

# GERI NOTES

Academy of Geriatric Physical Therapy

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## IN HONOR/MEMORIAM FUND

Each of us, as we pass through life, is supported, assisted and nurtured by others. There is no better way to make a lasting tribute to these individuals than by making a memorial or honorary contribution in the individual's name. The Academy of Geriatric Physical Therapy has established such a fund which supports geriatric research. Send contributions to:

**The Academy of Geriatric Physical Therapy | 3510 East Washington Avenue | Madison, WI 53704**

Also, when sending a contribution, please include the individual's name and any other person you would like notified about your contribution. If you are honoring someone, a letter will be sent to that person, and if you are memorializing someone, the surviving family will be notified of your contribution.

In the field of geriatric physical therapy, we receive many rewards from our patients, associates, and our mentors. A commemorative gift to the Academy of Geriatric Physical Therapy In Honor/Memorial Fund is a wonderful expressive memorial.

# PRESIDENT'S MESSAGE: HOW OLD DO YOU FEEL YOU ARE?

William H. Staples, PT, DHS, DPT, GCS, CEEAA



How old do you feel? What answer would you give to this question? Is it the same as your chronological age? Is it 5 years or 10 years younger? Or is it possibly older than your calendar age? On the eve of my 60th birthday, I am compelled to ponder these questions. Do I feel 60? Exactly how am I supposed to feel at 60? I can only experience myself and I cannot step into someone else's body or mind. I know I try to exercise every day, eat right, and get enough sleep. That being said, I know that my body has collected a couple of orthopedic ailments recently that have caused me to "retire" from competitive soccer last year and rethink my age.

A great deal of research in psychosocial gerontology now exists that examines how people maintain or change their self-concepts as they age. But the concept of the aging self, or one's personal sense of growing older, is relatively new.<sup>1</sup> According to a study by Westerhof et al, for most people who are in their 70s, the average age reported is 15 years younger than the chronological one.<sup>2</sup> For example, a typical 75-year-old, will answer 60. Younger people usually respond closer to their age, so at 25 most people answer 25, but the gap widens over time. There is no clear explanation as to why this difference occurs, but as the aging research indicates, people who do feel younger than their years, actually do feel healthier and even do live longer! It may be that a 25-year-old has reached recent milestones of becoming an adult in society's eyes or that they have recently completed their education and are not concerned with the aging process at this time in their lives. An older person

in good health may see peers not aging well and use them for comparison. This may be the same bias that many health care workers view older adults, because they work with that population that is not aging well.

The Westerhof study compared people living in the United States and in the Netherlands, both on their feelings of their own age, and their self-esteem. Psychology students in both countries interviewed people they knew (a sample of convenience, which may have some bias), between the ages of 40 and 85, about these issues.<sup>2</sup> The researchers were curious about what differences would be found between the two samples, based on the differences in the "welfare systems" in each nation. According to the authors, the United States is classified as a liberal country, and demands more individual decision-making on the part of its citizens with regard to retirement and savings for this period of life. In the Netherlands, which is a social-democracy, the age of retirement is required at 65, and the financial security of older people is guaranteed by the state. As the results showed, in both cultures the gap between chronological age and the age one feels, widens as one grows older. Further, the greater the gap, the higher one's self-esteem. However, the authors found a stronger relationship between the self-enhancing functions of a youthful age identity in the United States where being "young" helps one thrive in a competitive, capitalist system than in the Netherlands. The researchers also speculate that being youthful is related to the type of welfare system each country has and the clear-cut designation of "retiree" in the Netherlands.<sup>2</sup> In the United States, many people continue to work into their 70s or longer, but not in the Netherlands. The United States has a youth-driven culture. Just watch television for the ads. On the com-

mercials older adults are only used in the ads for incontinence care or various medications. If you are relatively healthy and do not use those products, you cannot possibly be old. That seems logical. For the Dutch, it is difficult to lie about one's age, even to oneself because of the set retirement. If we in America feel as if we are 10 or 15 years younger than the birthday calendar says, it is not an unusual pathological quirk. So in the United States, it is not only normal to think you are younger than your actual years, it is a sign of positive aging. OK, I am better now, I only feel 50!

## REFERENCES

1. Diehl M, Wahl H. Awareness of age-related change: Examination of a (mostly) unexplored concept. *J Gerontol B Psychol Sci Soc Sci.* 2010;65:340-350. doi:10.1093/geronb/gbp110.
2. Westerhof GJ, Whitbourne SK, Freeman GP. The aging self in a cultural context: the relation of conceptions of aging to identity processes and self-esteem in the United States and the Netherlands by. *J Gerontol B Psychol Sci Soc Sci.* 2012;67:52-60.

# EDITOR'S MESSAGE: HELP OTHERS TO ENJOY THE WINTER SAFELY

*Meri Goehring, PT, PhD, GCS*



Physical therapists provide a wealth of information to patients. At this time of year, it is important to remember that older adults may need to be re-

minded about the dangers of winter weather. Here are a few tips that you can share.

## **DRIVING SAFETY**

First, when driving, remind your patients that cars often break down unexpectedly. Remind your patients to get their vehicle winterized. Also, it is a good idea to ask your patients if they have stocked their cars with basic emergency supplies. These include a first aid kit, blankets, extra warm clothing including socks and gloves, jumper cables, a long windshield scraper with a brush, a shovel, rock salt, a bag of sand or cat litter to pour on ice or snow if the wheels get stuck, a container of water and canned or dried foods that open easily, and a flashlight with extra batteries.

## **FALL PREVENTION**

Physical therapists are experts at helping our patients avoid falls. But, do we remind our patients that anyone can fall on ice and snow? Most of our patients know to stay on shoveled steps and walkways. But, these cannot always be avoided. Wearing boots with non-skid soles help, but carrying a small, zip-lock baggie of cat litter to spread over an icy walk way is another tip that might help someone avoid a fall. Additionally, for those individuals who live where winters are long and walking on ice and snow is unavoidable, there are devices that can strap to the shoes that help provide traction (Yaktracs and ICEtrekkers are a couple of brands that

are easily available). These may be difficult for some older adults to apply, so I recommend patients keep them on a specific pair of boots or shoes and leave these by the door so that they do not need to be removed.

## **DEHYDRATION AND HYPOTHERMIA**

Older adults tend to get dehydrated more quickly in winter, and there are lots of health problems associated with dehydration. Dry skin is common as are problems with constipation and/or bladder problems. Remind your patients to drink more water and to use a skin moisturizer. Also, the risk of hypothermia should be explained to patients. Older adults do not produce as much body heat. When the temperature is low, it is very dangerous for them to be out in the cold for too long as they begin to lose heat very quickly. Being out in the cold wind is even worse since the wind chill can be severe. Tell your patients that shivering and cold skin that is paly or ashy are signs of hypothermia. Also, if they feel weak, tired, confused, or sleepy while in cold temperatures, they may have hypothermia. They should not wait until they begin to shiver to go inside and get warmer since this may not occur in all older adults. Tell your patients to stay dry as wet clothing can cause the body to chill very quickly. Remind your patients that they can always call 911 if they feel they are suffering from hypothermia.

## **FROSTBITE**

Frostbite can occur more easily when the circulation is compromised. Many older adults have circulatory problems and need to be informed to protect themselves from frostbite. Frostbite usually affects the nose, ears, cheeks, chin, fingers, and toes. Therefore, it is important that our patients cover these areas of the body when in the extreme

cold. If the skin turns red or dark or gets painful, it is important to get out of the cold.

## **FIRE AND CARBON MONOXIDE**

It is important to remind patients that fires and carbon monoxide poisoning are also dangerous. Have fireplaces cleaned and have chimneys and flues inspected on a regular basis. The local fire department can recommend an inspector if needed. Also, any fireplace, wood, or gas stove needs proper ventilation. Remind patients to use smoke detectors and make sure the batteries are working. Also, a carbon monoxide detector should be placed in areas where fireplaces, wood stoves, or kerosene heaters are used. Make sure that your patients have a fire extinguisher in their homes and that it is in good working condition. Space heaters are dangerous, but if they are used, make sure they are at least 3 feet away from anything that might catch fire.

## **STAYING ACTIVE**

Finally, encourage older adults to stay active. Winter weather may discourage some from participating in their regular exercise routine if they are accustomed to outdoor exercise. Assist them in finding a way to keep active in the winter so that they remain fit and can more easily avoid health problems associated with deconditioning.

# PRACTICE COMMITTEE UPDATE

Chair, Greg Hartley, PT, DPT, GCS, CEEAA

The Practice Committee of the Academy of Geriatric Physical Therapy (AGPT) continues to work on many AGPT strategic goals, including the creation of evidence-based documents like clinical practice guidelines. Members have hopefully already seen the first Clinical Guidance Statement in *Physical Therapy (PTJ)*, the journal of the APTA. The full citation is:

Avin KG, Hanke TA, Kirk-Sanchez N, et al. Management of falls in community-dwelling older adults: clinical guidance statement from the Academy of Geriatric Physical Therapy of the American Physical Therapy Association. *Phys Ther.* 2015;95(6):815-834.

GeriEDGE is a group within the Practice Committee whose role is to evaluate the usefulness of tests and measures, specifically outcome measures. The GeriEDGE group has recently completed a manuscript entitled, "Determining Risk of Future Falls in Community Dwelling Older Adults: a Systematic Review and Meta-analysis Using Posttest Probability." Look for this in print very soon.

Additionally, members of the Practice Committee Clinical Practice Guideline Editorial Panel are deep in the work of creating 3 additional clinical practice guidelines (CPGs). The first of those will be specific to *physical therapy management (including intervention)* of patients who fall. The second is a joint venture with the Orthopaedic Section and will be on physical therapy management of patients with hip fracture. The Academy's third CPG, just getting under development, will be on physical therapy management of patients with osteoporosis.

The Practice Committee is involved in much more than the creation of CPGs. The following initiatives and updates come from the APTA Practice

Department. The AGPT and Practice Committee members work closely with APTA on many of these initiatives. If you have any questions, please visit the links listed under each heading.

## 1. PHYSICIAN QUALITY REPORTING SYSTEM (PQRS) UPDATE

- APTA is aware that there has been some issues with letters related to 2014 reporting performance. Staff has been and will continue to work with CMS and "QualityNet" on identified issues.
- 2016 PQRS updates and resources for physical therapy have been released and detailed information is available on APTA's website.
- More information related to PQRS, please visit APTA's website at <http://www.apta.org/PQRS/>.

## 2. SCOPE OF PRACTICE

- The Physical Therapist Scope of Practice (<http://www.apta.org/ScopeOfPractice/>) takes into account 3 areas:
  1. Professional Scope of Physical Therapist Practice
  2. Jurisdictional (Legal) Scope of Physical Therapist Practice
  3. Personal Scope of Physical Therapist Practice
- APTA's Board of Directors voted to forward the following motion to 2016 House of Delegates.

### DEFINITION OF PROFESSIONAL SCOPE OF PRACTICE

The professional scope of physical therapist practice, based upon a distinct body of knowledge of the human movement system, is the examination of, evaluation of, diagnosis of, prognosis of, and interventions for individuals, and engagement with communities and populations, to optimize health. This scope is grounded in contemporary educa-

tion, best available evidence, and ethical conduct. Dynamic in nature, it is responsive to innovation and collaboration, thereby transforming practice, policy, and society.

### GUIDING PRINCIPLES:

Professional scope of physical therapist practice:

- is supported by education and evidence,
- encompasses jurisdictional and personal scopes of practice,
- is broad enough to stimulate or allow for innovation,
- encompasses interprofessional collaboration,
- is open to innovative or evolving models of care and/or service delivery throughout the lifespan,
- is patient or client-centric,
- should not be a list of activities,
- overlaps with some components of other health professions' scope of practice,
- is grounded in the Human Movement System (HMS),
- is dynamic & responsive to changes in the literature and societal needs,
- shapes the future of practice and policy (eg, professional, legislative, regulatory, health, environmental, administrative),
- is consistent with the International Classification of Functioning, Disability, and Health (ICF) <http://www.who.int/classifications/icf/en/>,
- is consistent with the Guide to Physical Therapist Practice 3.0 definition of management (<http://www.apta.org/Guide/>), and
- is consistent with the Code of Ethics for the Physical Therapist ([http://www.apta.org/uploadedFiles/APTAorg/About\\_Us/Policies/Ethics/CodeofEthics.pdf](http://www.apta.org/uploadedFiles/APTAorg/About_Us/Policies/Ethics/CodeofEthics.pdf)) and Standards of Practice for Physical Therapy ([GeriNotes, Vol. 23, No. 2 2016](http://</a></li></ul></div><div data-bbox=)

[www.apta.org/uploadedFiles/APTAorg/About\\_Us/Policies/Practice/StandardsPractice.pdf](http://www.apta.org/uploadedFiles/APTAorg/About_Us/Policies/Practice/StandardsPractice.pdf)).

(Board Meeting SS): The draft definition and guiding principles were provided to APTA members for comment in a survey format on the APTA Scope of Practice web site page from 8/25/15 through 9/11/15. Fifty-two responses were received—30 of the respondents indicated agreement with the definition; 21 did not agree with the definition; 1 abstained. The comments were reviewed, discussed, and the Scope of Practice Task Force (Task Force) determined that no changes to the definition were necessary. However, the Task Force did modify the guiding principles based on the feedback received. It will be important to have a strong support statement for the House of Delegates to explain the thought processes and rationale for some of the key works in the definition. Additionally, it was clear from many of the member comments, that there is a lack of understanding of the movement system.

To follow the House of Delegates discussion on the proposed motion, visit the HUB at <http://communities.apta.org/p/fo/st/thread=2385>.

### 3. HUMAN MOVEMENT SYSTEM

- After APTA's House of Delegates adopted a new vision statement for the physical therapy profession (<http://www.apta.org/Vision/>), the association's Board of Directors recognized that in order for the physical therapy profession to achieve the vision as articulated by its guiding principles, it would be necessary to integrate consistent application of the "movement system" (as mentioned in the guiding principle on "Identity") in physical therapist practice, education, and research.
- The human movement system comprises the anatomic structures and physiologic functions that interact to move the body or its component parts.
- Human movement is a complex behavior within a specific context.
  - Physical therapists provide a unique perspective on purposeful, precise, and efficient movement

across the lifespan based upon the synthesis of their distinctive knowledge of the movement system and expertise in mobility and locomotion.

- Physical therapists examine and evaluate the movement system (including diagnosis and prognosis) to provide a customized and integrated plan of care to achieve the individual's goal-directed outcomes.
  - Physical therapists maximize an individual's ability to engage with and respond to his or her environment using movement-related interventions to optimize functional capacity and performance.
- For more information, please visit APTA's website, the Human Movement System at <http://www.apta.org/MovementSystem/>.

### 4. PHYSICAL THERAPY CLASSIFICATION AND PAYMENT SYSTEM

- Changes have been made to the evaluation codes based on the pilot study results prior to presenting the codes to the CPT Editorial Panel. The CPT Editorial Panel agreed with the recommended evaluation codes and they were sent to the AMA Relative Value Scale Update Committee (RUC) Health Care Professional Advisory Committee (HCPAC). The recommendations were accepted. The AMA RUC HCPAC will make recommendations for the values to CMS. CMS will ultimately decide the final values.
  - The new evaluation codes split the currently used evaluation code into 3 levels based on the severity of the patient's condition and the intensity/complexity of the services provided.
  - There will be one re-evaluation code.
  - The new evaluation codes include the following components:
    - history,
    - examination,
    - presentation,
    - clinical decision making, and
    - development of plan of care.

CMS will release the proposed values for the evaluation codes in the proposed Physician Fee Schedule, July of 2016.

- The PM&R Workgroup continues work on the intervention codes, with the goal of developing a proposal that advances a patient management framework. APTA plans to re-test any proposal developed by the PM&R workgroup.
- For more information, please visit APTA's website, <http://www.apta.org/PTCPS/>, or contact Carmen Elliott, [carmenelliott@apta.org](mailto:carmenelliott@apta.org).

### 5. PTNow

- PTNow is APTA's web-based evidence-informed portal (<http://www.ptnow.org/>).
- PTNow offers a myriad of tools to assist physical therapists to identify, access, understand, and apply evidence to practice. It includes:
  - tests & Measures,
  - database search,
  - clinical cases,
  - clinical summaries,
  - Cochrane reviews, and
  - clinical practice guidelines.
- APTA will use the Sections to provide clinical expertise to the development of additional resources.
- For questions, please contact Anne Reicherter, PT, DPT, PhD, OCS, at [annereicherter@apta.org](mailto:annereicherter@apta.org).

### 6. UTILIZATION MANAGEMENT

- APTA is aware that private payers are exploring ways to cut health care costs and reduce utilization. As a result, APTA has noticed an increased use of third-party administrators (TPAs) to perform utilization management (UM) and utilization review (UR) of the physical therapy services.
- Below is a list of known Utilization Management market penetration thus far:
  - in the Northwest: Regence BC/BS contracts with eviCore in WA, OR, UT, and ID (implemented early 2014);
  - in the West: Cigna contracts with ASH (American Specialty Health) in CA, TX, AZ, and NV (implemented in summer 2014/early 2015);

- widespread: Anthem contracts with Orthonet in CA, CO, KY, IN, MO, NV, OH, and WI (implemented fall 2015 with CA on a pending status); and
- in the East: ASH (American Specialty Health) contracts with Cigna in CT, NH, and NY (2015/2016)-probably other states, waiting for clarification.

- APTA is developing a Utilization Management database to track activities. The database is expected to be released in the first quarter of 2016.
- For more information on Utilization Management please visit APTA's website at <http://www.apta.org/Payment/PrivateInsurance/TPAUtilizationMgmtReview/> or contact Elise Latawicz, [eliselatawicz@apta.org](mailto:eliselatawicz@apta.org).

## 7. STANDING SYSTEMS AND GAIT TRAINERS

- UnitedHealth Care (UHC) asked the APTA to review and comment on the draft of their medical policy for Standing Systems. The APTA staff assembled subject matter experts to present comments to UHC in July of 2015. The final policy was released on December 1, 2015.
- The updated policy reflects a complete reversal of the definition for medical necessity for the use of stationary, mobile, active standing systems, and gait trainers. The previous policy did not consider these items medically necessary. The updated policy still considers some

key accessories as convenience items however. The decision to cover these systems in general is major progress towards being able to provide this population of patients with as many tools necessary to maximize their function.

- The Policy can be found at UnitedHealth Care's website. ([https://www.unitedhealthcareonline.com/ccmcontent/ProviderII/UHC/en-US/Assets/ProviderStaticFiles/ProviderStaticFilesPdf/Tools%20and%20Resources/Policies%20and%20Protocols/Medical%20Policies/Medical%20Policies/Standing\\_Systems.pdf](https://www.unitedhealthcareonline.com/ccmcontent/ProviderII/UHC/en-US/Assets/ProviderStaticFiles/ProviderStaticFilesPdf/Tools%20and%20Resources/Policies%20and%20Protocols/Medical%20Policies/Medical%20Policies/Standing_Systems.pdf)).

## 8. IMPLEMENTING ICD-10 IN THE CLINIC

- APTA has received many questions related to ICD-10 implementation. Below is a list of the most common questions asked.
  - Do I use a seventh character for all ICD-10 codes? NO
  - Do the codes that are used for physical therapy services have to match the referral source? NO; however the same codes may be included on the claim if the code best describes the treating diagnosis.
  - Should I use the general equivalence mappings (GEM) to determine the ICD-10 code to use? NO

More details to this questions and many more can be found by APTA's website <http://www.apta.org/icd10/>.

- The Cooperating Parties met and discussed "First listed diagnosis" at their November meeting. They have not offered a statement on this topic. Once APTA has definitive responses, details will be posted on APTA's website and disseminated broadly. For more information on this topic please see "A note about the First-listed diagnosis" on the Identifying the Correct Codes for ICD-10 (ICD-10-CM) webpage. (<http://www.apta.org/ICD10/IdentifyingCodes/>).
- To ask questions and share experiences with colleagues, visit The Hub, APTA's online communities. ICD-10 Discussion Forum (<http://communities.apta.org/p/fo/sc/ca-tid=197>).
- If you have had issues with denials for payment of claims regarding ICD-10 coding, please use APTA's online form as the starting point to gain assistance and/or guidance from APTA staff. The Online Complaint Form can be found here: <http://www.apta.org/ICD10/ComplaintForm/>.



Greg Hartley, Chair of the AGPT Practice Committee is an Assistant Professor at the University of Miami, Miller School of Medicine, Department of Physical Therapy in Coral Gables, FL.

# EVALUATION AND TREATMENT OF BENIGN PAROXYSMAL POSITIONAL VERTIGO

Bonni Kinne, PT, DHS

Benign paroxysmal positional vertigo (BPPV) is a common vestibular disorder that occurs when otoconia break loose from the utricle of the inner ear and migrate into one of the semicircular canals (Figure). Canalolithiasis is a condition in which the otoconia remain free floating in the semicircular canal, and cupulolithiasis is a condition in which the otoconia become adhered to the cupula. Benign paroxysmal positional vertigo most frequently affects the older adult population because the mean age of onset is approximately 50.<sup>1,2</sup> Froehling et al<sup>1</sup> reported that throughout each decade of life, the overall incidence of BPPV increases. In addition, Von-Brevern et al<sup>2</sup> reported that by the age of 80, the cumulative incidence of BPPV is nearly 10%. The purpose of this article is to present an overview on how to effectively evaluate and treat patients who have been diagnosed with BPPV.

## EVALUATION OF BENIGN PAROXYSMAL POSITIONAL VERTIGO

The Dix-Hallpike test<sup>3</sup> is the best tool for evaluating the posterior semicircular canal. This test is performed as follows: (1) the patient long sits on a treatment table with the head rotated to the right, then (2) the therapist quickly moves the patient into a supine position with the head slightly extended off the end of the treatment table, then (3) the patient long sits on a treatment table with the head rotated to the left, and finally (4) the therapist quickly moves the patient into a supine position with the head slightly extended off the end of the treatment table. If the patient has right-sided posterior canal BPPV, the therapist will notice upbeating right torsional nystagmus at the end of step 2. If the patient has left-sided posterior canal BPPV, the therapist will notice upbeating left torsional nystagmus at the end of step 4. The torsional component of the nystagmus is generally more pronounced than the upbeating

component. Canalolithiasis of the posterior semicircular canal is characterized by a relatively short duration of the nystagmus, and cupulolithiasis of the posterior semicircular canal is characterized by a relatively long duration of the nystagmus.

The head roll test<sup>4</sup> is the best tool for evaluating the lateral semicircular canal. This test is performed as follows: (1) the patient lies supine with the head in a flexed position, then (2) the therapist quickly rotates the patient's head to the right, and then (3) the therapist quickly rotates the patient's head to the left. If the patient has lateral canal BPPV, the therapist will notice horizontal nystagmus at the end of steps 2 and 3. If the patient has canalolithiasis of the right lateral semicircular canal (and the otoconia have only traveled a short distance into the canal), the nystagmus will be right beating and more prominent when the patient's head is rotated to the right and left beating as well as less prominent when the patient's head is rotated to the left. If the patient has canalolithiasis of the left lateral semicircular canal (and the otoconia have only

traveled a short distance into the canal), the nystagmus will be left beating and more prominent when the patient's head is rotated to the left and right beating as well as less prominent when the patient's head is rotated to the right. Each of these two cases is characterized by geotropic (toward the ground) nystagmus. If the patient has canalolithiasis of the right lateral semicircular canal (and the otoconia have traveled a long distance into the canal) or if the patient has cupulolithiasis of the right lateral semicircular canal, the nystagmus will be left beating and less prominent when the patient's head is rotated to the right and right beating as well as more prominent when the patient's head is rotated to the left. If the patient has canalolithiasis of the left lateral semicircular canal (and the otoconia have traveled a long distance into the canal) or if the patient has cupulolithiasis of the left lateral semicircular canal, the nystagmus will be right beating and less prominent when the patient's head is rotated to the left and left beating as well as more prominent when the patient's head is rotated to the right. Each of these two cases is characterized by apogeotropic (away from the ground) nystagmus.

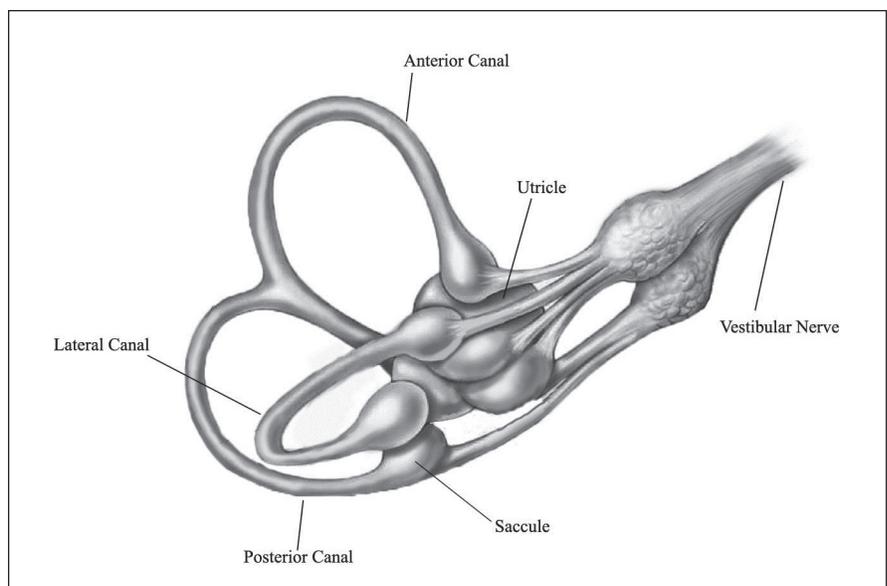


Figure. Semicircular canals of the inner ear. Image designed by Tess Tobolic.

The head hanging test<sup>5</sup> is the best tool for evaluating the anterior semicircular canal. This test is performed as follows: (1) the patient long sits on a treatment table with the head in a neutral position and then (2) the therapist quickly moves the patient into a supine position with the head completely extended off the end of the treatment table. If the patient has right-sided anterior canal BPPV, the therapist will notice downbeating right torsional nystagmus. If the patient has left-sided anterior canal BPPV, the therapist will notice downbeating left torsional nystagmus. The downbeating component of the nystagmus is generally more pronounced than the torsional component. Canalolithiasis of the anterior semicircular canal is characterized by a relatively short duration of the nystagmus, and cupulolithiasis of the anterior semicircular canal is characterized by a relatively long duration of the nystagmus.

### TREATMENT OF BENIGN PAROXYSMAL POSITIONAL VERTIGO

Canalolithiasis of the posterior semicircular canal is most commonly treated by the Epley maneuver.<sup>6</sup> If the patient has right-sided posterior canal BPPV, this maneuver is performed as follows: (1) the patient long sits on a treatment table with the head rotated to the right, then (2) the therapist quickly moves the patient into a supine position with the head slightly extended off the end of the treatment table, then (3) the therapist quickly rotates the patient's head to the left, then (4) the therapist quickly moves the patient into a left side-lying position, then (5) the therapist quickly moves the patient into a seated position, and finally (6) the therapist quickly moves the patient's head into a chin-to-chest position. Each position is maintained until the elicited nystagmus has subsided, and the entire sequence is repeated until nystagmus is no longer elicited. Cupulolithiasis of the posterior semicircular canal is most commonly treated by the Semont maneuver.<sup>7</sup> If the patient has right-sided posterior canal BPPV, this maneuver is performed as follows: (1) the patient sits on a treatment table with the head rotated to the left, then (2) the therapist quickly moves the patient into a right side-lying position, then (3) after 2 to 3 minutes have

elapsed, the therapist quickly moves the patient into a left side-lying position, and then (4) after 5 minutes have elapsed, the therapist carefully moves the patient into a seated position.

If the patient demonstrates geotropic nystagmus during the head roll test, the therapist should use the Gufoni maneuver<sup>8</sup> or the 270° roll technique<sup>9</sup> because these two interventions were found to be extremely effective in a 2012 systematic review.<sup>10</sup> The Gufoni maneuver for right-sided lateral canal BPPV is performed as follows: (1) the patient sits on a treatment table with the head in a neutral position, then (2) the therapist quickly moves the patient into a left side-lying position, then (3) the therapist quickly rotates the patient's head to the left, and then (4) after 2 to 3 minutes have elapsed, the therapist carefully moves the patient into a seated position. The 270° roll technique for right-sided lateral canal BPPV is performed as follows: (1) the patient lies supine with the head in a neutral position, then (2) the therapist quickly moves the patient into a left side-lying position, then (3) after 30 seconds have elapsed, the therapist quickly moves the patient into a prone position, then (4) after 30 seconds have elapsed, the therapist quickly moves the patient into a right side-lying position, and finally (5) after 30 seconds have elapsed, the therapist carefully moves the patient into a seated position. If the patient demonstrates apogeotropic nystagmus during the head roll test, the therapist should use the modified Semont maneuver<sup>11</sup> or the head shaking technique<sup>12</sup> because these two interventions were found to be somewhat effective in a 2012 systematic review.<sup>10</sup> The modified Semont maneuver for right-sided lateral canal BPPV is performed as follows: (1) the patient sits on a treatment table with the head in a neutral position, then (2) the therapist quickly moves the patient into a right side-lying position, then (3) the therapist quickly rotates the patient's head to the right, and then (4) after 2 to 3 minutes have elapsed, the therapist carefully moves the patient into a seated position. The head shaking technique for right-sided (or left-sided) lateral canal BPPV is performed as follows: (1) the patient sits on a treatment table with the head in a flexed position, then (2) the therapist quickly rotates the patient's head back and forth for 15 seconds, and then (3) the patient remains seated on

the treatment table with the head in a flexed position for approximately 30 minutes.

Anterior canal BPPV is often treated with posterior canal BPPV interventions (or "reverse" posterior canal BPPV interventions). However, a 2014 systematic review<sup>13</sup> highlighted the effectiveness of 4 interventions that had been specifically developed for anterior canal BPPV.<sup>14-17</sup>

### CONCLUSION

Therapists who provide services to the older adult population should possess at least a basic understanding of BPPV. This article presented an overview on how to effectively evaluate and treat patients who have been diagnosed with this particular diagnosis. In order to learn more about vestibular disorders, such as BPPV, you should consider taking a vestibular rehabilitation continuing education course as well as reviewing the related peer-reviewed literature.

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# MODIFIED DEVICE FOR TRAINING SIT-TO-STAND CAPACITY

Evan Prost, PT, DPT, GCS, CEEAA

In the home health and wellness setting a low cost, transportable method for easily and precisely adjusting the seat height for sit-to-stand training is needed. Lower extremity strength is associated with functional capacity<sup>1</sup> and with fall history.<sup>2</sup> Leg strengthening in the weight-bearing position can achieve higher gains compared to nonweight-bearing leg strengthening.<sup>3</sup>

Older adults with decreased leg strength or power may have difficulty rising from a chair of average height (17 in, 43 cm) even when using their arms to assist. In the clinic setting, an electric high-low plinth or mat can easily be adjusted to a higher sitting level so that the person is able to achieve multiple repetitions of sit-to-stand and train at an appropriate intensity. However outside the clinic setting, eg, in the home health or wellness setting, the therapist would need to resort to using couch cushions or stiff foam pads to boost the effective chair height for sit-to-stand training. It can be challenging to find materials that are of sufficient firmness to provide a solid seating surface for sit-to-stand training.

I built a simple adjustable height device that is suitable for training sit-to-stand strength in the home health or wellness setting, where a high-low plinth is not available. The cost was about \$20. I bought a used 3-in-1 commode at a yard sale, removed the toilet component so that only the adjustable height legs, frame, and arms remained (Figure 1). I then attached a firm, vinyl chair seat that screwed into the commode frame (Figure 2). The commode has low rails that can serve as chair arms, though they are an inch or two lower than a typical seat to arm distance. The patient may or may not use the arms, depending on the goal of the intervention. The seat height easily adjusts (similar to an aluminum walker or a cane) in one inch increments from a maximum seat height of 23 inch-



Figure 1.



Figure 2.

es (58.4 cm) to the lowest height of 17 inches (43 cm). Seventeen inches is the standard height for 3 standardized functional tests: Timed Up and Go, 30-second Chair Stand Test, and 5 Times Sit-to-Stand Test. The precision of the floor to seat height measurement supports the reliable performance of these standardized examination instruments, as well as boosting the objectivity of exercise program documentation. Patients can also be motivated by having a goal of lowering the seat height a notch, as they get stronger.

University of Missouri DPT students participate in a service learning project at a local aging in place facility. This adjustable standing device has been

used effectively with community members participating in a leg strengthening and balance exercise program. To establish initial parameters for progressive resisted training, the height was adjusted until the participant was able to perform 10 to 15 reps before fatiguing.<sup>3</sup>

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# OPEN LETTER TO MEMBERS OF THE ACADEMY OF GERIATRIC PHYSICAL THERAPY

Dear Academy Members,

Thank you for your commitment to the physical rehabilitation of older adults. We serve during a time when “population ageing is unprecedented, a process without parallel in the history of humanity.”<sup>1</sup> Our commitment to older adults includes using our advanced clinical knowledge and experience to deliver exemplary care to older adults. It includes consulting with our colleagues about the needs of older adults and advocating for these needs on behalf of older adults. It includes education: to students, to each other, to other members of interdisciplinary health care teams, to policy makers and lobbyists, to older adults, and to the community at large.

I want to share an experience I had recently when I attended a meeting with other physical therapists from all areas of practice, not just geriatrics. An experienced physical therapist was presenting from a power point presentation projected onto a large screen from a laptop computer. He moved between presenting from the notes in his hand, the information displayed on the large screen, and the laptop. He took his glasses on and off repeatedly. He finally looked up at the audience and apologized for having to use his glasses at all. He said, “I swore I would not wear glasses, but as time has shown, I now reluctantly must submit to getting old.” I found myself wondering why he made this comment. I thought that he looked rather distinguished and wise in his glasses.

A few minutes later another presenter took the floor. As she introduced herself she commented that she would not “date” herself by sharing when she graduated from school. A bit later when she referred to one of her co-presenters she said that she would not “age” him by stating how long he had been involved in a certain project. I again found myself wondering why the message here was

a negative one. Weren't these physical therapists proud of the wisdom and knowledge they have accumulated over more than 25 years of experience and are now sharing with those of us who are less knowledgeable and experienced?

While it may seem trivial, these seemingly benign remarks are what perpetuate negativity towards aging in our society. This culture is what renowned geriatrician, Dr. William Thomas calls a “declinist view” on aging. He says, “We live during a time when older people are deemed worthy only to the degree that, in their thoughts and actions, they resemble young people.”<sup>2</sup> Dr. Thomas supports a view that aging is a naturally occurring phenomenon that affords the older adult “access to a collection of experiences and insights that are beyond the ability of the young to understand or fully appreciate.”<sup>2</sup> While the negative comments towards aging such as those made by our physical therapist colleagues above are not discriminatory against older adults and therefore not ageist, they still breed negativity and a declinist view on aging that has the potential to cultivate ageism.

As a group of health care professionals who devote our working lives to the betterment of the lives of older adults, we collectively possess the ability to shift the current societal view of aging as inevitable decline towards one that views aging as “a useful and essential part of life.”<sup>2</sup>

Many physical therapists have recently advocated for older adults by preparing for Fall Prevention Awareness Day in September and planning activities for PT Month in October. Let us keep our advocacy alive well into November and through the New Year by first and foremost, being aware that a declinist view of aging is all around us. Let us reinforce our commitment to the older adults we serve by not making declinist comments about ourselves, our

families, our patients, our students, or our colleagues, and by gently replacing a negative remark about aging with a positive one. Perhaps doing this will impact the ageism that is all around us as well.

Respectfully,

Jacqueline Osborne,  
PT, DPT, GCS, CEEAA

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# THE EFFECTS OF PHYSICAL ACTIVITY ON THE PROGRESSION OF DEMENTIA: A REVIEW OF LITERATURE

Jessica Guido, DPT; Tyler Hess, DPT; Amanda Polaha, DPT; Thomas Redinski, DPT; Heather Fritz, DPT

## INTRODUCTION

Dementia is a chronic neurodegenerative disorder linked to a decrease in cognitive function and an overall functional decline.<sup>1,2</sup> Dementia is associated with a deterioration in at least two brain functions including memory, language skills, visual perception, and the ability to focus or pay attention.<sup>1</sup> The cortex in individuals with dementia shrinks as cells die and the disease progresses. This causes damage to the areas involved in thinking, planning, and remembering.<sup>2</sup> The volume of the hippocampus also decreases significantly, affecting the formation of new memories.<sup>2</sup>

There are approximately 3.8 million Americans that suffer from dementia, and its prevalence is expected to quadruple by the year 2047.<sup>3,4</sup> There is limited evidence showing that pharmacologic interventions are beneficial in combating the progression of dementia, thus there has been an emphasis on the role of non-pharmacologic interventions to care for the increasing number of individuals who suffer from dementia. Individuals with dementia may reap benefits from regular exercise. Even if the underlying physiology cannot be altered, it is important for individuals with dementia to maintain their strength, endurance, and functional mobility as their disease progresses.<sup>3</sup> This will decrease the burden that many caregivers, both formal and informal, endure. This review of literature will look at the effect that physical activity has on individuals with dementia. It will not only examine the musculoskeletal effects, but also the emotional effects that this disease creates on individuals diagnosed with dementia.

## METHODS

For this review, MEDLINE, CINAHL, PubMed, Cochrane Library, Academic Search Premier, Health Source:

Nursing/Academic Edition, and Pedro databases were all searched during the fall of 2014 using MeSH database terminology. All articles that met inclusion criteria were read and reviewed by all group members.

## RESULTS

### Musculoskeletal Effects of Physical Activity

As individuals age, many begin to develop deviations in their gait cycle associated with decreased strength and endurance. These deviations put these individuals at risk for decreased safety awareness with ambulation, increased falls, and overall decreased functional mobility.<sup>5</sup> These risks are not only increased in individuals with dementia, but they are more progressive due to the nature of the disease when compared with older adults who do not suffer from cognitive impairments.<sup>6</sup> Individuals with dementia appear to maintain the capacity to ambulate well into the disease process, however, usually display decreased lower extremity strength and increased rate of falls. These rates continue to increase with disease severity.<sup>5</sup>

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"...it is important for individuals with dementia to maintain their strength, endurance, and functional mobility as their disease progresses."

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Several studies have examined the effects of strength training on individuals with dementia in order to increase strength and gait performance. Many of these studies have shown benefits directly related to physical activity. Individuals with dementia who are able to ambulate and transfer independently displayed significantly higher knee ex-

tensor muscle strength compared to individuals with dementia who were unable to ambulate or transfer independently.<sup>4</sup> This shows the importance of strengthening lower extremity muscles in order to maintain functional mobility. Furthermore, individuals with dementia showed physical function improvement, including better balance, improved mobility, and increased lower body strength following a 4-month home exercise program. Those who did not participate in this home exercise program showed a decline in their physical functioning.<sup>4</sup> There was a noticeable strength increase in individuals with dementia who participated in a resistance training program consisting of 6 weeks of exercise using TheraBand, a brand of elastic resistive band.<sup>5,7</sup> These studies display the importance of exercise programs on maintaining strength and functional mobility in individuals with dementia.

A study by Suzuki et al<sup>6</sup> examined the relationship between knee extension strength and lower extremity function in subjects with dementia.<sup>6</sup> This study used a hand-held dynamometer to look at knee extensor strength of 45 nursing home residents. Subjects were categorized into two groups, those who were able to transfer to bed, toilet, shower, and walk independently and those who required assistance. This study found that knee extension strength was a significant predictor of the individual's ability to transfer and ambulate independently.<sup>6</sup> The findings from this study demonstrate the importance of strength training programs in order to maintain functional mobility for individuals with dementia.

Hageman et al<sup>5</sup> looked at the effects of a 6-week resistance training program on individuals with dementia. This study examined 26 individuals

in an adult day care setting. Each participant completed baseline measures of lower extremity strength and gait ability using the Tinetti Gait Assessment scale, the Timed Up and Go (TUG) and the Gait Assessment Rating Scale (GARS).<sup>5</sup> The subjects were asked to participate in a “moderate-intensity progressive resistance lower extremity exercise using theraband.”<sup>5</sup> Participants completed 2 to 3 sessions per week for a 6-week period. A postintervention review of strength and gait showed that although there was an improvement in all gait measures, fast-gait time was the only statistically significant change.<sup>5</sup> The authors concluded that a 6-week resistance training program was not of significant duration or intensity in order to produce statistically significant changes.

An additional study completed by Thomas et al<sup>7</sup> looked at the benefits of using resistance-exercises to increase strength and functional mobility in individuals with dementia.<sup>7</sup> This study recruited 28 subjects from an adult day care facility. Participants were initially assessed by measuring the strength of knee extensors, hip flexors, dorsiflexors, and hand grip. Subjects’ lower extremity functional mobility was also assessed based on repeated sit-to-stands (STS) and gait speed. Participants then completed a moderate intensity progressive resistance training up to 3 days a week for a 6-week period. This study also showed improvements in some areas, including quadriceps strength, hand grip strength, STS, gait speed, and the TUG, yet showed declines in areas such as hip flexor and dorsiflexion strength.<sup>7</sup> The researchers concluded that these results provided evidence that a resistance exercise intervention of longer duration and greater intensity may produce more desirable and statistically significant results for individuals with dementia.<sup>7</sup>

These studies show that therapeutic exercises, in particularly resistive training, may help to increase strength in individuals with dementia. In addition, cognitive impairments such as dementia should not be considered a barrier to rehabilitation.<sup>8</sup> This increased strength in lower extremity muscles may help individuals to maintain functional mobility and overall independence.

### **Exercise and Cognitive Impairment**

Diminished functional capacity and increased cognitive impairment are two recognized markers for dementia.<sup>9</sup> In addition to the physical effects of exercise for individuals with dementia, the cognitive benefits of exercise within this population has been analyzed. Stevens et al<sup>9</sup> compared the effects of no exercise, the effects of social interaction, and the effects of a moderate exercise program on the cognitive abilities of individuals with dementia. The moderate exercises group consisted of a 3-minute exercise program over a 12-week period.<sup>9</sup> Cognitive abilities were measured by the Clock Drawing Test. This test requires individuals to draw a clock after receiving specific instructions from the test administrator.<sup>9</sup> The test has been found to assess cognitive function and overall brain activity changes.<sup>9</sup> The control group’s posttest score increased to -0.1333 and the social interaction group’s posttest score also increased to -0.6667. An increase in the posttest scores indicates a cognitive decline. Individuals in the exercise group were found to have a decrease in the posttest scores, 0.1250, which suggests that cognitive function may have improved.<sup>9</sup>

Simple walking programs have been analyzed for their effects on the progression of cognitive impairments. Vreugdenhil et al<sup>10</sup> conducted a randomized controlled trial to examine the effects of a daily walking program.<sup>10</sup> The study consisted of a walking program for 30 minutes a day with a caregiver, along with 10 minutes of light exercise. Functional mobility was assessed using the TUG, STS, and Functional Reach (FR). Activities of daily living (ADLs) were assessed using the Barthel Index, and cognitive abilities were assessed using the Mini Mental State Examination (MMSE). These assessments took place over 4 months.<sup>10</sup> Participants in the exercise group not only showed improvements in ADLs and their performance on the TUG, but also showed a significant 2.6 score difference on the MMSE. This increase shows improved cognitive abilities.<sup>10</sup>

In addition, Vernturelli et al<sup>11</sup> investigated the effects that a walking program has on cognitive impairments and the functional capacity on individuals diagnosed with dementia.<sup>11</sup> In this randomized control trial, individuals

were measured and their scores analyzed using the 6-minute walk test, the Barthel Index, and the MMSE. Though individuals in the exercise group showed improvement on the 6-minute walk test and on the Barthel Index scores, they demonstrated a 13% decrease in MMSE scores.<sup>11</sup> However, the control group showed declines in all aspects; including a 47% decline in MMSE scores.<sup>11</sup> This indicates greater cognitive impairments. Despite, the decline in the MMSE scores for the exercise group, a walking program has still been found to slow the progression of cognitive impairments.<sup>11</sup>

### **Depression**

Depression is an emotional effect that often accompanies dementia. According to Gruetzner, depression is a prolonged disturbance of mood.<sup>12</sup> Common symptoms include feelings of sadness, withdrawal, loneliness, self-neglect, and sleeping problems.<sup>12</sup> In the early stages of dementia, depression can occur as a reaction to the decline in cognitive function, as the individual still has the capability of understanding the full implications of the disease.<sup>13</sup> Not being able to recognize depression as an accompanying symptom of dementia is a significant barrier to treating these individuals effectively.<sup>13</sup>

Along with physical activity affecting physical health and cognition, the effects of exercise have been thought to attenuate the symptoms of depression. “In elderly individuals without dementia, randomized controlled clinical trials have demonstrated that exercise successfully reduces depression.”<sup>14</sup> Therefore, exercise may also provide the added benefit of reducing levels of depression for elderly individuals with dementia.

In a study conducted by Vreugdenhil et al<sup>10</sup> on 40 subjects with dementia, half were provided with an exercise program in an attempt to study the effects that exercise has on depression, as well as cognitive and physical function, ADLs, and caretaker burden, as mentioned previously. The other 20 subjects were placed into a control group. The Geriatric Depression Scale was used to assess subjects at baseline and at the 4-month follow-up. A maximum score of 15 was possible, with a score above 5 indicating depression.<sup>10</sup> The results show an improvement in depression for the treatment group. While the control

group's averages on the Geriatric Depression Scale were the same at baseline and after the 4-month follow-up.<sup>10</sup> These results indicate that exercise can lessen depressive symptoms that individuals with dementia may experience.

In another study by Teri et al,<sup>15</sup> 153 community dwelling participants with dementia were randomly placed into an exercise group or usual care group. For the exercise group, exercises and behavioral plans were demonstrated during each treatment session for 3 months. The Cornell Scale for Depression in Dementia was used to measure the participant's affective status. There is a maximum score of 38 on the Cornell Scale for Depression in Dementia with a score above 12 indicating probable depression. After 3 months of treatment, participants in the treatment group, showed improved scores, which indicate a decrease in depression.<sup>15</sup> While the participants in the control group had worse scores, which indicate an increase in depression.<sup>15</sup> These results were found to be the same at the 2-year follow-up; those who participated in the exercise program maintained a decrease in depression.<sup>15</sup> It is important to note a limitation in this study was the decline in participants along the longitudinal analysis of this study.

Overall, physical activity has been found to provide additional benefits for elderly individuals with dementia.<sup>15</sup> Christofolotti et al<sup>16</sup> notes that, "Motor interventions cause immediate effects on depressive symptoms."<sup>16</sup> Even simple physical activities have been shown to decrease the symptoms of depression in individuals with dementia.<sup>15</sup>

### Caregiver Burden

Another important factor to consider when talking about dementia is the strain that may be placed on the formal and informal caregivers to these individuals. This not only includes the staff members of nursing homes and assisted living facilities that a person with dementia may be residing in, but also the family of the individual with dementia whether they are living in one of these facilities or if they are still living at home.<sup>17,18</sup> Another aspect of the amount of stress that may be placed on the individuals providing care is related to the severity of the recipient's dementia.<sup>19</sup>

An article by Cohen et al<sup>19</sup> examined the strain put on families to care for individuals with dementia based on the severity of the dementia and the types of activities that are included in caring for these individuals. They used an experimental group of individuals with dementia and a control group of individuals without dementia. What they found was that families reported feeling the same level of burden caring for individuals with dementia as the control group. However, the types of activities done with and for the individuals with dementia were different. The researchers found that more time was spent on activities, such as speaking with the caretakers at the facility about proper care for their family member and less time was spent on contacting the individual staying at the facility when not visiting.<sup>19</sup> The study also found that this switch in stress inducing activities would only occur for individuals with severe dementia and not for individuals with mild dementia.<sup>19</sup> One potential explanation for the increased amount of stress felt in families of individuals without dementia was the difference in work status.<sup>19</sup> Families of individuals with dementia tended to be unemployed, where families of individuals without dementia tended to still work.<sup>19</sup> They felt that the stress may be coming from trying to juggle a job along with providing care for a family member that is living in one of these facilities.<sup>19</sup>

Other elements of caring for individuals with dementia that play into increasing perceived burden are the behaviors of these individuals.<sup>18</sup> Miyamoto et al<sup>18</sup> examined the effects of behavioral and psychological symptoms of dementia (BPSD) on elevating levels of burden on caregivers. The Zarit Caregiver Burden Interview (ZBI) was used as a means of measurement. Several factors were believed to increase ZBI scores in staff at the assisted living facilities that provided care for these residents.<sup>18</sup> Miyamoto et al<sup>18</sup> determined these factors to be "impaired function, the female gender, aggressive behavior, and other types of inappropriate behaviors, such as quarrelling and screaming."<sup>18</sup> The behaviors that would have the largest impact on other residents within the facility seemed to be the BPSDs.<sup>18</sup> It was uncertain why females were more

difficult to care for, but the authors explained that there are 3 times as many females living in assisted living facilities compared to men in Japan, the country where this study was conducted.<sup>18</sup>

Further evidence suggests that burden can be decreased for families and staff that provide care for individuals with dementia.<sup>17</sup> Lowery et al<sup>17</sup> examined the effect that administering an exercise program would have on individuals with dementia. They initially wanted to examine the effect of exercise on improving cognition scores, but studied caregiver burden as a secondary effect. With the administration of a 12-week walking program, primary caretaker's overall burden scores decreased.<sup>17</sup> The control group, individuals with dementia and their primary caretakers that did not receive a walking program, doubled their scores on the ZBI.<sup>17</sup> This indicates that the burden placed on the caretaker doubled over the 12 weeks.<sup>17</sup> These results suggest that administering an exercise program, specifically a walking program, can help decrease the burden being placed on care providers.<sup>17</sup>

### DISCUSSION

This review of the literature sought to find clinical evidence supporting the efficacy of exercise programs for individuals with dementia, focusing on the physical, emotional, and cognitive aspects of the disease. The information presented highlighted the potential benefit that a regular resistive training program can have on components of gait function, strength, and functional mobility in individuals with dementia. Suzuki et al<sup>6</sup> found a relationship between knee extension strength and lower extremity functions such as transferring, ambulating, and dressing the lower body. This suggests that individuals with dementia, who increase lower extremity strength throughout the disease process, can make functional improvements in flexibility, coordination, mobility, and safety awareness. The results support the need for strength training in individuals with dementia.<sup>6</sup>

Two similar studies further examined the benefits of resistive training on individuals with dementia. The researchers observed several gains in muscle strength and functional mobility among individuals with dementia after a 6-week resistance-exercise training program.<sup>5,7</sup>

All the participants in this study had improvements in their tolerated training loads over the time period. Furthermore, improvements on all measures of gait were noted, although these improvements were not adequate enough to be considered statistically significant.<sup>5</sup> The duration and intensity of this study were inadequate and future studies need to address the long-term effects of a resistance training program on individuals with dementia. These studies show the potential benefit that exercise may have on individuals with dementia in helping to increase strength, endurance, functional mobility, and overall independence.

Though exercise programs are shown to have positive effects on other aspects of dementia, their impact on cognitive decline in individuals with dementia remains unclear. Evidence is highlighted that both supports and rejects the hypothesis that exercise slows the progression of cognitive impairments. Researchers found that a moderate exercise program helped improve individuals' executive function, over those in a social or control group.<sup>9</sup> A simple walking routine improved individuals' scores on the MMSE.<sup>10</sup> In contrast, other researchers showed that individuals participating in a walking program still had a significant decline on the MMSE though it was less significant than the decline in the control group.<sup>11</sup> Overall, studies have shown that exercise does have an effect on cognitive decline in individuals with dementia, but the clinical relevance remains uncertain.

Research has shown that there is a relationship between physical activity and improved depressive symptoms in the elderly population. This association can also be applied to individuals with dementia. Evidence shows that physical activity does have an impact on decreasing depressive symptoms in individuals with dementia. Individuals with dementia did not experience an increase in depressive symptoms during a 2-year follow-up period.<sup>15</sup> Therefore, exercise may provide the added benefit of reducing the symptoms of depression. Several studies have concluded that dementia and its related behaviors have an influence on the amount of perceived burden placed on primary caregivers for these individuals.<sup>17-19</sup> Research has

shown that it is primarily the behaviors of individuals with dementia that affect other residents in assisted living facilities and ultimately has a greater influence on caregiver burden.<sup>18</sup> Through the implementation of an exercise program, these ratings of perceived caregiver burden have been shown to decrease. On the other hand, caregivers to those individuals with dementia that do not receive exercise have drastically increased their scores of perceived burden.<sup>17</sup> Another important aspect to understand is how burden is perceived by caregivers. The responsibility of providing care for an individual in an assisted living facility may always be a burden; however, the tasks related to perceived burden tend to differ from caregivers to individuals with or without dementia. Caregivers providing care for individuals without dementia typically revolve around issues related to contacting the family member, running errands for them, and monitoring finances. Caregivers of individuals with dementia have an increase in burden ratings in regard to an activity such as, discussing care with staff members.<sup>19</sup>

There were several limitations encountered during the course of gathering research for this review. One issue was the amount of resources readily accessible. The institution through which resources were gathered was limited. Articles published within the last 6 months were not accessible through the databases. The institution was also unable to gain access to certain journals and periodicals relevant to the topic. Another limitation was the limited amount of randomized controlled trials pertinent to the topic. If the institution had access to the most recent research published and did not have an access restriction, then more in depth and updated information could have been included for this literature review.

Dementia has been shown to cause significant impairments in many aspects of an individual's life, including physical, emotional, and cognitive abilities. This disease not only impacts these individuals but also places increased stress on their caregivers. A literature review was conducted to help provide evidence on the efficacy that physical activity has on the progression of dementia. The studies included in the review reported some benefits to physical activity in the

management of dementia. Overall, the findings suggest that physical activity may play a role in delaying the progression of dementia. Further research may be warranted in order to see if exercise programs of longer duration would yield more beneficial results.

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# ARE WE RECOGNIZING CONCUSSION IN THE ELDERLY?

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## INTRODUCTION

Concussions have been well researched in the athletic population; however, concussions in the geriatric population have not been as heavily investigated. Are elderly patients who sustain an orthopedic injury, such as a traumatic hip fracture during a fall, being assessed for a possible concussion? Pfortmueller et al<sup>1</sup> suggest that mild traumatic brain injuries may be more prevalent in the elderly after falls because they have inefficient reflexes and decreased ability to break their fall compared to the younger population. This leads to the speculation that concussions may be a contributor to delayed recovery and a declined mental status in many elderly patients following a fall. The focus of this paper begins with the question, Are we recognizing concussions in the elderly? This question is broken down into whether changes occur from normal aging sequence and development, genetic influence, or acute injury. Age changes and acute injury will each show their own signs and symptoms, but some may be less dramatic than others. Throughout this paper, the topics of the aging brain, etiology of head injuries in the elderly, typical presentation of a concussion, effects of anesthesia, and concussion assessment tools will be discussed.

The literature search was performed using PubMed, Google Scholar, PTNow, and *Physical Therapy Journal*. Searches were executed for articles on concussions in the elderly, published between 1992 and 2013. Key words included concussion, assessments, falls, elderly, mild traumatic brain injury, head injury, diagnosing concussions, assessing concussions, effects of anesthesia on elderly, concussion management, aging brain, athletes, sports concussions, and brain damage associated with concussion. The articles obtained from these searches provided content and background in-

formation on the current management and diagnostic tools for concussions, as well as the effect of anesthesia and head injuries in the elderly.

## CONCUSSION BACKGROUND

Marshall<sup>2</sup> defines a concussion as an injury that is “caused by a direct blow to the head or to another body region resulting in an abrupt acceleration and/or deceleration of the craniocervical complex.”<sup>2(pg.299)</sup> Quick or sudden movements can cause the brain to hit up against the skull that causes injury to the brain tissue. The most common symptoms that are associated with concussions are headaches (94.3%), unsteadiness/dizziness (75.5%), and difficulty concentrating on specific tasks (53.9%).<sup>2</sup>

Many sports put participating athletes at risk for head injuries, even more so than we thought previously. According to Marshall,<sup>2</sup> about one-third of all athletes experienced concussion-like symptoms.<sup>2</sup> Concussions in the elderly following a fall may be more prevalent than we currently think. Symptoms occur not only with direct head blows, but also can occur and with an indirect blow. Head trauma does not only take place when a person’s head hits off a table or the floor; it can occur when the whole body jars. Thus when the person who is elderly falls, could their fall be accompanied with a concussion?

Bailes and Hudson<sup>3</sup> state that a concussion is a mild traumatic brain injury (TBI). In a study done by Fletcher, Khalid, and Mallonee<sup>4</sup> in Oklahoma between the years 1992-2003, approximately 158 out of every 100,000 individuals over the age of 65 was diagnosed with a TBI each year. According to the U.S. Census Bureau, since 2010 the baby boomer population has been steadily increasing.<sup>5</sup> With this staggering statistic, individuals over the age of 65 are considered to be one of the highest risk groups to have

a TBI, along with children under 5 years old; and persons between the ages 15 and 24. Although concussions are only considered to be mild TBIs, they are still serious and can result in delayed or less than optimal outcomes compared to the younger high risk groups.<sup>4</sup> Mortality of older individuals over age 65 is 2 to 3 times higher.<sup>4</sup> Marquez de la Plata et al<sup>6</sup> found that disability is significantly higher in elderly individuals 5 years following a brain injury than any other population. Regeneration and recovery in the aging brain is significantly more limited. When a brain injury occurs to an already diminishing structure, the combination wreaks havoc leading to more debilitation in an elderly person’s future functioning and quality of life.<sup>6</sup>

Rakier et al<sup>7</sup> examined the causes, associated diseases, and outcomes of elderly patients who had suffered head injuries. Half of the patients for the study were obtained prospectively, and the other half retrospectively. Each patient had a CT scan on admission, a full record of pre-existing conditions, and then the group was separated into 6 different diagnostic groups based on results: (1) concussion, (2) contusions, (3) diffuse axonal injuries, (4) acute subdural hematomas, (5) acute epidural hematoma, and (6) chronic subdural hematoma. Concussions were the most frequent head injury found in the study. The researchers stated that the less elastic brain and increased fragility of the aging blood vessels in the brain may contribute to the frequent concussions. The main causes for these injuries were found to be falls and road accidents as pedestrians. Additionally, Zeng, Pan, and Hu<sup>8</sup> specified that the leading cause of TBI for older adults in the United States are falls, followed by motor vehicle accidents. Rakier and colleagues<sup>7</sup> found the overall main cause of falls was precipitated by pre-existing conditions and/or liability to falls due to impaired

balance. An overwhelming number of these patients were found to have some sort of pre-existing disease; cardiovascular disease ranking first.<sup>7</sup> Concussions related to sports injuries have been in the forefront of the news as of late. Although concussions are frequent, they are not all recognized and treated appropriately. The main population in which concussions are not being recognized is in the elderly population. Each person that experiences a concussion will experience his own set of symptoms, recover at different rates, and require person-specific treatment. It is important to stage each individual's condition in a specialized manner to allow the proper amount of time before returning him or her to sporting or daily activities.

Meehan et al<sup>9</sup> looked into the prevalence of undiagnosed concussions in athletes. Many athletes are either struck in the head or sustain indirect trauma to the head throughout competition and games. However, the majority of these traumas are not viewed as serious enough to treat while the athlete continues to participate with minimal to no symptoms of a head injury. Similarly to the elderly population, trauma to the head is not fully being recognized following a fall or orthopedic injury. These patients are being discharged home without further treatment of the head injury. According to the authors, a concussion is a "complex pathophysiological process affecting the brain, induced by traumatic biomechanical forces."<sup>9(p339)</sup> Also, concussions can be caused by a direct blow to the face or a blow that indirectly jars the head or brain.

LaBortz et al<sup>10</sup> found that 17% of college athletes who were surveyed were diagnosed with a concussion, while 48% of college athletes admit to have experienced a trauma to the head with concussion symptoms.<sup>9</sup> With all of the research present for concussions in athletes and the paucity of research in the elderly, these statistics suggest that recognition of concussions in the elderly may be worse. It seems to be logical that recognition of concussion should surface as a primary concern for future research.

## RECOGNIZING CONCUSSIONS

There are a variety of symptoms that can be associated with concussions acutely. Every person that experiences a concussion will respond differently due to the severity and mechanism of

injury. Harmon et al<sup>11</sup> stated in their review that symptoms can be physical, cognitive, emotional, or sleep-related. Physical concussive symptoms in all populations consist of headache, nausea, vomiting, balance difficulties, dizziness, visual issues, fatigue, sensitivity to light, sensitivity to noise, numbness, and confusion. It is important to remember that not all of these symptoms will be present, and each person will have individualized complaints. These researchers continued to note cognitive symptoms that could be reported as feeling foggy, slowing down, difficulty concentrating, memory loss, confusion, and slow responses. Next, the concussed population may have emotional sensitivities that could be seen as irritability, sadness, nervousness, and overly emotional.<sup>11</sup> Lastly, a person with a concussion may show signs of drowsiness and abnormal sleep habits. Lovell et al<sup>12</sup> reported signs that may be observed by others associated with individuals who are suffering from a concussion. These reported observations include dazed appearance, confusion, forgetfulness, disorientation, loss of consciousness, personality changes, slowed response, and loss of memory.<sup>12</sup>

McClincy et al<sup>13</sup> stated that there are approximately 300,000 concussions reported each year by American athletes. Under older concussion assessment guidelines, each diagnosed concussion had a different degree of severity or stage that helped to diagnose them accordingly. The American Academy of Neurology has removed the concussion grading scale under their new sports concussion assessment guidelines.<sup>14</sup> Their current guidelines of concussion management emphasize physical and cognitive rest until symptoms resolve; followed by a graded program of activity, in an average of 7 to 10 days. With the new concussion guidelines, the American Academy of Neurology has helped the public understand that an individual does not have to lose consciousness in order to sustain a concussion. While sports medicine health care professionals are improving the concussion management of their athletes, the same does not hold true for our elderly population. Are elderly patients, who have sustained an orthopaedic injury or fall, being properly assessed for head injuries, especially if they never lost consciousness? Are these patients being sent home after treatment of their orthopaedic injury before being

cleared of their concussion symptoms? Do health care professionals treating these elderly patients understand that just because their patient did not lose consciousness, it does not mean there is an absence of a mild TBI. Continued monitoring and limiting activity is necessary in all populations, not just athletes.<sup>14</sup>

Concussion symptoms can linger and hinder an individual for varying amounts of time. McClincy et al<sup>13</sup> provided support that concussive symptoms can be present 7 days postinjury. The ImpACT test establishes a baseline by collecting data on cognition, short-term memory, and concussion symptoms. The post-concussion score is compared to the baseline score and is used to establish return to activity timetables and guidelines. Using the ImpACT testing program, there were abnormal signs of verbal memory, visual memory, processing speed, reaction time, and symptom score when compared to baseline readings. Research completed by Lovell et al<sup>12</sup> supported these findings, and also showed that the majority of these tests were normalized around 35 days postinjury, but this was only in the athletic population.

Although the majority of concussions resolve in 7 to 10 days, some symptoms can last weeks, months, or even years. When symptoms reach these stages they are termed post-concussion syndrome. Commonly reported symptoms of this illness are headaches, dizziness, insomnia, exercise intolerance, cognitive intolerance, depression, irritability, anxiety, memory loss, concentration difficulties, fatigue, or sensitivity to noise and light. Increasing age, female sex, and nonsport-related concussions are some of the risk factors that can be associated with this syndrome.<sup>11</sup> This suggests that the elderly population is at a high risk for post-concussion syndrome, especially when considering the frequency of falls leading to head trauma.

In addition, McClincy et al<sup>13</sup> showed that there can still be slight delays seen at 14 days postinjury in verbal memory and visual memory. Lovell et al<sup>12</sup> also supported these delayed recoveries and reported that symptom-free concussive patients may still show abnormalities in neuropsychological testing. Following this information, it is important to note that concussion symptoms can last an extended amount of time. Symp-

toms should be properly managed and examined before labeling patients as recovered.

### THE AGING BRAIN & HEAD INJURY ETIOLOGY IN THE ELDERLY

Our senses, memory, knowledge, and intelligence are affected as the brain ages.<sup>15</sup> Even in healthy individuals, the brain ages throughout time. The aging process makes tissue less adaptable and less able to repair or fully recover after injury.<sup>15</sup> Therefore, concussions late in life may be more detrimental or debilitating than a concussion in earlier years. Also, concussive symptoms may be masked by the age-related process in the brain.

Normal aging includes atrophy of the brain of up to 15%.<sup>15</sup> With a decrease in the size of the brain, it can be concluded that there is also a decrease in neural connections that are associated with the atrophy. Some causes of atrophy or neural degeneration are decreased myelin or necessary neurotransmitters that help to pass signals in the nervous system. The physical presentation of decreased sensation, memory, knowledge, and intelligence can be seen with the normal decline with the elderly. Memory can be compromised. The decrease in neural connections can cause the person not to remember previous events, such as those associated with concussion symptoms. Ability to acquire new knowledge decreases due to a reduction in neural connections just like with memory. This is why older individuals have a tough time finding the right word to say and take a while to think.<sup>15</sup>

There is a significant amount of research that suggests that vascular factors play a strong role in the etiology and pathogenesis of brain degeneration.<sup>16</sup> Cerebrovascular disease has been found to cause arteriosclerotic dementia, which is the second most common form of brain degeneration. In early brain degeneration research, aging related progressive hardening of the arteries is blamed for arteriosclerotic dementia. These vascular changes may lead an elderly brain more susceptible to a diffuse brain injury.<sup>16</sup>

By understanding how the brain normally ages, it will allow medical professionals to better recognize concussion symptoms in the elderly. Since the brain is slowed with aging, we cannot expect

to see the same signs in the elderly as we do with younger individuals. Even without head trauma, older individuals may struggle with current testing protocol for concussion.<sup>16</sup> Furthermore, knowing that the elderly population recovers functionally slower from a TBI, it is an important consideration when providing appropriate intervention.<sup>8</sup>

Haydel<sup>17</sup> established age as a stronger predictor for poor outcomes following a TBI than the mechanism of injury. He states there is a peak in occurrence of TBIs in adults greater than 75 years of age. He suggests that elderly patients with mild TBI have an increased risk of intracranial injury. Also, patients who have a mild TBI while on anticoagulants or antiplatelets, and patients who have multiple comorbidities are at a higher risk of intracranial injury. Adults 65 years of age or older have the highest rates of hospitalizations and deaths following a TBI. There is a correlation between age and risk of mortality following a TBI that suggests it may occur due to cerebral atrophy, and fragile veins may be disrupted even with low trauma.<sup>17</sup>

Papa et al<sup>18</sup> acknowledged that falls in the elderly are the leading external cause of TBIs. They are the primary cause for over 80,000 emergency department visits per year by the elderly. Traditionally, the older patients who suffer head trauma tend to have poorer outcomes secondary to comorbidities, medications, premorbid cognitive difficulties, and the physiology of the aging brain.<sup>18</sup> These are all factors that should be taken into consideration after an elder has reported a fall not only with head trauma but also without head trauma.

Papa et al<sup>18</sup> also notes that the geriatric patients can be more difficult in assessing head trauma due to the changes of the brain with aging. They suggest that intracranial bleeding is much more common in this population following head injuries. Typically, physicians will be able to identify signs and symptoms of a hemorrhage in the brain. However, the aging brain may be more difficult because the natural deterioration of the brain allows more room for the blood to accumulate. In addition, Papa et al<sup>18</sup> commented that it could take 9 hours to 3 days after a head injury for an accurate diagnosis to be made.

Kotwica and Jakubowski<sup>19</sup> analyzed

the clinical outcomes of people older than 70 after a serious head injury. Upon admission to the neurosurgical ward, the Glasgow Coma Scale (GCS) was used for clinical grading. The researchers found that in patients with a nonsurgical lesion and a GCS below a 9, their mortality rate was 80%. If the patient had a nonsurgical lesion and is conscious after trauma, aggressive treatment of extra-cranial complication is most important, because their brain injury is usually well-tolerated. If pneumonia and/or cardiopulmonary complications do not occur, these patients often have a good prognosis.<sup>19</sup>

In a similar study conducted by Ritchie et al,<sup>20</sup> the GCS was correlated to the functional outcome and mortality of patients over the age of 65 presenting with an acute head injury. All of the patients with a GCS less than 11 at injury presentation had a poor outcome on discharge. Compare this to the data of patients with a GCS greater than or equal to 11, they had a satisfactory outcome. Severe concussions in the elderly have a more detrimental effect on the patient. Higher precautions should be taken when assessing these patients to ensure proper diagnosis and intervention.<sup>20</sup>

### EVALUATION OF TRAUMATIC BRAIN INJURY/CONCUSSION

Pfortmueller et al<sup>1</sup> found that mild TBI was the second most common type of injury out of 1400 elderly patients who were admitted to an emergency department after sustaining a fall. The high occurrence rate of mild TBI in the elderly is confirmed by Waston and Mitchell.<sup>21</sup> Haydel<sup>17</sup> states that the terms “concussion,” “mild TBI,” and “minor head injury” are all used interchangeably. Similar to Marshall,<sup>2</sup> Haydel<sup>17</sup> defines a concussion as, “a patient who sustains a traumatic force to the head resulting in a transient alteration in cognitive abilities, motor function, or level of consciousness.”<sup>17(p2)</sup>

Haydel<sup>17</sup> identified falls as one of the top 4 leading causes of TBIs treated in the emergency department. Pre-hospital care is critical for a good prognosis, thus a brief neurological examination should be completed focusing on GCS score, pupillary examination, and overall motor function. Emergency department management is especially important with diagnosing concussions. This is because concussions are a symptom-based di-

agnosis and the emergency department clinicians are the first to see the patient.

Emergency nurses are often the health care professionals that will perform the initial GCS determining if there are any neurological insults present. The GCS helps the emergency department staff to establish a baseline neurologic functioning level, and determine whether immediate intervention is required. When properly administering the GCS, emergency staff uses this scale to prevent secondary brain damage from cerebral depression, hypoxia, or ischemia.<sup>22</sup> The medical staff is required to take a focused history on the description of the traumatic event, which will later be used in making a diagnosis. The neurological examination at the emergency department should include GCS score, cognitive functioning, pupillary examination, and motor and balance function.<sup>17</sup>

In a study conducted by Marshall,<sup>2</sup> athletes who were in rehabilitation at an outpatient clinic for various injuries, were considered to have had a past concussion if they answered “yes” to the following question: “Have you ever sustained a blow to the head which was not diagnosed as a concussion, but was followed by one or more of the signs and symptoms listed in the Post-Concussion Symptom Scale?” This list of symptoms associated with concussions included headaches, nausea, and irritability. Then they were asked to rank the symptom with a 0 (no symptom) to 6 (severe). A total of 486 patients were included in the survey and the final analysis. A total of 148 patients reported they had a blow to the head that resulted in concussion-like symptoms; this is 31% of those who were surveyed.<sup>2</sup> A similar evaluation should be completed with elderly patients who have sustained a fall. It should not be limited to those who have sustained a direct trauma to the head because indirect head trauma can result in a concussion.

### **CONCUSSION ASSESSMENT TOOLS**

An extended Glasgow Coma Scale (GCS-E) was created to be sensitive to mild cases of concussion. Nell et al<sup>23</sup> state that the original GCS is the “most widely used quantitative measure of the duration and depth of impaired consciousness after head injury.”<sup>23(p614)</sup> The

test has many advantages including ease of use and a high interrater reliability; but, its disadvantage includes not being able to distinguish severity of the brain injury. The new extended version takes into account an amnesia score that distinguishes between levels of milder injury. The original test was scored from 3 to 15, the new additional amnesia score is based on a scale from 0 to 7. In both scales the higher score represents a better performance (for example, 15:7 is a better score than 13:5). The researchers applied the test to patients who had a blow to the head or a concussion as well as a GCS score of 13-15. The addition of the amnesia score to the GCS resulted in identification of mild cases of concussion. Verification of these mild cases allowed for proper treatments until symptoms were relieved.

Nell et al<sup>23</sup> state that without proper diagnosis of concussion syndrome, many symptoms, including irritability, unreliable memory, and fatigue, are misdiagnosed as posttraumatic stress. For example, a person experiences a fall that results in an open reduction and internal fixation (ORIF) of a fractured femur, but he was never assessed for a possible concussion. After an ORIF, the medical professionals or family members may attribute the patient’s cognitive issues to posttraumatic stress from the fall or surgery but in reality the patient may have injured his head resulting in a concussion. Improper recognition of these symptoms will lead to failure of appropriate treatment and may put the patient at risk for a subsequent head injury. The new GCS-E could replace the original GCS in emergency rooms, using it with all patients who have fallen or had head trauma. It would be able to access for the presences of mild to severe concussion symptoms, resulting in proper treatment for the patient.<sup>24</sup>

Schatz et al<sup>24</sup> established the diagnostic utility of the Immediate Post-Concussion Assessment and Cognitive Test (ImPACT). The study demonstrated a combined sensitivity of ImPACT and symptom score of 81.9%, and specificity of 89.4%, providing validity evidence for the ImPACT as a diagnostic test for concussions. The disadvantage for the ImPACT test is that it needs a baseline score for comparison. This required score prior to concussion would be difficult to gather for people who

experience an emergency total hip arthroplasty after a fall because they would not be seen until after the trauma.<sup>25</sup>

### **DISCUSSION**

Recognizing the common symptoms associated with a concussion can improve the health care professional’s ability to differentiate whether further tests need to be run to diagnose a concussion. It is common to have a headache after a fall; however, it could be indicative of further damage. It is important to remember that patients presenting with symptoms of concussion are very involved patients and should be monitored very closely. This is why it is important to recognize the symptoms of the older adult population, just as it is recognized in an athletic population.

Currently there is a focus on direct head trauma and its symptoms; however, indirect trauma can have a similar presentation. Since indirect trauma is a secondary injury, it is more difficult to diagnose due to the focus of care being directed to the primary injury of the fall. The ImPACT tool could be used to evaluate residents, who are admitted to a skilled nursing or extended care facility as a baseline reference measure. If or when the resident had a traumatic event, re-evaluation with the ImPACT tool would be useful in identifying concussions. Another proposal would be to implement the ImPACT with patients who are at a known high-risk for falls.

### **CONCLUSION**

Throughout this literature review, potential incidence of concussions related to direct and indirect head trauma in the elderly population were investigated. There is research regarding elderly patients having a TBI, but it does not compare to the amount of evidence in the athletic population. Elderly patients who sustain a fall that require a trip to the emergency department are not being assessed for a possible concussion and this needs to change. Different factors can influence presentation and prognosis such as severity of the fall and use of anesthesia and co-morbidities. Assessment of head injuries is an important area of research and more studies need to be done, specifically on diagnosis and prognosis of concussions in the elderly. Thus in conclusion, “Are we recognizing and evaluating concussion in our elderly population?”

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# THE OTHER SIDE

## My Experience With Total Hip Arthroplasty Surgery and the Medical Abyss A Three Part Series—1. Decisions 2. Hospitalization 3. Rehabilitation and Life Continued Series\*

Helen Corneley, PT, EdD

*\*Personal literary license- This series is part blog, part evidence, part experience, and part opinion. It is written with love and with compassion for anyone who enters our medical system for a procedure. It is written to reflect on the experiences of the patient/client/friend/family member/wife/partner/et al who are engulfed in the medical system. This is one story, my story, only one example. However, please read my experience, reflect on your experiences both as patients, caregivers, therapists, friends, and health professionals and decide how you will represent yourself as a physical therapist tomorrow and how you might make the system better.*

### DECISIONS

*I am sitting waiting for my husband...He is in surgery...His hip is being replaced...I am hoping all goes well...It is a long wait and lonely...time to think and reflect on the journey...*

Today is the day of THE long deliberated total hip arthroplasty (THA) surgery. We are excited but scared, so hopeful, but still uncertain about the change we expect to materialize in our lives—PAINFREE living/moving/walking, not being grumpy/irritable/a PITA (figure it out) aka classic chronic pain syndrome. I say “we” because having been married for 36 years most of my husband and my non-working activities are done together. If he can’t walk long distances, or is in pain or grumpy, it restricts and impacts the life activities for both of us. This is reality. (Note: Back to Basics (BTB) important point to include spouse/significant other/partner in the deliberations of surgical consult. They are the critical cog to success). Slowly, insidiously, my husband’s tolerance to the increasing pain lessened. He was still trying to do all the activities and work he had always done. But slowly, insidiously he became more and more intolerant of

the pain. His joy of gardening and taking care of our acre plus yard became an obstacle not a joy. Advil-Aleve-Tylenol, pain patches, yoga, stretching, etc, did not mask the fact that he was walking bone on bone and was in severe chronic pain and decidedly grumpy.

The decision for major elective surgery is not a simple one. How long do you wait? What level of pain is your tipping point? How much dysfunction will you tolerate before making the decision to in layman’s terms, “go under the knife?” What are the risks? Will I die? Will I walk better or worse? What kind of pain will I have with the surgery? After surgery will my pain be gone? Will I move better? Again, will I walk better? Who and what can I trust? This is my life or possibly not. Every surgery carries risks. These are the questions that need answers but have absolutely and irrefutably no definite answers for any one individual. This of course is what makes the decisions even more difficult and the anxiety of any elective surgery so very real for each individual.

Final decision to undergo elective surgery is a process of education, surgical consultation, and personal decision. However, in the end, decisions are made. Surgeons/and or hospitals and procedures are chosen. Surgery is scheduled, the surgery that will hopefully change your life to no pain and increased enjoyment of life. (Note: I didn’t revert to PT jargon of increased mobility, improved reciprocal gait, decreased pain because all people want to know is if they can get around better and feel better and have less pain. Lay persons are not trained in what activities exactly will make them more enjoy life more, or in PT terms more functional. They just want to feel and do better. BTB)

Our decision is made. Surgery for a THA is scheduled. (Note: decision solidified after we took a cruise to the

Baltic and our tour itinerary was chosen to not include hikes, cobblestones, stairs, etc. We were too young to be self-limiting our lives.)

Yeah! Look at the statistics. Total hip arthroplasty is one of the most commonly performed surgical procedures in the United States, with an estimated 148,000 discharges among individuals aged 45-64 years and 16,800 aged over 65 years in 2010. Utilization of THA is projected to grow by 174% between 2005 and 2030 and will continue to grow substantially in the future because of an aging population and the obesity epidemic.<sup>1</sup>

The average length of stay after THA among inpatients aged 45 and over decreased from 2000 to 2010, from nearly 5 days to just under 2 days. Most patients are expected to ambulate without assistive devices within 3 to 6 weeks after their surgery. Patients should exhibit operative hip strength  $\geq 4+/5$  MMT within 3 months following THA. The overall long-term goal for the patient is to at least return to their preoperative level of function with less pain; however, most tend to see an overall improvement when compared to their preoperative function. The degree to which patients reach these projected goals depends on the reason for the THA, prior functional level, co-morbidities and post-op complications.<sup>3</sup>

A recent literature review showed significant increases in WOMAC and SF-36 functional scores when comparing baseline to postoperative THA scores at a 6-month follow-up and minimal gains up to two years.<sup>4</sup>

This all is good evidence that we have made the correct decision and there is good evidence the outcomes will be successful. This surgery is commonplace. It is done frequently and with excellent short- and long-term results.

Yes- decision on need for hip replacement agreed. Now- Decisions on the surgeon? The hospital? Which procedure? What rehabilitation and where and with whom? Time? Costs? Work or not? How long will this all take? What if things don't go as expected? If I was not a PT would any patient ever question an orthopedic surgeon regarding an anterior versus posterior approach? What about robotic surgery? Some yes, but the majority no. Are we buying hospitals? Are we buying surgeons? Are we buying offices/systems that we like? We spend more time figuring out our smart phone services than our surgical/physician/hospital/payment packages. *Note: this is nuts! Medical service delivery has to change and give more information more freely. This is obvious and part of the medical reform and Obamacare.*

Decision done! My PT research and knowledge and experience and contacts kick in and we decide on anterior approach. One surgeon locally is pre-eminent in the procedure. Surgeon and anterior approach researched and decided. Hospital system accepts our insurance. Ok – almost there...

My husband was turning 65 years old in December and would be eligible for Medicare benefits. He is covered under my work insurance benefits of Florida Blue Cross Blue Shield, which is premier insurance coverage in the State of Florida. First simple question, "Would it be to our benefit to wait until my husband is covered under Medicare to schedule the THA surgery? He would still have Blue Cross Blue Shield but would also have Medicare as well? Does this make a difference?" Second simple question, "How much does the THA surgery cost?" You would not sign for any purchase without knowing at minimum an estimate of what the cost would be. Car dealerships are governed by law to give estimates before initiating services. The best information I was able to get prior to surgery was that Blue Cross Blue Shield would cover the hospitalization and surgery as per contract. I never got a number range of estimated costs. This is an issue beyond this article/blog/diary but it is an issue in our medical system that is broken and needs to be fixed. I did find that if I petitioned the insurance company they would give some cost information. Truly the paper-

work and data and time required was an enormous deterrent. The fact you don't have an estimate of costs prior to elective surgery is scary and a leap of faith to continue. However, we all put such grand faith in our personal healers, the surgeons, the hospitals, the nurses, the therapists, etc. we jump forward into the abyss of health care and hope.

In the end, despite not knowing exact costs, we scheduled the surgery with the surgeon pre-eminent in the procedure, the hospital well known in area with good reputation, and both physician and hospital take my insurance. (A medical trifecta or BTB this is how most people end up where they do for their medical care)

There is still one more step before the big day. My husband is scheduled for pre-op education session. This is excellent. In a group information session he is given a basic overview of the surgical procedure, hospital admission data needs, hospital processes, and progression. He is not given any pre-exercise routine or any information regarding home adaptation postsurgery. But overall, the session did help ameliorate the basic fears of the process and gave good information on the hospital admission criteria and process.

So now, we are at the hospital... next is the hospital experience from the caretaker patient perspective and this will be forthcoming in the second part of the series so the journey continues...

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# REHABILITATION OF A NONDISPLACED TIBIAL PLATEAU FRACTURE IN A 68-YEAR-OLD WOMAN

*Kerrie Steffan, PT; Suzanne Robben Brown, PT, PhD, MPH*

One in 3 individuals over age 65 will fall each year; 20% to 30% of these falls will result in moderate to severe injury, including fractures. Fractures are the most common, and the most costly, nonfatal injury accounting for 61% of total cost.<sup>1</sup> In the elderly, 8% of fractures are of the tibial plateau.<sup>2</sup> Fractures of the tibial plateau normally require surgical fixation and a lengthy period of rehabilitation to restore the patient to normal function. Fractures that are not surgically fixated are typically immobilized with external bracing. Rehabilitation is extended due to the need to keep immobilized patients nonweight bearing until sufficient healing of the bone has occurred.

Tibial plateau fractures are classified as either high energy or low energy and can occur from a variety of mechanisms. The classification of the fracture and the mechanism of injury as well as bone density are factors that determine whether surgical fixation or extended immobilization is required. The most common cause of tibial plateau fractures are falls on flexed knees and motor vehicle accidents with high velocity impact on the flexed knee.<sup>3</sup> High energy fractures are more common in the young with normal bone density and are surgically stabilized. Low energy fractures are common in the elderly with a high incidence of osteoporosis and osteopenia.<sup>4</sup>

Tibial plateau fractures, whether managed surgically or with immobilization, normally require extended physical therapy to restore mobility and function. Several sources are available on rehabilitation of patients who have undergone open reduction and internal fixation of tibial plateau fractures.<sup>5-7</sup> Limited information is available regarding the treatment of tibial plateau fractures not requiring surgical fixation managed with

immobilization only. The purpose of this case study is to describe the rehabilitation management of a patient with immobilization of a right tibial plateau fracture and the return to prior level of function. The International Classification of Function framework will be used as the theoretical framework to discuss the patient's impairment, limitations, and restrictions.<sup>8</sup>

## CASE DESCRIPTION

The patient is a 68-year-old woman who tripped on a rug and fell landing on a flexed knee. A T-shaped fracture of the right proximal tibia with the length extending into the intracondylar eminence was identified by x-ray imaging. The fracture was also identified to be comminuted, nondisplaced, and without compression. Bone density evaluation by DEXA scan revealed both osteopenia and osteoporosis, a contributing factor for low energy fractures. Past medical history included hypertension, which was controlled with medication. No other medical problems or history of any prior fractures. The patient was a Caucasian of small stature with a low body mass index which all contribute to osteoporosis. She was also not participating in a regular exercise routine prior to the fall.

The orthopedic surgeon elected to treat the fracture by immobilization with a hinged brace and nonweight bearing activity for 8 weeks at which time the hinged brace was discontinued. During this 8-week period, management of the patient consisted of nonweight bearing ambulation with axillary crutches, use of a brace that did not have range of motion (ROM) restrictions and no specific exercise. After 8 weeks, the patient was referred to physical therapy for progression to weight bearing as tolerated with no restriction on other activities.

## Impairments

After a full evaluation of her status by the physical therapist, impairments were identified including pain, limitation of right knee motion, and limitation in right lower extremity strength (Table 1). Pain was rated as a 4 on a 0-10 pain scale. Right knee ROM was 5° to 135° and the left knee 0° to 150°. Range of motion of the ankles and hip were within normal limits bilaterally.<sup>9</sup> Strength testing was performed as outlined by Kendall et al.<sup>10</sup> The right quadriceps and hamstrings were rated as 3+/5, hip abduction 4/5, hip external rotation and extension 4+/5. Left lower extremity strength testing was 5/5 in all muscle groups.

## Activity limitations

Activity limitations were identified using the Lower Extremity Functional Scale (LEFS). The LEFS is a reliable and valid assessment of lower extremity function following musculoskeletal injuries.<sup>11</sup> A change of 9 points is considered a minimal clinical difference. At the initial visit, her LEFS score was 50/80 indicating a moderate level of function. The major functional difficulty was unaided ambulation on all surfaces. The patient initially used axillary crutches with limited weight bearing on the right lower extremity.

The major activity restrictions were work related. The patient's administrative/management position required walking and personnel communication that was hampered by impaired gait and pain. Activities were also restricted by environmental factors for assisted transportation as well as restricted accessibility in the home, workplace, and community. She was motivated to return to normal activities and had emotional support from her spouse. Limited

knowledge of the conditions and the process of rehabilitation hampered both the patient and spouse.

## INTERVENTIONS

Goals established at the onset of treatment included full knee ROM, strength within one-half grade of opposite lower extremity, unimpaired gait without assistive device, return to normal work duties, and improvement in the LEFS by at least 10 points. A treatment plan was established to progress towards set goals. Initially the patient was seen for stretching, ROM, gait training, open chain strengthening, and establishing a home exercise program. Exercises were progressed to include closed chain strengthening and balance exercises. The patient's home exercise program was continually progressed as she tolerated more challenging exercise. Resistive exercises and a walking program were established at discharge from physical therapy. The patient was seen by physical therapy twice weekly 45 minute sessions for 6 weeks for a total of 12 visits.

A key component of her rehabilitation process was education. She was educated in the safe progression of activity and factors contributing to her fracture. She was also educated in falls prevention and home safety recommendations. The patient was not aware that she had osteoporosis prior to the injury. She was instructed in the importance of establishing an ongoing exercise program to increase bone density. Resistive exercises and a walking program were established upon discharge from physical therapy.

While patients who have undergone a surgical fixation of a tibial plateau frequently progress slowly with ROM and may in fact have long-term deficits, this patient progressed quickly with ROM. She had ROM of her right knee equal to that of the left within 2 weeks. Patients who undergo surgery are also more likely to have soft tissue injuries such as meniscal tears that impact treatment.<sup>12</sup> There were also no limitations regarding progression of ROM or weight-bearing restrictions as following surgical fixation. This allowed for a faster progression as tolerated by the patient.

## OUTCOMES

Range of motion was equal bilateral knees (0°-150°) and pain did not limit her activity. Lower extremity strength with manual muscle testing demon-

strated 5/5 for right lower extremities for all muscles tested. The goal for this patient was to ambulate on uneven surfaces without an assistive device which was met with the patient demonstrating an ability to ambulate over grass and up and down stairs with reciprocal gait pattern. Her LEFS score was 79/80 demonstrating a 29-point increase since initial evaluation.

Patient demonstrated no activity restrictions upon completion of physical therapy. She was able to perform all work-related job duties and no longer needed assistance with transportation. This was a return to prior level of function. She was compliant with her home exercise program. A phone call follow-up completed 6 months after discharge from physical therapy revealed that the patient was still compliant with her established exercise program.

## DISCUSSION

To date there has been little report of physical therapy treatment for patients sustaining a tibial plateau fracture who do not have surgical intervention. The purpose of this case study was to describe the successful rehabilitation of a patient in her 60s with a nonoperative tibial plateau fracture. In addition, a major contributing cause of the fracture was osteoporosis. Although hip fractures and spinal fractures are more commonly associated with osteoporosis and osteopenia, the tibial plateau is also susceptible to fracture.<sup>13</sup> Low energy fractures are commonly associated with osteoporosis. Because of this association, it has been recommended that all women between the ages of 55 and 75 who sustain a low energy fracture be screened for osteoporosis.<sup>14</sup>

Surgical fixation of fractures in osteoporotic bone can be difficult with non-union or malunion occurring.<sup>15</sup> The risk of this complication in addition to the type of fracture were likely factors contributing to nonoperative intervention.

A DEXA scan performed shortly after the fall diagnosed the patient with osteoporosis. Prior to this, the patient had a DEXA scan 10 years ago that demonstrated osteopenia. Insufficiency fractures of the tibial plateau occur more readily in osteoporotic bone.<sup>16</sup> Exercise has been demonstrated by a Cochrane review to provide a small, but statisti-

cally significant improvement in bone density.<sup>17</sup> The physical therapy treatment plan developed for this patient included weight-bearing exercises and establishment of a walking program for the patient to continue to promote increasing bone density. Education regarding risk factors for osteoporosis and ways to mitigate risk were provided to the patient.

The fact that this patient was active and still employed required that she be rehabilitated to a higher level than a patient who may not be as physically active. In addition, the patient had no other significant medical problems and no complications during her rehabilitation. She was motivated to participate with physical therapy and had a supportive spouse. These factors all contributed to a successful outcome.

This case demonstrates the effectiveness of physical therapy in the rehabilitation of a patient following a tibial plateau fracture not requiring surgical intervention. In addition, it highlights the importance of management of osteoporosis and the role of osteoporosis in insufficiency fractures of the tibial plateau.

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  - Shout and bang something
  - Press your emergency pendant
  - Use the telephone if you can
- Can I get comfortable?
  - Find a nearby pillow, cushion or rolled up item of clothing to put under your head
- Can I keep warm?
  - Cover yourself with clothing, a tablecloth or rug
- Can I keep moving?
  - Move position to avoid getting pressure sores
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# I LOVE THIS PROFESSION

*Jane Stroede, PTA*

I love this profession. I've had others, over my 50 years of working. Sales and marketing gave me an even playing field as a young woman in a male dominated profession. The question was "What's your gross?" not what's your gender. Don't get me wrong...it was mostly, if not all, men. They didn't want me there, but they wanted their share of my sales gross more...and if that didn't work, I'd remind them that I was somebody's daughter (and they usually had one of their own).

I found Physical Therapy at a time in my life when it was more important for me to have less money and more stability. I wanted to stay on my farm and raise my daughter as a 40+ financially independent single mother. This was a time when the VP of the USA bashed Murphy Brown and her story was my story. I used my marketing/business background and education to choose Physical Therapy. I've never looked back.

I found a profession where I could use my years of skill acquisition to create a career pathway for myself. I went about the business of stocking my quiver with arrows of interventions through continuing education, clinical experience, and professional activism. I worked for PTA licensure. I attended APTA/WPTA events and meetings. I served on the Physical Therapy Examination Board in every capacity, including Chair (with 3 PT members and 1 public member). I attended FSBPT conferences and training. I lobbied at annual events with legislators and I spoke for the board at legislative hearings. I worked with a new Program Director to start up a very successful PTA education program. I did all of this with ½ a vote as a PTA.

I'm not writing this today as a PTA. I'm writing this as an experienced entrepreneur, marketing/sales executive, rehab operational manager, and PTA program Instructor/ACCE. It is professional suicide to be voicing "global

health" and claiming altruistic desire for world peace while actively discriminating against your only other licensed physical therapy providers with an outdated and grossly ironic ½ vote per person. The confederacy is over. Stop this nonsense.

This is an incredibly smart profession with numbers of real rocket scientist minds in its membership. Many of my peers have left the professional association (and most of my past students won't join) due to this ingrained bias. Is it a supposed threat from assistants that is apparent in the establishment and continuation of the ½ vote for PTAs? I have remained loyal, paying my dues, promoting and advocating for change from within. Why? So that someday I could write this if need be.

It is time to stop discriminating against the size of the certificate. It is time to start recognizing the skills we each bring. I can run a meeting as a chair, hear an ethics complaint as a board member, recruit for the profession

as an instructor, present a CE course as an expert, and tell a PT what their hours will be & review their documentation for compliance as an operations manager without once encroaching on the scope of practice of my PT supervisor. No one reveres the lengthy and difficult education of the PT, like the limited to 5 semesters PTA. No one is more able to say, "The more I know...the more I realize I don't know" than the PTA. We are struggling to be your right hand, with a body of knowledge growing every day, and a profession that limits us by half. We're not the enemy to be limited and contained. We're the ones, more than any other that respects your work and this profession. We put shoulder to the wheel to keep it moving forward. Embrace us as equal human beings with one vote.

Respectfully submitted,  
Jane Stroede, PTA



Fancy Red Charisma, Sunny Stroede, Jane Stroede. Photo by Caryn Auer.

# LESSONS LEARNED FROM LIFE: PRESENTING JANE STROEDE, PTA, ACCE

*Interview by Michele Stanley, PT, DPT, GCS, CEEAA*

“I try to impress upon the students that we do not leave our 10, 20, 30, 40 etc. year old selves behind in life. That young girl/boy is in there when you are looking into the eyes of the 80-year-old. We are the summation of all of our experiences. Just as we learn principles of motor control involving environment/experience combined with feedback... there’s no limit or end to that learning in any of us. The human brain is dynamic with neuroplasticity that can be tapped at any age.” Jane Stroede, PTA, ACCE, and instructor for neurological rehabilitation, stresses to the students at Madison College (formerly Madison Area Technical College in Madison, WI) that their patient may not be Aaron Rodgers (the Green Bay Packer’s quarterback) but with every patient, there is a chance that it is his grandma or great uncle and deserves to be treated as if *they* were the star player.

Jane came late to the practice of physical therapy after a very successful career in business: marketing/sales in tourism, as an investment advisor, and finally as an employment and training manager. When she found herself in her 40s, single, with a young daughter and a small horse farm, she knew that she had to make changes. She states that she did a market study using her criteria for profession or career that would allow her to sleep at night, pay enough to allow her to raise her daughter in the rural life that she loves, and be present as a hands-on parent. Her previous career had required “a great deal of extra-long hours/travel/unscheduled activities that would have allowed me to pay someone to raise my daughter but not be always present.” Physical therapy came to the top of her market study. She applied at Western College in LaCrosse and prepared for the 2- to 3-year waiting list but moved

to the top of the list several months later (and on her birthday) when a vacancy occurred near the first day of school and the “first one to respond got in.” It was a sign she says! Although to the dismay of a young male classmate, she started to cry in her first week of classes (physics class) as she had an epiphany that “all my prior skills had brought me to this place.” Sales skills taught good listening, using open/closed probes to get information relates to how to help our patients see the benefits of PT. Even her life work training horses and dogs requires highly tuned observational skills and non-verbal communication, she relates. The slightest postural change in a horse means something and so it is with many of our non-verbal neurological patients, she explains. After graduation she found that finance skills helped her speak the language of third party payers and as an Operational Manager for Rehab, to bridge that gap between the numbers people looking for productivity and the hands-on patient care team looking for time and resources to help their patients.

After graduation, Jane intentionally worked in a variety of settings: skilled nursing, outpatient, acute care to “gather all the arrows for the quiver” that she felt would be needed for performing in her long-term objective job in rural home care. Advancing from staff PTA to Team Leader and then operations management, she states that her goal was to clear the way for our great team of therapists to deliver the very best physical therapy for every patient while meeting the financial needs of the company to be able to survive in the reimbursement pressured environment. One eye firmly on our patients and the other on the check book. It’s a reality. Denial or blaming doesn’t help. The financial people are just as invested in

caring about the patients as those of us in the clinic. They have family members, friends or even themselves receiving our services too...it’s up to us to speak their language and explain ours to make it all work. It can be done. Great physical therapy and fiduciary responsibility are not mutually exclusive. “I would still be happily doing Home Health, however, in 2010 I was contacted by Madison College and asked to join with a newly hired Program Director to start up their new PTA Education Program and I jumped at the chance to start at ground zero and build the program...primary in my mind was repaying the profession for the wonderful instructors that had given me the chance.”

When asked about her most noteworthy professional high point, Jane separates this into two dimensions: clinical practice and operations. In the clinic are the many individual patients that benefit from your own intention to find what works. Nothing like that in the world, she enthuses. Operationally, she ranks being respected by those that have been models and who placed her in positions of responsibility for the PT profession, recognizing her complete skill set, not reducing to the size of her certificate. Jane received the Wisconsin Physical Therapy Association *Outstanding PTA Award* in 2014 which combined both clinical practice and operations excellence. This culminated an appointment to the PT Board in Wisconsin as the first PTA when PTA licensing was passed in 2004. She served on the board in every capacity, including Chair and retired from the Board in 2014. It should be noted that when Jane graduated in 1995, Wisconsin did not have PTA licensure but Jane drove to Iowa to take the exam to demonstrate her commitment to the licensing process

and recognition that “PTAs are skilled professionals delivering safe, quality PT services under the direction of the physical therapist.”

So, what’s next? “I always liked the idea of the exponential factor in teaching...and envisioned sitting on my screen porch swing when retired, knowing that 100 pairs of hands were in the clinic treating 8 to 10 patients a day and so on! I still love that picture, and am working my way there. I’m a farmer. Love the horses and now very much enjoy watching my daughter take it to the next level. Sunny is now 23 years old and is a very accomplished equestrian. Having graduated college she is at home at our farm and showing her horse nationally as well as working full-time. When I can, I travel with her and never fail to meet the most interesting people

in the horse community! I’m a reader... of all kinds of material...you’ll find me on my screen porch swing sometime in approaching retirement...enjoying my latest read...knowing my past students are exponentially treating patients right that moment!”



Michele Stanley is a clinical education specialist for Evergreen Rehabilitation and staff physical therapist at St. Mary’s Hospital in Madison, WI. Dr.

Stanley has practiced in the areas of acute care, home health, skilled nursing, and private practice.

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# Academy Member Named as the 2016 McMillan Lecturer!

**Carole Lewis**, PT, DPT, PhD, MPA, GCS, GTC, CCOEE, MSG, FAPTA was announced and recognized as the 46th Mary McMillan Lecturer during the Honors and Awards Ceremony at the NEXT 2015 Conference in National Harbor, Maryland. She will present the lecture during the NEXT 2016 Conference June 8-11, 2016, in Nashville, Tennessee.

The Mary McMillan Lecture Award acknowledges and honors an APTA member who has made distinguished contributions to the physical therapy profession and we applaud Dr. Lewis on this excellent achievement and look forward to her lecture in June. Please plan to join us at NEXT 2016 in the Music City!



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