: 0 seconds Tandem Stance: 0 seconds	Narrow Base: 12 seconds Semi-Tandem: 10 seconds Tandem Stance: 0 seconds
Chair Rise Test	29 seconds (using arms)	16 seconds (using arms)
Tinetti Balance Assessment Tool	21/28	23/28
Patient Specific Functional Scale	1) Grocery shopping with aide: 2/10 2) Standing to reach into cabinet: 2/10 3) Preparing a cold meal for lunch: 3/10 Average: 2.3/10	1) Grocery shopping with aide: 8/10 2) Standing to reach into cabinet: 9/10 3) Preparing a cold meal for lunch: 7/10 Average: 8.0/10

Assessment

Betty would benefit from a multidimensional rehabilitation program including aerobic and gait training to address poor functional activity tolerance when walking short distances, functional and power training to reduce assistance with standing transfers, and balance retraining to address her observed instability. Scores for the TUG, Chair Rise Test, Tinetti, and Four Stage Balance Test indicated increased fall risk; specific vulnerabilities to falling were revealed when standing from sitting as well as turning while standing.

Goals for Betty included reducing her TUG score below the 30 second cutoff that indicates need for assistance with transfers while improving beyond minimal detectable change (MDC) of 2.5 seconds. Goal for Chair Rise Test was set at 22 seconds to improve towards age and sex norm of 12.7 seconds and achieve minimal clinically important difference (MCID) of 2.3 seconds; it is important to note that the patient's use of arm rests during testing limited validity of using norms to set goals.[5,6] Since working with Betty, a new study has established an MDC of 1 repetition for the Modified 30 Second Chair Rise Test, which incorporates use of arms when transferring to standing and would have been another appropriate testing choice.[7] Additionally, while the CDC lists tandem stance as a cutoff for decreased risk of falls, a more realistic goal was set to achieve semi-tandem when considering that Betty's prior level of function required a walker for mobility. Finally, a goal was set for 23/28 on the Tinetti Balance Assessment, the maximum score achievable while using an assistive device.

Functionally, and to mark cardiovascular improvement, Betty's independent ambulation with a rolling walker goal was set for 500 feet with only "slight" breathlessness, or a 2/10 on the MBDS, to achieve prior level of function (PLOF). Sit-to-stand transfer goal was also set for independence with use of arm rests, reflecting return to PLOF. These improvements reflected a PSFS score goal of 7/10. Considering the literature on CRF, it was expected that her dyspnea upon exertion and lethargy would significantly improve.

Intervention

As mentioned previously, ideal frequency supported by the literature is a minimum of 3 days per week.[1] Betty refused to participate to this degree. She was only willing to be seen once per week but agreed to perform a home exercise program daily with supervision and assistance from her aide.

Weekly Program with Therapist

1. In line with previously discussed recommendations, endurance exercises were performed to an RPE of "light" to "somewhat hard," or 2-4 on the 10-point Borg RPE scale. Progression was gradual, and the Betty's dyspnea warranted slower pacing with vital sign monitoring to ensure that heart rate remained within target range of 55-70% of maximum age-predicted HR and no oxygen desaturation occurred. In her deconditioned state, functional training provided an adequate aerobic challenge to improve cardiovascular endurance.

Gait training was performed for distance, starting from 50 feet, and attempting to extend that amount by 50 feet each week until Betty was able to achieve two trials of 200 feet or one trial of 350 feet. Her dyspnea decreased from 5/10 to 2/10 on the MBDS. Sit to stand transfers were performed for 2 sets of 5 at the initial encounter and progressed to 2 sets of 12 to improve muscular endurance to carry over to ambulation.

2. Muscle strengthening exercises were performed to target knee extensors, glutes, and hip abductors to address underlying deficits in transfers and standing balance. Exercises were limited in number to preserve energy for ambulation and functional training. Knee extension was progressed to achieve 2 sets of 12 with five pounds of resistance, while hip abduction exercises were progressed to 2 sets of 12 with a heavy resistance band. Again, sets of 12 were targeted to achieve a benefit to muscular endurance to carry over to ambulation and standing.

3. Balance exercises were performed to target specific situational deficits determined during evaluation. Turning in place with rolling walker was progressed to turning between sets of sidestepping and backwards walking which were similarly progressed to be performed with a cane. Narrow and semi-tandem balance training was performed, progressing to no upper extremity support, with unsuccessful attempts to incorporate closed eyes, due to her anxiety about falling. Random volitional stepping activity was performed with unilateral support to address endurance as well as improving stepping strategy for balance recovery after LOB.

Home Exercises

Betty expressed willingness to continue to perform the seated HEP exercises with which she was already familiar. Standing exercises with bilateral upper extremity support were suggested but she would not perform these without PT present due to fear of falling. However, she was willing and adhered to performing standing transfers and walking 50 – 100 feet hourly, which was consistent with primary goals for plan of care.

RESULTS

Outcome Measures

Data collected at discharge showed Betty reached her goal for the TUG, Chair Rise Test, and Four Stage Balance Test, as well as the Tinetti Balance Assessment Tool (see Table 1). She achieved her goal for independence with sit to stand transfers and made progress towards her ambulation goal. These improvements were reflected in achieving and surpassing the goal for PSFS.

Gait

She was able to improve her walking distance to 350 feet with "slight" dyspnea (2/10 on MBDS) independently with her rolling walker. This fell short of goal of 500 feet but was a significant improvement that allowed for return to limited community ambulation.

Transfers

Betty reached her goal of standing independently from chairs and toilet seats of varying heights around her home, using arm rests. Instability present at initial evaluation was not observed at discharge.

Home Exercise Program

Betty progressed to standing and walking hourly for up to 100 feet with her rolling walker by the time of discharge. She also performed sitting knee extensions, marching, and hip abduction throughout the day.

DISCUSSION

Betty ultimately participated in 9 supervised sessions over approximately ninety days. Improvements in both function and functional outcome measures were made; it is possible that greater improvements would have been seen with an increased frequency of skilled care. However, results of outcome measures indicate a reduced risk of falls, improved lower extremity strength and power, and carryover to improve functional performance. Betty demonstrated safe independent standing transfers, exceeding the goal for the Patient Specific Functional Scale. Functionally, she returned to preparing meals and joining her aide for short shopping trips. She was adherent to performing a daily walking program and performed sitting exercises daily.

There were several personal and environmental factors that required the adaptation of the plan of care. The first was the patient's slow recovery from anemic condition. While Betty reported no more blood in stool, her residual low hemoglobin count limited the usefulness of supplemental oxygen and pulse oximetry. Special attention was paid to achieving moderate aerobic challenge while monitoring heart rate and dyspnea.

Other personal factors included episodes of nausea, vomiting, and gastrointestinal distress that interfered with multiple treatment sessions. As a result of inconsistent ability to participate in therapy, Betty's regular performance of HEP and walking program became central to her plan of care, with supervised sessions as ancillary and important to modifying and updating activity to progress towards functional goals.

Finally, Betty demonstrated high levels of anxiety about her diagnosis during her recovery period. She reported "losing sleep" about whether the cancer was successfully removed during surgery and whether it would reoccur. Follow-up testing confirmed successful removal of the colon tumor. Pain that developed in her right shoulder during care was imaged and found to be a tumor—biopsy confirmed malignancy. Prior to this diagnosis, exercises involving upper extremities had been modified to be pain-free and priority shifted to lower extremity strengthening and balance. Following shoulder diagnosis, Betty was scheduled for radiation and decided to discontinue home physical therapy in anticipation of worsening pain and fatigue with radiation therapy.

Retrospectively, it would have been beneficial to include a more direct measurement of aerobic endurance, such as the 6 Minute Walk Test or the 2 Minute Step Test, instead of multiple outcome measures addressing balance, as well as a measure of actual cardiopulmonary effort.

CONCLUSION

This case report involves a person with both physiological and psychological factors related to diagnosis and treatment of a malignancy which contributed to CRF. Rather than present a narrative that is resolved neatly, this case demonstrates how a treatment plan may be effectively modified and continue to show positive results even when complications arise. This demonstrates that positive outcomes can be achieved with a multidimensional rehabilitation program incorporating appropriately dosed aerobic training with older adults with a cancer diagnosis. Supervision of exercise is an in important skilled aspect of care and that a patient who is willing to perform daily activity can improve their functional independence and their experience of CRF. Participation in this rehabilitation program following her initial surgery allowed Betty to start her next round of radiation with an improved functional reserve that the author hopes will minimize her experience of disability during the treatment, enhance her recovery, and allow her to continue to age in place.

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Get a Grip: Do Leg exercises Increase Arm strength?

by Michael Hyland PT, DPT

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

Falls are associated with high morbidity and mortality in the aging population. There are multiple risk factors associated with falls. Risk reduction strategies such as exercise have shown to be successful as a single or as part of a multifactorial intervention in community-dwelling populations for fall reduction.[1]

Previously published studies in falls prevention have demonstrated that The Otago Exercise Program (OEP) is an exercise program that can be implemented to improve lower limb weakness and balance. But is it an appropriate strategy to use for improving upper body strength as well? This Journal Club article raises a novel concept: that grip strength (and by inference upper extremity strength) is also improved or at least maintained by the 17 primarily lower extremity exercises of the OEP.

Subjective Examination

Karen is a 69 y/o female who self-referred to a home-based outpatient physical therapy agency when she recognized increasing job anxiety due to fear of falls. She reported falling 6-7 times in the last 2 years, sometimes with injuries. She reported occasional right knee buckling with loss of balance and difficulty with stairs. Personal trainer sessions at a local gym had been helpful for her but balance issues still resulted in much fear, especially when carrying objects while going up and down stairs. Frequent stair climbing while carrying a laptop, supply bag, and often other equipment was a necessary job requirement in her position as a home care nurse.

Past Medical History: GERD, depression, obesity, OA, breast cancer, lumpectomy in 2010, and R TKA in 2018. At the time of treatment, she was taking 4 prescription medications and a magnesium supplement.

Home environment and functional status: Karen resides alone in a ground level apartment and works 2 days per week as an RN in home care. She is sedentary when not working despite biweekly workouts with the personal trainer. Divorced with 2 grown children, one lives nearby. Other than occasional outings for coffee or lunch with friends she reports infrequent social activity. She is able to drive independently. Prior to therapy she would become short of breath with long distances of walking (more than a block). She stated that the step up into her apartment from garage had been such an issue that she had a bar installed so that she could hold on when coming in and out of the apartment. She avoided stairs unless she had no choice as her reported falls were associated with going up steps at patient homes.

Patient goals: Karen expressed her biggest goals were to stop falling and to walk in the community with more confidence.

Tiffany Schubert demonstrating one of the Otago exercises

Objective Examination at Initial Evaluation

Vital signs at Rest: BP 116/88 mmHg, HR 104 bpm, Temp 98.4 degrees F, RR 18 breaths/min

Lower body strength: 30 Second Chair Stand Test (30SCST) 10 reps

Functional Mobility: TUG 14 seconds. TUG with carrying object 20 seconds. Tested ablity to perform SLS to place foot on step stool and patient unable without at least one hand support.

Gait Speed: 2.36 feet/sec using 8-foot gait velocity test

Posture: Karen presented with moderate thoracic hyper-kyphosis and moderate left knee genu valgus

Balance: Four stage balance test results: able to hold feet together x10 seconds, instep position x10 seconds, tandem stance x10 seconds, and SLS of 3 seconds with LOB.

Sensory Integration of Balance: mCTSIB score was 98/120 with LOB on condition 4 and noted sway of trunk.

Assessment: Karen demonstrated impaired vestibular balance, slow walking speed, and inability to perform SLS resulting in fall risk. In addition, 30SCST of 10 repetitions indicates fall risk for a woman of her age and inadequate lower body strength to prevent falls. She has had multiple falls, some with injury, and is at high risk for falling again, despite working out with a trainer regularly. She is in need of physical therapist expertise in order to address specific causes of falling and will benefit from skilled PT plan of care.

Plan: Karen will receive outpatient therapy in her home including to implement Otago balance program 2 times per week for 5 weeks or total of ten visits to address impairments and to reach her personal goal(s) of no falls and more confidence to walk in the community.

Treatment Methods

The treatment regimen included the seated and standing strengthening exercises and balance exercises chosen for Karen as described in the Otago program manual. Warm up exercises were only completed on first treatment session. She completed seated strengthening exercises and standing strengthening exercises, as well as majority of the balance exercises found in the program on each visit. The seated exercises consisted of long-arc quad sets without and then with resistance that progressed over time. Sit-to-stand was a regular exercise in the POC. Standing exercises consisted of heel raises, toe

TABLE 1

	1st Treatment Session	10th Treatment Session	Final Treatment session (18th visit after POC extension)
Strengthening Exercises			
Long Arc Quad Sets	X	2 x20 reps with 2.5# weights	2x 20 reps with 3# weights
Hamstring Curls	10 reps hold support	20 reps hold support	20 reps NO support with 3# weights
Hip Abduction	10 reps hold support	20 reps hold support	20 reps NO support with 3# weights
Calf Raises	10 reps hold support	20 reps NO support	20 reps NO support with 3# weights
Toe Raises	10 reps hold support	20 reps hold support	
Balance Exercises			
Mini Squats	10 reps hold support	20 reps NO support	20 reps NO support
Backwards Walking	2x 10 steps hold support	Held due to HS cramps	2x 10 reps NO support
Heel Walking	2x 10 steps hold support	Held due to HS cramps	2x 10 reps NO support
Backward Walking	2x 10 steps hold support	Held due to HS cramps	2x 10 reps NO support
Tandem Walking	2x 10 steps hold support	Held due to HS cramps	2x 10 reps NO support
Single Leg Stance	2x 10 seconds hold support	Held due to HS cramps	8 seconds without UE support
Tandem Stance	2x 10 seconds NO support	Held due to HS cramps	X
Sit to Stand	2 x10 reps without UE support	1x 20 reps without UE support	1x 20 reps without UE support
Stairs	X	X	4 steps x5 reps with single UE support on handrail

raises, hamstring curls, hip abduction, and mini squats with resistance added over time. Balance exercises conducted consistently were tandem walking, backwards walking, sideways walking, toe walking, heel walking, tandem stance, and single leg stance. In addition, Karen was also trained on foam balance pad to address likely vestibular system deficits. Other seated and standing marching exercises, with resistance, were added due to her inability to lift lower extremities high enough to clear steps/stair risers. Table 1 shows the interventions from the OEP performed at first treatment session, exercises performed at tenth session, and then at discharge. Note the differences and the way these were progressed over time.

Results at D/C

Vital signs at Rest: BP 119/84 mmHg, HR 108 bpm, Temp 98.0 degrees F, RR 20 breaths/min

Lower body strength: 30 Second Chair Stand Test (30SCST) improved from 10 reps to 12 reps indicating improved lower body strength and reduced fall risk.

Functional Mobility: TUG reduced from 14 seconds to 12.6 seconds indicating reduction in fall risk. TUG while carrying object reduced from 20 seconds to 16 seconds. Pt able to place lower extremity on step stool without UE support, though still needing single hand support for stairs.

Gait Speed: Increase from 2.36 feet/sec to 2.64 feet/sec using 8-foot gait velocity test indicating improved confidence with gait and reduced fall risk, though still showing risk of falls in community vs home.

Posture: Karen presented with moderate thoracic hyper-kyphosis and moderate genu valgus of left knee that remained unchanged after therapy.

Balance: Four stage balance test results: feet together hold x10 seconds, instep position x10 seconds, tandem stance x10 seconds, and SLS of 8 seconds. Increase from 3 to 8 seconds on SLS is significant, though not a full 10 seconds as hoped for.

Sensory Integration of Balance: mCTSIB score increased from 98/120 to 120/120 indicating that vestibular balance was improved over baseline.

Assessment/Discussion

Karen had made objective improvements in all areas after the initial 10 visits, but had also developed hamstring cramping that was an issue for tolerating sessions and seemed to happen more after waking up in the morning. A plan of care was approved for an additional 8 visits. Through the total of her therapy sessions she was able to make objective gains in lower body strength, both static and dynamic balance, sensory integration of balance, and in walking speed. She was also able to negotiate stairs with reciprocal pattern, rather than a step-to pattern, reportedly for the first time in decades. Though her gains were not quite as large as hoped for they were definite and resulted in tremendous subjective improvement of self-confidence. Note the improvement in TUG while carrying objects from 20 seconds to 16 seconds, indicating that she was more confident and had improved balance while carrying objects in the arms. As of this writing she has not had a single fall since completing her therapy plan of care and continues to work with her trainer twice a week to keep as fit as possible. According to the research of Dr. Tiffany Shubert et al, regarding implementation of Otago in the USA, scores on 30 second chair rise, Timed Up and Go, and Four Stage Balance Test significantly improved.[2] Karen's case highlights the truth of this research and demonstrates the viability of delivering the Otago Exercise Program in the home under

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

We will discuss **The Modified Otago Exercises Prevent Grip Strength Deterioration Among Older Fallers in the Malaysian Falls Assessment and Intervention Trial (MyFAIT)**; *Journal of Geriatric Physical Therapy*: 2019 Jul/Sep;42(3):123-129

Case Study: **Get a Grip: Do Leg exercises Increase Arm strength?** By Michael Hyland, PT, DPT, CEEAA

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outpatient therapy benefits. In addition, this also shows that the results can be long lasting even months after the program has ended.

Can upper body strength, particularly grip strength, be improved or at least maintained by use of the OEP? For Karen, use of the upper body was crucial for doing the OEP exercises as she needed some upper body support for balance. She gripped the counter with 1 or both hands while performing exercises in therapy. Stair climbing was also performed while gripping a hand rail. In this sense her grip strength may have maintained or improved as was suggested in the article by Liew, et al.[1] Even though the OEP does not target upper extremity strength, it is conceivable that strength gains in the hands/wrist may occur. Ironically, fear of falling may actually result in a strong supportive grip when performing balance and strengthening exercises, thereby resulting in grip strength gains. As seen in Karen's case, use of the upper body to carry an object while performing an objective balance test such as the TUG may give clues as to how much the patient depends on upper body use for security during functional tasks. It may be valuable to incorporate greater use of upper body assessment and strength measures as part of a fall prevention program. For example, use of hand grip dynamometry as a baseline measure pre and post OEP, use of TUG and then comparing to TUG with carrying objects, and even including measures such as timed stair climbing if applicable to patient situation. These outcomes would be valuable for virtually any patient for whom falls are a concern. As with many areas, more research would be needed to see if these additions made a significant difference in both upper extremity strength and fall reduction over time. Regardless, it would definitely be a wise addition to future assessments to focus on the whole person and to present a more complete picture of their functional balance.

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Achieving Balance at Every Level

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

One of the most frequent questions we receive when teaching is "What can we do to work on balance with people functioning at a lower cognitive and performance level?" No matter what level our patients are at, general evidence guidelines apply.

A meta-analysis by Sherrington et al. examined the effect of exercise on the prevention of falls. The researchers found that the more hours of exercise, the better the outcome and that at least 50 hours is needed to achieve optimum results. In addition, programs should include a combination of interventions.[1]

In another meta-analysis, Stubbs et al. looked at what works best to prevent falls. They found that exercise and individually tailored multifactorial interventions were effective in reducing falls, that successful programs challenged balance, progressively minimized hand assist, and worked on controlling movement over the center of mass. Walking programs were not effective in improving balance.[2]

Another important guide about high intensity functional training for less able people comes from a recent study by Gustavson et.al. entitled *Application of High-Intensity Functional Resistance Training in a Skilled Nursing Facility: An Implementation Study*. The authors found that patients in i-STRONGER exhibited a 0.13 m/s greater change in gait speed than in the usual care group and a 0.64-point greater change in the Short Physical Performance Battery than usual care. The average SNF length of stay was 3.5 days shorter for patients in the i-STRONGER program. The program consisted of one-third of session time devoted to strengthening, one-third to functional transfer training, and one-third to neuromotor training, all performed at high intensity (i.e., to failure), 5 times per week for minutes determined by resource utilization groups (RUG).[3] The strength component used an 8RM model where the patient failed at 8 reps to all muscles of the lower extremity. The functional transfer training also worked on an aspect of training until fatigue. The tasks performed were bed mobility, sit to stand, floor transfers, and a bridging progression. Neuromuscular training was also performed to fatigue at 8 reps for tasks such as multi-directional stepping, step up, dynamic floor progressions, multi-directional lunging and stepping patterns.

A less intense program that also showed improvement of balance in lower level patients was short stick exercises (4). This program decreased falls and significantly improved scores on the sit and reach and functional reach tests. This program was performed in sitting twice a week for 6 months. The stick was a rolled-up newspaper 21 inches in length and 1 inch in diameter with red adhesive tape on both ends. Each session lasted 25 minutes and is a progression of stick movement that requires the participant to watch the stick with their eyes. Here are a few of the movements: Throw the stick up and catch it with one hand, throw stick with both hands, spin the stick, and balance the stick. More activities are listed in this article.

The last suggestion comes from a study done in 2020 by Luis Espejo-Antu´nez et al, entitled *The Effect of Proprioceptive Exercises on Balance and Physical Function in Institutionalized Older Adults: A Randomized Controlled Trial.* This study demonstrated significant improvements compared with the control group in areas such as functional mobility, musculoskeletal endurance, balance, gait, and risk of falls in institutionalized older adults. The protocol was performed twice a week for 12 weeks and each treatment was 55 minutes in duration. Exercise sessions had 3 phases: 15 minutes of warm-up with slow walking, mobility, and stretching exercises, followed by a 30-minute proprioceptive exercise program, and then10 minutes to cool down using muscle stretches and relaxation exercises. Pictures of the proprioceptive exercises are illustrated; the supplement describes them in detail. Exercises featured are single leg stands with leg movements, toe/ heel raises, tandem stands and walks, sideways walking, external perturbation all directions, standing behind a chair and leaning hips into the chair, holding a ball outstretched in front and moving it side to side and up and down. All exercises require following the movement with eyes. Once 10 repetitions can be performed successfully, hand support is decreased. Eventually these are to be done with eyes closed.

There is so much that can be done to help patients improve balance at all initial levels of function. The GetLIT column in the January 2021 issue gave you some ideas for appropriate evaluation tools; this article suggests just a few of the many ways to improve balance in an evidence-based fashion for people who may be demonstrating a low level of physical function.

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