GeriNotes

Academy of Geriatric Physical Therapy

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TABLE OF CONTENTS

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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/Memoriam Fund is a wonderful expressive memorial.

PRESIDENT'S MESSAGE: MOVING FORWARD INTO 2015

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

I hope everyone is having a healthy and happy New Year. The first large change you will hopefully see is a new logo for the Academy. A logo is an entity's emblem that helps to define itself to others, both internally and externally. This was a difficult endeavor and Karleen Cordeau, PT, Public Relations Committee Chair, graciously led the way in getting this task accomplished. I want to personally thank Karleen for her efforts to get this finished. Her article in this issue of *GeriNotes* is worth the read to see what all went into this effort. The modernization of our name goes hand-in-hand with our name and image change. To inspire the logo design/change process, we needed to follow our mission statement and develop a new image for the Academy. The mission of the Academy of Geriatric Physical Therapy is to further our members' ability to provide best practice physical therapy and to advocate for optimal aging. We needed to stay true to our mission statement and ensure that our logo conveys the message we want it to. Another important aspect is making the logo stand out and be recognizable. We also wanted to remember the past, which is why the tree of life is still represented. A number of other organizations use varied images of the tree of life and we wanted our logo to stand out. The figure in the logo reminds us that we are a helping profession and patient centered. The large name on the top and the APTA name on the bottom reflect our association ties. We added a bit more color to modernize the design. Colors in advertising are important and convey a message of their own. Greens are typically used for environmentally-friendly or healthy companies, and we are certainly a health conscious organization. So here we are unveiling it in print for the first time!

We have a new Regional Course Committee Chair, welcome Linda Eargle, PT, DPT, CEEAA, and a new Home Study Editor, Katie Farrell, PT, DSc, who were both approved at CSM in Indianapolis. We have 3 CEEAA courses and locations set for 2015. Patti Brick, PT, MS, GCS, former New Jersey Chapter President, has been appointed as a Director-at-Large to the Board due to the vacancy that occurred when Danille Parker, PT, MPT, DPT, GCS, CEEAA, resigned. Thank you Danille, for your years of service to the Academy. The Member Meeting at CSM helped align our bylaws to the language in our Articles of Incorporation, which were revised after our name change last year. The Bylaws Task Force did an outstanding job of delving into all our bylaws for necessary revisions, something that had not been done in nearly a decade. I want to thank the Chair, Ann Medley, PT, PhD, CEEAA, and the rest of the Task Force including Greg Hartley, PT, DPT, GCS, CEEAA, Steven Chesbro, PT, DPT, EdD, GCS, Cathy Ciolek, PT, DPT, GCS, CEEAA, and Karen Curran, Executive Director, for their work. The Bylaw changes include the following concepts:

1. The Academy Bylaws were reviewed for consistency with the new Articles of Incorporation and consistency with current Academy practice.
2. Removal of a member of the BOD was added based upon the recommendation of an external reviewer of the Academy bylaws and to be consistent with rules for non-profit agencies incorporated in Virginia.
3. Article VII, Section 1: Directors were changed to Directors-at-Large to avoid confusion with the umbrella term "Directors."
4. A major addition to the Bylaws is a section on voting asynchronously. The language in Article VII, Section 6 is necessary to make us in compliance with Robert's Rules.

Some other people to thank for their service to the Academy are Ken Miller, PT, DPT, CEEAA – Nominating Committee Chair 2014-2015, Martha Acosta, PT, PhD, MS, GCS – Geriatric Specialty Chair 2013-2014, and Susan Wenker, PT, MS, GCS, CEEAA – Program Committee Co-Chair 2010-2015.

Thank you for your renewed membership! I look forward to serving the Academy and its membership in 2015. We are always looking for volunteers, just contact the Academy office to find a fit for you!

EDITOR'S MESSAGE: FUEL TO FIRE OUR PASSION FOR MOVEMENT

Meri Goehring, PT, PhD, GCS

This Editor's Message will probably find you longing for an early spring. It is not soon to come here in snowy Western Michigan, but regardless of the weather, this area of the country has many all-weather runners. I will admit, I am NOT a runner. But, I do value movement and prefer swimming, bicycling, and rowing to round out my year round movement plan. I recently came across an interesting research article that I thought I would share with the Geriatric Academy members, because it can provide us with even more evidence regarding how important it is to move. This study, done by Lee et al, and published in the *Journal of the American College of Cardiology* looked specifically at runners over a long period of time. In this study of 55,000 people with 15 years of follow-up, 13,000 runners were compared with 42,000 non-runners. The findings showed that runners had a 30% reduction in mortality and a 45% reduction in cardiovascular mortality, on average, with increases in life expectancy of 3 years for mortality and 4.1 years for cardiovascular mortality.[1]

I find those numbers to be very impressive. And, upon further reading of this research, it did not take a lot of running, only about 6 miles per week. Those who ran more did not have statistically significant changes. It did not take fast running either.

As I reflect upon the information, certainly, the runners were probably pretty fit to begin with. However, 6 miles a week at a relatively slow pace resulted in increased life expectancy and lower rates of mortality. Geriatric Academy members, we are familiar with educating our clients that it is never too late to start an exercise program. But how much do we know about dosing? This article reinforces that moderate exercise can have great benefits.

Sometimes, our clients tend to overdo exercise at first. Then they find they do not want to exercise anymore. Also, providing clear instructions that our clients will actually follow after receiving physical therapy can be very challenging and may not include an overall cardiovascular fitness program. Some of our clients have complex problems and should be monitored. Some of our clients rarely leave their homes, cannot afford to join a gym, and have not had much exercise for years. These are just a few of the barriers that we attempt to overcome as we help our clients to improve.

Certainly, there are many other well-written, evidence-based articles that support the need to encourage people to keep moving. But, this one really caught my attention, and may catch yours as well. It makes me proud of my profession, where we seek to transform society by optimizing movement to improve the human experience. The fountain of youth really is movement, and the physical therapy professionals in the Academy of Geriatric Physical Therapy are well positioned to assist our older adults to find the movement program that works best to improve their human experiences.

REFERENCE

1. Lee DC, Pate RR, Lavie CJ, Sui X, Church TS, Blair SN. Leisure-time running reduces all-cause and cardiovascular mortality risk. *J Am Coll Cardiol*. 2014;64:472-481.

Meri Goehring is an Assistant Professor in the Physical Therapy program at Grand Valley State University and works as a clinician at Spectrum Center for Acute Rehabilitation at Blodgett Hospital in Grand Rapids, Michigan.

WANTED: ARTICLES FOR GERINOTES

TOPICS:
Anything related to older adults

STUDENTS AT ANY LEVEL:
Send me papers you wrote for class

CLINICIANS:
Send me an article or an idea

EDUCATORS: Send me student papers

Everyone loves to publish and it is easy!
Contact Meri Goehring,
GeriNotes Editor,
at *goehrinm@gvsu.edu*

A NEW FACE FOLLOWS A NEW NAME

Karleen Cordeau, PT, MS, Public Relations Chair

The name change from the Section on Geriatrics to the Academy of Geriatric Physical Therapy last February was an exciting time. Now, we are excited to unveil our new logo as seen on this month's cover of *GeriNotes*. The AGPT President, Bill Staples also talks about our new logo in his President's Message.

Similar to the new APTA mission statement, "Transforming society by optimizing movement to improve the human experience," we have also undergone an evolution and transformation through our name change and now our new logo. Our logo using the tree of life has been in existence in one form or another since the Academy was formed in 1978. It is very typical to revise one's logo when an organization changes its name.

We asked, "Would the development of a new logo show advancement? Would it demonstrate art? Would it allow our members to be proud? Would it identify that we are visionaries? We felt that the answer to all of these questions was easy, YES."

Working closely with Lucy Jones, Director of Publications and Research, the first step was to find a designer. The AGPT sought out local designers as well as the world's #1 marketplace for custom logo design, web design, graphic design, industrial design, and writing services. This agency had over 123,000 creatives from 200 countries that receive the work proposal. We offered a summary for design modification, our mission statement, strategic goals, and values for inspiration in the designs. It was important that potential designers understood who we are. An ongoing tree symbol and the color green were mandatory in the designs. Trees and leaves are ubiquitous in the fabric of our lives. A tree symbolizes strength and courage. Leaves are recognized for their power to heal and renew strength and growth. This was the information that the designers were given for inspiration in their designs.

Our team worked together for the next 6 weeks looking at submission after submission. Every logo offering needed to be studied. Constant reminders of who were are, what AGPT stands for, and whom we serve was asked as each logo was viewed. Did it convey a vision of strength as we support our members and the patients/clients they serve, the public, and other health care professionals worldwide? When I personally reflect back on all of the logo offerings, the words that stood out in my mind from our goals were strength, support, health, wellness, fitness, positive, quality of life, and healthy aging. For those logos we thought were worthy of moving forward with, we went back to the designers and asked for specific changes. Of the 88 submissions we received, we were able to narrow the submissions to 9, which was not an easy task. They were presented to the Board and Committee Chairs for a vote in May to choose the top two picks. Once the top two logos were chosen, another vote was taken for the final logo design. The motion for approval was passed last June.

The AGPT is very proud to introduce this new logo to our members and the unveiling was celebrated during the CSM Member Meeting on February 5th in Indianapolis. You will be seeing our new logo on our website and all of our materials as we move forward into 2015. We want to thank Bill Staples, the Board of Directors, Committee and SIG Chairs, and Executive Director, Karen Curran who worked very hard during this process. We hope you will connect with the logo and what it symbolizes for you as the members we serve. In addition, promote the logo to the patients/clients you serve, the students you teach, and all others with whom you interact with on a daily basis. We would love to get your feedback on the new logo. Please email your comments to geriatrics@geriatricspt.org. Thank you!

Karleen Cordeau has been Chair of the Public Relations Committee for the AGPT since 2011 and has been in practice for 28 years in the field of geriatrics. She is a private consultant in practice, payment, policy, and business development and speaks regularly to companies and universities. She is Co-owner of The Center of Evidence, LLC, and VP of Corporate Sales for Great Seminars Online. She is Co-chair of the Practice Committee for the Connecticut Physical Therapy Association and is the liaison for National Government Services for her state. Karen can be reached at kcordeau@optonlin.net.

TUMMY TIME: RESTORING HARMONY IN THE COMPLEX OLDER ADULT

Rhonda Boeckman, PTA

INTRODUCTION

Many years ago, I fell in love with the geriatric patient. For 27 years, I worked in long-term care (LTC) with my attention and focus on fall prevention. Early on, I realized that a single fall could and would take away the life a patient once knew and catapult them into an unfamiliar, often lonely environment…the medical system.

My favorite part of working with older adults is listening to their adventures, their movement in this snapshot of time we call "life." Every conversation seems to have a common theme. Frequently, there are two areas of discussion; first their family and the second what they did for a living and/or throughout their life. I have met world-renowned inventors, artists, farmers, teachers, veterans (of almost any war in the last 100 years), athletes, entertainers, pastors, and government officials. Each conversation was a journey through their memories reliving their favorite times in their mind. Even though the physical body cannot carry out their dreams anymore, there is no limit when it comes to the heart and soul. The thoughts of the heart can at any moment navigate through time and space to rediscover each and every "movement" we have ever experienced.

When I started on this journey, I recall observing lap buddies, vest restraints, straps on beds, and other devices to reduce the risk of falls. Today, those "old" ideas of fall prevention seem barbaric. Twenty-five years ago, this manner of restraint for fall prevention was normal. At that time, few had stood up to say these particular devices were potentially diminishing a patient's quality of life and rights. It made sense that we put the lap buddy on the wheelchair, tied the vest, etc. This was the protocol for patients who were at a high risk of falling. This was done each time we completed our treatment with patients to prevent injuries from falls. The devices were not tight or uncomfortable for the patients. Rather, the devices served as a "pause" in a patient's movement as a reminder not to get up on their own. Even so, it was at this same time that I began to see it was the absence of movement, not the movement itself that led patients to fall. As time went on, I knew in my heart that it was my job to help patients who came to therapy to get "out of their box" and move.

When life begins, we are "restrained" in the womb with little space to stretch and feel our bodies react to the environment around us. In no time at all we are plunged into the world and begin our journey. In the beginning, we spend most of our time nestled in our parent's bosom or the safety of our cribs. In just a few short months, we are stretching outside of our safe fetal positions and experiencing and exploring the amazing phenomena, a new realm called "movement." Energy that had once been "restrained" is now being unleashed to experience the world around us. We begin to reach and extend farther into the world. Each and every gesture of movement that is performed we learn and respond in this new stage of life. Uninhibited motion teaching our mind and body to work together to catapult us into movement, energy, and most importantly balance to harmonize with the world in which we live.

From the womb, to the crib, crawling across a floor, walking down the hallways of our house, to running in the parks and playgrounds, our world expands dramatically introducing us to what seems like an infinite amount of movement that we experience with no boundaries in sight. We continue to grow into the world around us throughout our adult lives. All that we see and all we attempt to learn and do challenges our movement. Our bodies are in a constant state of change always striving for harmony. Our bodies continue to grow and adapt to the world. As we grow, it is movement that allows us to have more strength, more energy, and more balance to continue this fairytale journey where almost anything is possible.

For most of us, anything is possible with this amazing network we call a body. The movement of the human body has fascinated me. As we grow, our patterns of movement develop in similar ways. Even so, we have the tendency to develop and follow our own pattern or our own "journey" of movement. Whether it is dance, music, sports, etc, there is a particular pattern that we tune into throughout our lives that carries our movement in a certain direction. Even so, our movement must have a foundation. This foundation is what allows harmony. It is a place within ourselves that allows us to remain "centered." This center is what we search for to carry out all the functions required of this amazing detailed and miraculous network we call the physical body.

INTERVENTION

Rather than getting overly scientific in this article, I have chosen to reflect on common sense. The information in this article is evidence-based. Unfortunately, there is limited research on treatment programs for the complex older adult (COA). Most of the COAs we treat have multiple comorbidities and years of compensation and/or substitution tendencies. Because of this they have "misplaced" their original movement and ability to balance. Our responsibility is to help each patient rediscover this original movement pattern to bring light to the path of balance and overall physical harmony once again.

Years of observation and trial and error have led me to recognize the specific needs of the COA. The COA with the altered movement pattern (AMP) requires an individualized exercise program with focus on the weakest ar-

eas. Generalized programs do not work across the board with this population. Common sense reveals that compensatory patterns are not all the same. More times than I would like to count, I have observed multiple facilities using standard treatment protocols. Sadly, sitting exercises have become the primary activity of standard treatment observed in multiple facilities that require minimal skill or expertise. Isn't it obvious that sitting activities/exercises provide only limited movement in a confined space? We must ask ourselves if we are providing skilled therapy programs or restorative care that can be simply carried out by nursing staff or aides. Is it possible to see carryover in gait and balance when we perform sitting exercise regimes with our patients? My hope with this article is to inspire therapists to be more creative with treatments. We need to provide individualized treatment that fits the patient and avoid fitting the patient to the "standard" treatment regimes.

Before we move forward, we need to take a moment and reflect on a scientific concept. Newton's third law states that for every action there must be an equal and opposite reaction.[1] Beginning very early in life an infant will learn this law as he or she learns to roll, crawl, or walk each is applying a force which in turn causes a reaction. A balancing act in their muscles produces movement and facilitates something to happen. All the while, they search for harmony with every movement. All muscles from head to toe work together to achieve the right balance either to move their body or to keep it still and centered. As they learn to stand, you can see how the ankles, hips and arms are working back and forth to find the magical place we call the center of gravity. Equal and opposite forces, agonists and antagonists all doing their jobs to find that perfect balance that will allow us to stand-alone. This harmony continues for some time throughout our lives.

We must remember that most of the residents in LTC lived very active lives like you and me. Whether it is a disease process or natural aging that "shrinks" their world into a small space such as assisted living or long-term care, it is still part of their LIFE! It is a new chapter in which they can explore their movement in a safe and monitored environment. Newton's law is still at work as we see aging bodies attempt to do the same work to restore harmony. Unfortunately, the balance of strength and energy they had as a child is now gone. Muscle imbalances provide new challenges for the patient and the therapist. We need to help the COA recalibrate their movement patterns to restore harmony. It is our job to help them stretch, reach, and move to gain harmony once again.

Fall prevention has been researched from every angle. It is as if we have looked beyond the obvious. The patients we see are not only weak, but they have what is often referred to as AMPs.[2] Perhaps it is our fast paced world with too much to do and not enough time to do it that we have corralled our elderly into wheelchairs and assistive devices (AD). Instead of decreasing their movement, we need to increase their movement allowing them to experience the world around them. Falls in my opinion are the lack of movement that inhibits our appropriate responses leading to weakness, poor body awareness, and dormant balance systems that are underutilized due to restrictive environments.

I am thankful to have had the opportunity to observe multiple therapy treatments in a variety of LTC facilities over the past 27 years. This experience has helped me come to realize that the solution was not a simple one for the COA. Through multiple observations, it was noted quite often patients were unable to execute the activities/exercises with correct technique and alignment. The COA movement differed from the standard therapy patient. Though they did their best to complete the task, it was obvious that it was nearly impossible for them to do it without compensation or substitution. Therefore, the muscles we believe we are training may not be the muscles doing the actual work. Over a period of time as a patient continues to compensate or alter his or her pattern of movement, this will become the "normal" pattern. In other words, the brain learns a new pattern of movement that replaces the original. As they continue in this AMP, the stronger muscles get stronger and the weaker muscles get weaker.

Based on the aforementioned observations, I have seen two patterns of movement (Table 1) that appear to be quite common in the geriatric population in various settings. In each pattern, we will see alignment and stability problems of the pelvis/hip most often due to muscle imbalances of this area. The first is Movement Pattern 1 (MP1), commonly seen in the COA, who experiences long periods of sitting, poor posture, shuffling gait, and overall rigidity. This patient quite often develops a posture that resembles his or her favorite chair. In this patient we observe a limited change in the pelvis and spine when moving from sitting to standing. The focus in this pattern is to realign the pelvis in the sagittal plane. The posterior pelvic tilt is the area of focus in this pattern. This pattern requires exercises and activities that facilitate an anterior tilt to achieve a more neutral alignment. The patient with MP1 has poor awareness of the posterior aspect of the body. This leads to overutilization of hip flexor muscles and underutilization of hip extensor muscles. Gait reveals decreased step/stride length bilaterally with increased risk of retropulsion due to a posterior position of the center of gravity. However, this patient may also be prone to "tripping" due to a poor swing through phase.

The second pattern we see most often is called Movement Pattern 2 (MP2). This is most commonly identified by a "lurch" during ambulation. The trendelenberg sign is most often seen in this pattern due to the weak lateral hip muscles. This patient will sway side to side that leads to multiple changes including a trunk lean, leg length discrepancy, or ankle rotation to mention a few. A patient with MP2 generally will have

Table 1. Movement Pattern 1 and Movement Pattern 2

Movement Pattern 2	**Movement Pattern 2**
Rounded/Kyphosis	Postural Asymmetry
Posterior Pelvic Tilt	Lateral Pelvic Tilt
Pelvic Rigidity	Unequal Step Length
Shuffling gait	Trendelenberg

long-term unilateral pain, injury, and/or weakness. The focus is now on the pelvis in the frontal and transverse plane. The pelvis in MP2 will demonstrate lateral tilting as well as rotation or what is often called a pelvic obliquity. The MP2 patient demonstrates poor awareness of the weak side. This will lead to a decreased awareness of the weak side of the body and overutilization of the strong side with poor strength seen in the lateral and posterior pelvic/hip muscles. Patients often lose their balance laterally due to either the Trendelenburg (causing the unaffected lower extremity to adduct in swing thru resulting in a narrow base of support) and/or what I have termed an "overshift" as they avoid weight bearing on the weak side and quickly propel themselves back to the strong extremity.

For the past 3 years, I have chosen to focus on the gluteal muscles of the pelvic/hip area. The gluteals play a major role in the balance and harmony of the body. More specifically the gluteus medius (GM) and gluteus minimus (GMin) muscles are key components in both MP1 and MP2. In both patterns, patients demonstrate an inability to find and/or maintain "center of gravity." This imaginary area is really the center of "all forces" equally reacting to each other. Obviously, in our COA we see multiple muscle imbalances. Where do we start? Until I began to focus primarily on the realignment of the pelvis, fall prevention was ineffective. Looking more closely at the pelvic/hip muscles revealed the secret to successful fall prevention in the COA.

INFORMAL OBSERVATIONAL STUDY (IOS)

To further demonstrate the need for gluteal strengthening in the COA, I was led to perform an informal observational study. Twenty residents of two assisted living facilities were observed performing 3 lower extremity movements; sit-to-stand activities and unilateral stance activities. The above tasks were chosen because they are the movements that repeatedly produce compensation in many of my patients now and in the past 27 years. All three activities will challenge the gluteal muscles of the pelvic/hip area.

TESTING

For testing strength, I chose the supine straight leg raise, sidelying hip abduction, and prone (with 2 pillows under the lower abdominal area) hip extension. The goal for this was to demonstrate the muscle imbalance between the anterior hip/lower extremity muscles to the lateral and posterior muscles. It is my experience that patients tend to rely on the anterior groups, primarily the hip flexors to get them from one place to another. If a patient has a forward flexed posture, it is very likely they lack lateral and posterior hip strength. This holds true almost always with patients that use a front wheeled walker (FWW) and 4-wheeled walker (4WW) for mobility. The shuffling gait requires minimal weight shift leading to an incomplete gait cycle. Thereby, without appropriate weight-shift and minimal stance phase the lateral and posterior hip muscles become "dormant." We spend more time in stance phase compared to swing phase. Therefore, if patients spend little time in this important phase we can begin to understand how extension of the hip and knee as well as appropriate use of the GM for pelvic stability is compromised.

The single leg stance (SLS) is always a difficult test to perform for the COA. Most are unable to begin to lift even one or the other foot from the floor. It is very difficult for patients with weight-shifting limitations to sustain this position longer than 3 seconds. It is rare to find a COA that can perform this without compensation. Often times, due to a weak GM the trendelendberg sign becomes very obvious in this simple task. This is a key observation to underlying problems of pelvic instability in gait and balance.

The final test of sit to stand required the residents to rise from a chair of standard height without the use of upper extremities. In the COA, they maximize the use of their upper body to assist them to get out of a chair. To complete the task, patients will reach for the AD and will again use the upper extremities for pushing themselves into an erect position.

Residents were tested on a pass/fail basis to allow for simplicity when summarizing the results. This is not a scientific study by any means. Nevertheless, it certainly is the reality that many of us face each and every day. As I review research studies, there is a definite need for information and research on the COA. Many of the studies I have reviewed have included older adults that clearly are functional with little to no compensatory patterns and/or considered community dwellers.

RESULTS

Overall, the results reveal without a doubt that the anterior aspect is much stronger than the posterior aspect and/or lateral aspect of the hip. Therefore, common sense tells us that we have severe muscle imbalances that need to be corrected. Additionally, we can see how the pelvis may move out of alignment increasing the tendency to substitute or compensate. This leads to a multitude of postural changes as the patient struggles to remain upright and keep her center of gravity.

Looking at the results, are we really surprised that our patients are experiencing falls? Are we doing what we can do to "balance" the muscular system to allow the COA to have the available movement needed for gait and balance? As you can see from Table 2 most failed the sit to stand and the SLS. Only one out of 20 participants passed all 3 tests.

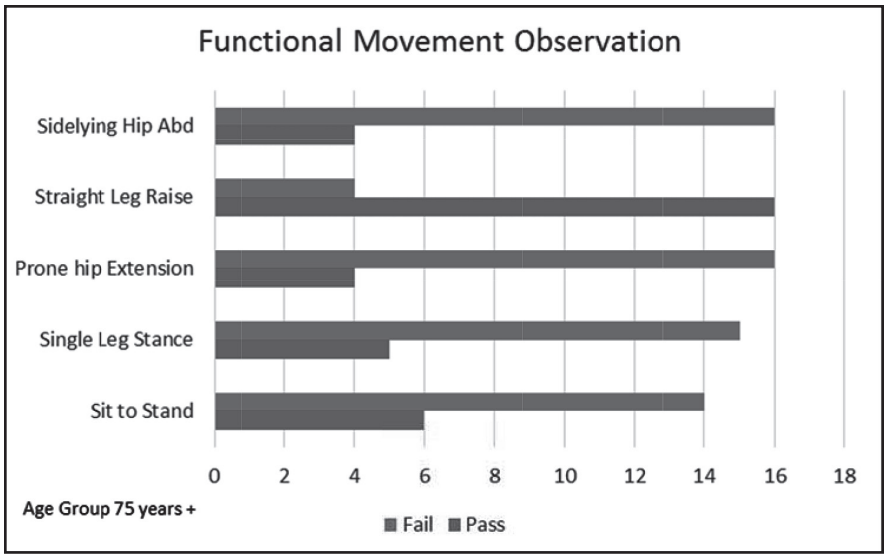
CONCLUSION FOR IOS

My conclusion from this study is once again falling back on common sense. Muscles that are used maintain their strength and muscles that are not used continue to weaken. What may have been a minor weakness at an earlier age can and will grow into a larger problem as we grow older. A good example of this would be those with total knee replacements (TKAs). Surgeons like to wait until it is absolutely necessary to replace the joint. The risk of compensation leading to an AMP increases as the surgery is postponed. This may lead to ankle rigidity, hip/pelvic weakness and dysfunction, low back or sacroiliac pain, core weakness, and trunk deviations to name a few. It is easy to see that an AMP coupled with a sedentary lifestyle in a limited environment leads to muscular imbalance and asymmetrical dysfunction that can and will lead to falls. Many times in our treatments of individuals with TKAs, we are strengthening the hips particularly the opposite one, due to weakness that developed from the AMP.

TREATMENT FOR COMPLEX OLDER ADULTS

Treatment in the COAs is not simple. Given enough time, AMPs become

Table 2. Results of Informal Observational Study. Reveals the Need for Posterior/ Lateral Strengthening of the Hip



"normal" for the patient. The patient's "view" of her movement is distorted. The brain will learn and adapt to whatever movement we are doing most often. There is an old saying that states, "You are what you eat." I inform patients, "You are how you move." We need to search out the patient's weakest areas and target them for overall stability.

My personal plan of attack is to isolate, facilitate, and calibrate. Manual muscle testing in sidelying and prone will provide clear-cut objective information that supports why skilled care is needed. As you can see by the IOS, there is a significant difference between the anterior strength compared to the lateral and posterior strength of the residents. We test the GM by abducting in a sidelying position. This position will give you a better assessment of pelvic stability both for gait and postural stability. I will discourage therapists to test hip muscles in sitting. This has become quite popular in order to "save time." However, testing this way does not reveal pelvic positioning, stability, or accurate strength through full range of motion against gravity. Most often physical therapists and physical therapist assistants are testing isometric strength in a gravity-eliminated position. This is the opposite of what our muscles are truly doing when performing dynamic activities such as in ambulation in activities of daily living. The plan of care will be focused specifically on the weakest muscles. We already know the patient is using the stronger muscles throughout the day. We need to use our time with the patient working specifically on the weaker muscles or movements that are most challenging for them.

In the initial treatments, it is important to teach the patient to isolate the muscle and avoid substituting or compensation. Once the patient can do this, we facilitate the muscle to move with the normal pattern being aware of compensatory tendencies. Finally, the patient learns to calibrate the movement of a specific muscle with slow dynamic activities. Many times a patient will have a tendency to use momentum as a way to complete movements. Low repetitions and slow sustained movements will allow for immediate strengthening and less substitution. At this point, the pattern needs to be repeated over and over in order for the brain to find the original "map" of movement and to override the compensatory pattern. Both patterns will be available to the patient. Patients have to choose which one to use and this will be difficult for them. The compensatory pattern is the most familiar and it will be difficult for them to switch and use the new pattern. With daily practice, using caregivers and others to reinforce the new pattern, patients can and will learn to move more safely in their environment.

The Prone to Foam program has been the most popular aspect of my continuing education course this year. The primary focus is using *gravity* to our advantage reversing the symptoms of the MP1 and MP2 of the COA. Prone positioning allows for gravity assisted pelvic movement. It is gentle, relaxing for the patient, and proven to be safe. This is what we call our "***tummy time***" for the geriatric patient. Tummy time is often recommended in infants to encourage extension strength. This activity assists in preparation for the strength

Figure 1. The steps used to ease patient into Tummy Time for prone exercises/activities. Patients may assume prone on elbows if there is no indication of pain. This will allow mild lengthening of anterior muscle groups. Prone exercises are performed in resting position not prone on elbows. Initially, hot moist packs and massage will provide for additional comfort in this position and increase awareness of the posterior aspect of her body.

and movement that will be needed in rolling, crawling, and walking. We begin with the prone position for only 2 to 3 minutes. Often times we ease the patient's anxiety about the position with a gentle massage to the lower back and sacral region in the first few treatments. Massage is a great adjunct to this as it encourages muscle relaxation, which can assist in pelvic movement. Every 2 to 3 treatments of prone, we will add another 1 to 2 minutes. We make it a practice to never exceed 10 minutes in this position to prevent stress to the lower back. It is a wonderful position to add gluteal strengthening (Table 3), extensor awareness, and remove substitution tendencies that are often seen in supine or sitting exercises. It reveals the "true" picture of the abilities of the posterior aspect of the body. Recently, we introduced "tummy time" for patients with total hip arthroplasty (THA). Supine exercises move the greater trochanter posteriorly. We aim to balance this with prone exercises with the hope to allow for a neutral position of the hip and pelvis allowing for increased stability and decreased risk for dislocation.

We have treated COAs with both MP1 and MP2. The posterior pelvic tilt is often due to prolonged sitting in both patterns. Sitting in recliners and wheelchairs is the primary activity in long-term care. As the head is pulled down by gravity, the pelvis must adapt to allow for balance. This population of older adults experience rigidity throughout particularly in the pelvis and low back resulting in shortened posterior lower extremity muscles from the ankle to the hip. This can lead to retropulsion or falling backward. Backward disequilibrium is abnormal postural behavior.[3] The goal for "tummy time" or prone positioning is to help our patients find their center of gravity through a more neutral pelvis. A neutral pelvis opens the door to improved use of the posterior and lateral hip muscles due to proper alignment. Extensor muscles of the back and hip will be available and ready to be used for transfers, gait and righting responses.

Following the prone exercises, we turn the patient to her side. Now with a pelvis that is aligned we can properly use the lateral hip muscles. Current research is calling the GM and GMin the "rotator cuff of the hip."[4] Small tears in the GM and GMin are being discovered.[5] There have been several studies and growing reports of new surgical repairs being performed. I encourage all therapists to take a closer look at the GM. Repeatedly, it has proven to be the key to balance and stability restoration in our COAs. In our treatments, we focus on posterior and lateral strength hip muscles to help us move the pelvis to neutral and provide balance. Multiple exercises have been developed to strengthen the lateral hip muscles.[6] Unfortunately, in the COA, most of the exercises cannot be performed with appropriate technique. Sidelying abduction has been the best way for us to isolate and strengthen the GM with manual support to help stabilize the pelvis and eliminate substitution by the hip flexors. We avoid single leg supine abduction, as it tends to open the door to substitution. Complex older adults with weak GMs will externally rotate the hip and use hip flexors to move the extremity. Often times you will see this in the gait pattern. Some patients will externally rotate the strong lower extremity to use the toes to prevent from falling to this side when they over-shift from decreased stance time on the weak side.

Prone positioning is a great way to see the strength and abilities of some of the largest muscles on the body. The strength of the GM is primarily seen in sidelying abduction. However, in the prone position, the strength of the anterior and posterior fibers as well as the GMin strength can be seen in prone. We use bilateral knee flexion and ask the patient to externally and internally rotate (feet together/feet apart). More often than not, the patient is unable to perform this activity/exercise. This movement along with the sidelying abduction reveals the "true" picture of the overall strength of the "rotator cuff" of the hip. If patients cannot perform these while lying down in isolated positions, it is apparent they will be unable to use them in dynamic situations.

Next, we will look at the "foam" aspect of the exercises of the program. Approximately 6 years ago, I decided to discontinue with standing exercises for balance in the parallel bars. The Complex older adult has the tendency to grab for an object for stability instead of relying on her own righting responses. It is our job to help the patient bring her balance system out of a "dormant" state. Financial cutbacks continue to plague our profession. We must find ways to get long-term results in a short amount of time. Because of this, we began to introduce the patient to a semi-firm foam mat in the first or second treatment.

Table 3. Gluteal Strengthening in Prone to Foam Exercise Program Prone with 2 Thick Pillows Minimum (Do Not use Bolsters)

Prone
Gluteal Squeeze
Knee Flexion single and alternating
Gentle Manual Hip Flexor Lengthening
Isometric Hip Extension
Assisted Hip Extension (through available range only)
Knee Flexion with Internal/External Rotation
Shoulder Extension
Scapular Adduction
Gentle Active Cervical Extension (if range is available)
Sidelying:_____
Hip Abduction with pelvis neutral
Clam
Hip Extension (knee extended) with Powderboard
Reverse Clam

This is a wonderful opportunity for patients to "feel" their bodies move outside their "regular" every day activities. No ADs are used throughout treatment. Instead of ADs, I encourage therapists to stand close to the patient with contact-guard initially, then moving to stand-by assist. The patient needs to understand that by using the balance systems she will prevent losing her balance systems. Allowing the patient to grasp an object should be the last resort when practicing balance activities. On the foam, the body will be challenged and the balance systems will begin to awaken from the dormant state. Using bilateral heel cord stretching, wide base stance, narrow base stance, tandem and half-tandem positions, and SLS in both static positioning and eventually dynamic activities facilitates the use of righting responses. We find as patients learn stability on the mat it enhances stability off the mat. With each activity on the mat, we have the patient stand for up to one minute to allow righting responses, self-correction of posture, and muscle lengthening. Prone exercise prior to foam exercise will facilitate extensor use, postural positioning, and awareness. When gravity is allowed to assist in repositioning the pelvis in prone, the patient has a greater opportunity to find her COG with appropriate posture and muscle support in standing.

We end our prone to foam treatments with gait training. Now with pelvic alignment, hip muscles readily available, and balance systems awakened, we can truly provide gait training! As the COA's body begins to "open" and stretch, we need to be sure she uses this new movement when she ambulates. Our goal is to lengthen the step/stride to facilitate extension. Short steps will "close" the patient again. If they use an AD, we need to teach the patient to avoid leaning on the AD. Leaning on the AD increases the work in the upper body and decreases the work in the lower body. We must teach the patient, family, and caregivers the importance of proper gait to ensure as much carryover of strength and flexibility as possible. Caregiver education in the treatment of the COA is necessary. Caregivers tend to provide too much assistance. It is important for caregivers to understand that the more they do for the patient, the less movement the patient will have. We are back to common sense…less movement…less strength…and the story continues.

For this article, I chose not to focus on the vestibular, visual, and proprioceptive contributions to balance and stability. Each of the aforementioned systems is just as important as the strength of the musculoskeletal system. They work together to help our patients restore safety, balance, and most importantly, harmony to their activities of daily living. There is a multitude of balance programs that have been developed. Each one contributes wonderful information in the overall problem with falls in the elderly. No matter which program you decide is right for you and your patients be sure of one thing—our patients must have the tools they need to generate movement. These valuable tools are our muscles. My hope is you will discover as I did, begin with the pelvic/hip alignment and global strengthening of this area will enhance balance and fall prevention programs immensely.

My prayer as a PTA and recently as a Pastor is that I may continue to reach out to others and continue to teach them how to get "out of the box." Whether it is our physical problems or our everyday challenges in life we are called to MOVE. We can teach our patients to extend their MOVEMENT beyond what they can imagine both spiritually and physically. They will develop a new pattern that will give them a stable foundation and restore harmony and hope to their lives.

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ANTERIOR TOTAL HIP ARTHROPLASTY: REHABILITATION MEETS THE SURGICAL ADVANCES

Alisa Curry, PT, DPT, GTC

While posterior total hip arthroplasty has been the more commonly performed replacement procedure by orthopedic joint arthroplasty surgeons, the anterior approach total hip arthroplasty (ATHA) is becoming more prevalent and invites the potential for advancing physical therapy interventions. We should be accountable for familiarity with surgical interventions. While the tissues still require the same amount of healing time with both types of surgery, we also recognize that there is the opportunity to help advance these patients faster, but safely, towards functional independence due to decreased trauma and the anterior surgical approach.

THE ANATOMY OF THE HIP

The hip complex consists of the femur, acetabulum, and the labrum around the rim. The blood supply to the femoral head is the medial femoral circumflex artery. This supplies the ligamentum teres or round ligament, which connects the head to the acetabular cup. Nerves supplying the hip include the sciatic, superior gluteal, and inferior gluteal. The ball and socket joint allows for the following range of motion norms (Figure 1).

CAUSES OF ARTHRITIS[1,2]

There are numerous forms of arthritis; however, osteoarthritis and rheumatoid arthritis are the most prevalent.

Range of Motion Norms	
Hyperextension	30°
Flexion	100°
Adduction	20°
Abduction	40°
External Rotation	60-90°
Internal Rotation	40°

Figure 1. Hip Range of Motion Norms

Osteoarthritis can cause joint degeneration over time or be accelerated due to traumatic injury causing degenerative changes of the joint surfaces over time. Patients can also experience congenital hip dysplasia, in which the head of the femur is not completely seated in the cup at birth and the hip develops in a maligned position as the patient ages. Rheumatoid arthritis is an inflammatory disorder in which the body's immune system attacks itself. This causes breakdown of the joint surfaces, pain, and restricted movement in multiple joints of the body. Disruption or injury of the blood supply to the femoral head is a condition known as avascular necrosis.[3,4] It leads to bone death and potentially a collapse of the femoral head.

SURGICAL INTERVENTION

Anterior total hip arthroplasty (THA) was first performed by Robert Judet in France in 1947 and brought to the United States by Joel Matta, MD, in 1996. Described by Dr. Matta,[5] "the muscle dissection during surgical intervention involves lifting the fascia lata off the medial portion of the tensor and following the interval medial to the tensor in a posterior and proximal direction. Dissection by feel is most efficient at this point and the lateral hip capsule can be easily palpated just distal to the anterior inferior iliac spine. [They] place a cobra retractor along the lateral hip capsule to retract the tensor and gluteus minimus laterally and retract the sartorius and rectus femorus muscles medially with a Hibbs retractor. The reflected head of the rectus that follows the lateral acetabular rim will be visible. A small periosteal elevator placed just distal to the reflected head and directed medial and distal elevates the iliopsoas and rectus femorus muscles from the anterior capsule." In an article by Bergin et al,[6] it was noted that from a basis of inflammation and muscle damage, the ATHA approach caused less trauma than the posterior approach. This is, of course, physician dependent, however, potentially a more objective measure of surgical effects. The potential surgical complications associated with ATHA are the same as the posterior approach--fracture, dislocation, leg length discrepancy, femoral nerve neurapraxia, deep vein thrombosis, numbness, and loosening. There are a few articles that reflect the "learning curve" that goes along performing this approach.[7] Any of these complications can lead to weight bearing restrictions, increased pain, slower recovery, and potential need for transfer to a secondary level of care in the rehabilitation phase. Restrepo et al[8] did a prospective randomized study comparing anterior and lateral surgical approaches. The results of the study showed that while long-term results show no significant differences, short-term outcomes show that patients advanced quicker with the ATHA approach.

REHABILITATION AFTER ANTERIOR THA AND LENGTH OF STAY

The posterior approach total hip arthroplasty (PTHA) through the gluteus maximus/tensor fascia lata junction requires incision through the joint capsule, which is then repaired after the components are placed. This structure provides support to the hip complex until the posterior musculature heals. Because the motions of dislocation of the PTHA are functional postures (flexion greater than 90°, crossing the knees past midline and hip internal rotation), these are restricted until the tissue has healed. The ATHA allows the surgeon to approach and repair the hip capsule in a less used functional position and allows patients less restricted movements. With the advent of smaller incision (MIS) ATHA and patient selection, patients have decreased muscle trauma, decreased

blood loss, and may be ready to mobilize sooner. Establishing patient expectations helps to set an expected course of treatment, eliminate indecision and move patients along the continuum of care with the interprofessional team.[9,10] Yeung et al in Canada describes increases in length of stay [with ATHA] can be attributed to admission FIM, female sex, revision of only the femoral component, prior surgeries in the lower extremities and redo hip revision are all independent factors associated with 4 to 6 days longer length of stay.[11] Another study reported patients with direct anterior approach had lower pain scores, walked stairs faster functionally, and walked without assistive devices sooner in the earlier postoperative phase than those patients with posterolateral approaches.[12] Assessment of the femoral nerve function is most important before ambulation of these patients. The femoral nerve directly controls the quadriceps. Any neurapraxia of the femoral nerve can place the patient at risk for falling or buckling, which can subside the implant in the femoral canal. Good assessment of muscle control is critical in all cases.

GROUP DYNAMIC–PREOPERATIVE EDUCATION AND GROUP EXERCISE

Studies done on preoperative education[13,14] illustrate that, while not impacting length of stay, ambulation distance, pain level, or complication rate, does give patients confidence in the process of surgery and the treatment staff. Programs must decide the benefits of investing time and expertise before surgery through preoperative education with the effect of outcomes. Patient satisfaction is higher and presurgical anxiety is lower. A Cochrane Summary on preoperative education stated that there is Silver level evidence that education may have a positive effect on anxiety and be beneficial for those who do not move well or who do not have support.[15] In addition, group exercise classes may help to facilitate following their home exercise program.[16] These aspects can be integrated into the clinical pathway to develop a supportive environment for patients in the acute care setting. In addition, this gives the interprofessional team initial exposure--a "first glance"--at patients who may have social barriers impacting their overall recovery and allow for earlier interventions with case management, family, and therapies for outcomes. Information gathering at this juncture is more helpful in planning for discharge.

PAIN MANAGEMENT

Effective pain management helps the patient to tolerate the increased level of activity. Pain management is a multi-tiered approach that begins in the operating room with anesthesia and continues through to the patient care unit with nursing.[17] Based upon evidence and clinical practice, there are several principles of analgesic management to meet the objective of preventing moderate to severe pain[18] (Figure 2).

By advocating for our patients to manage pain in this manner, we help them to gain a foothold in the pain cycle that allows our rehab interventions. Effective pain management is a multidisciplinary team goal that happens with medication, movement, edema management, and education. With the less invasive approach for ATHA, the goal is the minimize tissue disruption and therefore decrease limitations. Therapists will note that if pain is managed better, patients are able to be more functional. While the surgical procedure may not cause much pain, patients relying on opioid medications preoperatively may have a higher pain complaint due to acclimation to usage. They can present with spasm and cramping and may benefit from interventions such as cryotherapy and massage or even non-narcotic medications to control the symptoms.

HOSPITAL LENGTH OF STAY

Length of stay can be as short as overnight, even moving towards same day surgery.[19] Safe discharge of patients in a short length of time requires a coordinated effort. It helps to educate them in advance and set expectations. In acute care physical therapy, therapists must modify the treatment plan to manage the symptoms of the acute postoperative patient, educate the patient on the body's healing process, and integrate functional movement that helps facilitate independence with the patient with ATHA. Focus on repetitive exercises alone may increase the amount of pain a patient experiences and immediately postop, may not be the best focal point. Management of acute inflammation including modalities such as cryotherapy, gentle stretching, and functional mobility will help to improve patient function. Postoperative precautions are considered unnecessary by some surgeons due to the functional advantage of the ATHA. Many patients can comfortably perform forward bending and hip flexion, which does not stress the surgical repair. Positions to avoid due to the surgical compromise are hip hyperextension with external rotation.[20] This allows continued healing of the anterior structures, which provides hip stability. Regardless of the surgical approach, it is important for clinicians and patients to know when to safely and properly advance the patient's activity level. Stability after THA should include postural assessment and correction of soft tissue imbalances. Early post

1. When continuous pain is anticipated, a fixed-dose schedule (around the clock) should be used.
2. A PRN order of a rapid onset analgesic may be necessary to control activity-related (breakthrough) pain.
3. To ensure opioids are safely administered, begin with a low dose and titrate to comfort.
4. Modification in analgesic administration is based upon assessment of the effect of the previous dose, including change in pain intensity, relief, and side effects experienced.
5. Patients respond differently to various opioid and nonopioid analgesics; therefore, if one drug is not providing adequate pain relief, another in the same class may result in better pain control.
6. Assessment of effect should be based upon the onset of action of the drug administered; for example, IV opioids are reassessed in 15 to 30 minutes, whereas oral opioids and nonopioids are reassessed 45 to 60 minutes after administration.

Figure 2. Recommendations for Pain Medication Administration

op focus should be on flexibility and stretching of the lateral muscles for a balanced pelvis. Lateral musculature of the hip can be overdeveloped with gait deviations and patients can present with a lateral lean towards the affected hip preoperatively during gait. This can cause muscle tightness. Physical conditions that can be miscalculated intraoperatively and lead to leg length discrepancy are pelvic obliquity, spinal deformity, and knee flexion contracture. These conditions can also be addressed (though not always completely corrected) through physical therapy interventions. External modifications (shoe lifts) should not be added right away. After surgery, we need to meet the advanced functional needs of these patients while making sure they allow healing of the soft tissues. We know that ligament and muscle healing times take approximately 6 weeks for the type 1 collagen formation.[21] Capsular repair gives stability to the hip joint so we need to avoid stretching these anterior structures. Some surgeons will tell patients there are no restrictions on motion; however, therapists should still consider what functional activities a patient might do to stress the incision and internal tissues. From a treatment standpoint, this means that the acute care therapist may be able to mobilize the patient sooner and farther in the hospital. The patient that may have been discharged from the hospital previously with a front wheeled walker might actually be ready for a single point cane, one crutch, or two crutches.

HOME HEALTH CARE PHYSICAL THERAPY

Home health physical therapy should focus on safety in the home setting, where patients tend to be more mobile and pay less attention to safety and precautions. Functional movement that may place the patient at risk for injury includes reaching upper cabinets while the hip is extended back turning the affected leg out, loss of balance and falls. The home exercises should include hip flexion and abduction/adduction. At 2 weeks, early signs of bone growth to the implant can be noted. The ligament capsule has type III collagen formation, the initial fibrosis. Preventing disruption of the bony ingrowth or the ligament capsule insure implant stability. Patients should still be educated as to potential injury from falls, stumbling or loss of balance so caution should still be exercised. The patient should work with her physical therapist to transition down on assistive devices sooner than some patients with posterior approach THA. These patients will be more likely to drive sooner, and return to household activities (laundry, feeding pets, cooking, gardening) so the home health therapist should be thinking ahead of the patient to help them plan their tasks safely. These skills should be addressed in the home health, potentially as soon as the first visit. The surgeon should decide how quickly to advance the patient on return to sporting activities. Outpatient physical therapy may not be required unless there are other physical conditions or co-morbidities, which prevent complete recovery but can be initiated at the surgeon's discretion.

TESTS AND MEASURES[22]

Standardized tests applicable to this patient population include the following:

1. Harris Hip Score[23] is a 100 point assessment by which the clinician measures the patient's pain, ROM, physical function, and self-care. This can be assessed preoperatively and postoperatively at intervals and the results compared to show progress. A score below 70 indicates poor function, 70-79: Fair, 80-89: Good, and 90-100: Excellent.
2. Patient completed tests include the Oxford Hip Score,[24] Hip Disability and Osteoarthritis Outcome Score,[25] and the Western Ontario and McMaster University Osteoarthritis Index (WOMAC)[26] to rate the impact of osteoarthritis.
3. Balance and gait tests[27] applicable to this patient population with hip involvement include Tinetti, Berg Balance, Timed Up and Go, Dynamic Gait Index, and the 10 Meter Walk.

CONCLUSION

Physical therapists may find that patients with ATHA will progress faster functionally than patients with PTHA due to less pain and less restrictions. It is our responsibility to keep up with the advances and techniques being implemented in the surgical community. The ATHA approach gives patients the advantage of minimal trauma by using a smaller incision, and by being performed in a position that minimizes postoperative restrictions and allows patients to bear weight normally. By working to prepare patients with education preoperatively, patients will know how safely they can move through their recovery. We need to educate them that while their functional mobility early on will be good, there is a chance, however slight, of complications. We, as the physical function experts, can advance these patients on low impact activities, such as walking and stretching in the initial 6-week healing period. According to experts, proper patient selection plays a large role in preventing potential intraoperative complications such as fractures and dislocations; however, studies indicate that this may primarily occur early on in the surgeon's total number of cases.[28] We need to continue to accelerate our rehabilitation protocols to safely meet these rapidly functional patients at the junction between healing and mobility.

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PARKINSON'S DISEASE: AUDITORY OR VISUAL CUEING AND GAIT A CURRENT REVIEW OF THE LITERATURE

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INTRODUCTION

Parkinson's disease (PD) is a neurological disorder that is becoming an increasingly common disease among older adults.[1] Parkinson's disease results from degeneration of the dopamine producing cells in the substantia nigra compacta area of the brain.[2] The decrease in dopamine results in movement abnormalities such as tremor at rest, rigidity, bradykinesia, postural instability, flexed posture, and freezing episodes.[2] Abnormalities often result in more falls that can cause serious injury and pose great health risks, especially to the elderly.[1] The reduction of common movement abnormalities may result in decreased risk of adverse events and increased quality of life.

LITERATURE REVIEW

Physical therapy is often used to assist individuals with PD to prevent falls and preserve function.[1] The most common physical therapy interventions for individuals with PD include exercise for strength and endurance training, treadmill training, gait training with cues, dance, and martial arts.[3] Participants with PD that underwent weekly physical therapy interventions for a year demonstrated reduced falls at one year follow-up (53% without falls compared to 20% at baseline). When the same participants continued with bi-weekly physical therapy interventions for a second year, the 2 year follow-up discovered that although there was a statistically significant reduction of falls since baseline, more falls had occurred since the previous year (from 53% to 40% with no falls). The use of visual, auditory, and tactile cueing to normalize gait parameters is a very common intervention in physical therapy for patients with PD. The use of auditory cues increased walking speed and mean step length during a home-based functional dual task of patients with PD.[4] Gait training with auditory cueing resulted in improved cadence, stride length, and velocity, whereas training with visual cueing resulted in improvements in stride length.[5]

Research on the carryover effect of gait training with auditory, visual, or somatosensory cues discovered that by week 6 follow up many improvements on gait parameters had reduced significantly.[6] A specific type of auditory stimulation known as Rhythmic Auditory Stimulation (RAS) was studied and found that patients that trained with RAS had significant gait improvements they only maintained until week 4 follow up.[8] The discovery of the most effective cueing method that would produce the longest carryover effect with this population would allow clinicians to treat more efficiently.

Methods

Patient was a 68-year-old Caucasian female referred for outpatient physical therapy by her neurologist with the diagnosis of Parkinson's disease. Patient stated her primary reason for seeking care was having multiple falls (x 4) at home, none that caused any serious adverse events. She also reported pain in her low back and knees, 10/10 on the numeric pain scale at worst, and 0/10 at best. Patient lives with her daughter who is her primary caregiver. Upon physical therapy examination, patient demonstrated postural abnormalities of a forward head and protracted shoulders. Reflexes and light touch sensation were intact grossly on both upper and lower extremities. Range of motion of bilateral upper extremities and lower extremities were grossly within functional limits. However, she demonstrated decreased bilateral lower extremity strength, ranging from 4/5 to 4+/5 on the manual muscle testing scale. Upon examination of gait, patient demonstrated a flexed posture of head and trunk without arm swing or trunk dissociation, decreased step length, increased base of support, and slow velocity and cadence. She also demonstrated the festinating pattern that caused frequent loss of balance and required therapist assist for correction. The outcome measures of the Timed Up and Go (TUG), 5 times repeated sit to stand test and lower extremity functional scale (LEFS) were also administered. Scores were 37.72 s for the TUG, 36.90 s for repeated sit to stand, and 20/50 for the LEFS initially. Evaluation of exam data revealed a physical therapy diagnosis of decreased balance, decreased bilateral lower extremity strength, decreased endurance, and gait abnormalities. Short-term and long-term goals were established and included decreasing pain, increasing bilateral lower extremity strength, improving gait and balance to decrease fall risk, improving TUG and repeated sit to stand scores, and becoming independent with the home exercise program. Patient's personal goals included being able to walk without assistance. Refer to Table 1 for choice and progression of interventions and outcome measures.

During her sessions, therapists tried to determine whether auditory or visual cues during gait training would have been more effective for her to assist in improving gait. Visual cues in the form of lines on the floor were initiated during session 5 and were continued until session 10. Auditory cues were initiated during session 9 and 10. Patient improved both TUG and sit to stand scores throughout the plan of care; however, she still reported incidences of falls. Falls occurred between sessions

5 and 6, during the period of time the patient was training with visual cues. Auditory cued training began two sessions later to see if falls and fall risk would reduce.

Therefore, two questions can be asked. The first, would gait training with auditory or visual cues be more effective in impacting the gait parameters of cadence, step length, and gait speed in patients in stage III of the Hoehn and Yahr scale of PD between the ages of 65-70 years old? And two, which training method would result in more adaptability and longer lasting carryover effects? A literature review was performed in order to see the best answer to this question. See Table 2.

RESULTS

Refer to Table 3 for results. The first question asked about the effect of the specific intervention of cueing on increasing specific gait parameters of cadence, step length, and gait speed. Tomlinson et al found that use of cues (auditory, visual, or somatosensory) had a significant impact on increasing gait speed (mean difference 0.04 m/s, 95% CI 0.02 to 0.06; P < 0.001) in participants with PD; however, did not find that they had a significant improvement on cadence, step length, or stride length.[3] In comparison, a systematic review by Spaulding et al found that auditory cueing had a significant effect on increasing cadence (Hedge g = .556; 95% CI, .291-.893), stride length (Hedge g = .497, 95% CI, .289-.696) and velocity (Hedge g= .544; 95%, .294-.795), whereas visual cueing only improved the parameter of stride length (Hedge g = .554, 95% CI, .072-1.036).[5] Rochester et al also found that auditory cues had a significant effect on increasing walking speed (0.64 m/s to 0.73 m/s, P < .027) and mean step length (0.36 m to 0.43 m, P = .018), but only during a dual-task of ambulating while carrying a tray on which two cups of water were placed. Visual cues did not have a significant effect on any of the gait parameters.[4]

The second question asked about the effect of training with cues in regard to a carryover effect on gait parameters. Nieubower et al found that auditory cueing was most effective in increasing turning time in those with and without episodes of freezing of gait (P = .004). Participants maintained cueing effects immediately after the intervention during the second baseline (non-cued) trial and the cueing effect demonstrated was the best performance compared to all cueing trials (P < .001).[7] Nieubower et al found that participants with PD training with their preferred cueing method (67% chose auditory, 33% somatosensory) in their homes for 3 weeks were able to improve gait parameters of speed (increase of 5 cm/s, P = 0.005) and step length (increase of 4 cm, P < 0.001), but not step frequency (P = 0.08). Carryover effects were only present for step length at week 6 postintervention (P = 0.014). Gait effects declined significantly from week 6 to week 12 postintervention.[6] Kadivar et al compared participants with PD either in a control group or training with RAS for 3 times a week for 6 weeks and found that both groups were able to significantly increase their scores on the Dynamic Gait Index (DGI) measure ($F4,10.8 = 13.99$; $P < .001$). The non-RAS group maintained the increase in DGI scores until week 1 post-intervention, while the RAS group maintained the increase until week 8 post-intervention.[8]

DISCUSSION

In most studies, auditory cues were found to have the greatest benefit on increasing cadence, velocity, and step length.[5,6] One study found auditory cueing to have an effect on improving gait speed and mean step length only during dual-tasking,[4] whereas the others found it to be beneficial without having the participant perform a dual task.[5,6] Auditory cueing was superior for improving speed of movement in participants with PD with and without gait freezing episodes.[7] Visual cueing was found to only improve the parameter of stride length,[5] and increasing speed of movement in those with freezing of gait episodes only.[4] One study cited that both types of cueing only significantly improved gait speed and had no effect on cadence, step length, and stride length.[3]

It appears after review of this literature that the type of cue one should use depends on the specific parameter of gait one is trying to improve. Auditory cueing is found in the research to be the superior cueing type to visual, since it improved the most parameters in most studies. The reason why the previously mentioned patient was still having gait difficulties and falls during therapy could be due to her training mainly with the use of visual cues. Use of auditory cues earlier in her gait training may have resulted in improvement on the specific parameters of cadence, velocity, and step length sooner.

There appears to be little evidence or research available on carryover effects of auditory and visual cueing on gait. The longest carryover effects on gait improvements resulted from training with RAS (auditory) cueing and lasted up to week 8 post-intervention.[8] Another study found carryover effects to be significant at week 6 post-intervention, but only for the gait parameter of step length.[6] The same study found gait and balance to decline rapidly from week 6 to week 12 post-intervention.[6]

Carryover effects are an area that needs to be evaluated in more depth in future research. Most research examined in this review only studied the effects of cueing on gait parameters in participants with PD immediately after the intervention. If future studies could definitively discover how long effects of training could last for this specific population, a better prognosis for physical therapy could be determined.

Research also found that those participants with PD that took part in a weekly physical therapy exercise session demonstrated decreased fall risk and actual number of falls than when they participated in bi-weekly sessions.[9] It appears that regular exercise can be of great benefit for this population. Future research could also look at the effect that a community-based or home-based weekly maintenance program would have on decreasing falls in this population.

Putting these two pieces of research together could yield valuable results. If a carryover effects time period and benefits of a weekly maintenance exercise program could be established, individuals with PD and their caregivers would know when maintenance would need to begin to keep functional gains. Use of the specific cueing modality in the maintenance program could improve and help maintain quality of gait. Impact of these findings on clinical practice is that physical therapists could gait train this specific patient population with the cueing modality that would

yield the greatest improvement in gait parameters. If a time frame was in place, they could know how many sessions would be required to maintain carryover effects of the gains made. They can then put together a home exercise maintenance program upon discharge that individuals could continue with at home, local gyms, or community centers to allow these effects to be maintained for a longer period of time. Research needs to continue and hit these targeted areas, in order to allow people with PD to take control of their disease process and their quality of life.

CONCLUSION

Auditory cueing was the most beneficial for improving certain gait parameters. However, how beneficial it truly can be is still in question. When true numerical data of the research was examined, it was found that although improvements were made, they were small. Whether these small positive changes would actually lead to a true improvement in functionality is another area to be looked at in future research. Literature on carryover effects is also inadequate, and would be an area that future research should focus on. If the true functional benefit of cueing on gait in conjunction with the carryover effects of such cueing could be discovered, physical therapists would be able to better serve this patient population and perhaps help maintain functional quality of life for a longer period of time.

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FUNCTIONAL ASSESSMENT FOR MILD COGNITIVE IMPAIRMENT AND EARLY ALZHEIMER'S DISEASE USING THE MONTREAL COGNITIVE ASSESSMENT

Kathryn Brewer, PT, GCS, MEd, CEEAA

In virtually all settings where physical therapy is provided, therapists may be the first clinician to have cause to objectively screen for cognitive changes potentially affecting the ability to perform basic daily activities and safe mobility. *Dementia* is characterized by a slow onset of progressive decline in intellectual impairment, orientation, memory, judgment, and social skills. Reversible dementias may be related to metabolic imbalances, acute infection, or normal pressure hydrocephalus and are important to identify early for effective intervention.

Normal aging cognition changes may include occasional word-finding difficulties, complaints of memory loss, and slowed ability to learn new tasks. Performance of activities of daily living (ADL), instrumental ADLs, social skills, orientation, and awareness of mild memory loss are preserved and performance on cognitive testing is maintained.[1] In the absence of pathological influences, there should be no decline in learning ability and memory before age 60. Cognitive function should not decrease more than 10% from baseline up to age 80.[2]

Alzheimer's disease, a type of dementia, affects 4 million Americans and is the most common form of dementia in adults over age 65. It usually begins with short-term memory loss with progressive regression of behavior, learning capacity, and ability to perform ADLs.[3] An intermediate state from normal aging to potential Alzheimer's disease is called mild cognitive impairment (MCI). At this stage, the individual is not demented and there is absence of functional impairment, yet the cognitive decline is greater than would be associated with normal aging.[2] Complex tasks may be difficult, and memory deficits are often present, while other brain functions are preserved. Mild cognitive impairment represents a risk factor for development of Alzheimer's disease with a 50% conversion rate within 5 years.[1] Consequently, diagnosis of MCI is an opportunity for the health care team to address patient and family emotional needs, environmental modifications, education for patient and caregivers, and begin to address long-term plans regarding care, legal issues, finances, and life/estate planning. Mild cognitive impairment can be associated with several neuropathologic changes; therefore, when suspect, use of neuroimaging techniques may help support clinical assessments and provide a more definitive diagnosis if one exists.[2]

"Alzheimer's disease, a type of dementia, affects 4 million Americans and is the most commom form of dementia in adults over age 65."

Mild cognitive impairment is associated with risk of fall at a rate two times greater than in matched older adults without MCI. This increased risk is related to presence of impaired balance and gait paired with executive function dysfunction.[4] In a 2008 study by Liu-Ambrose, et al, older women with MCI demonstrated a higher number of fall risk factors, specifically balance measures and lower limb coordination than older women without MCI. These authors suggest that falls screening would be prudent for patients with MCI.[4] For the purpose of this discussion, inversely, persons referred for balance deficits should perhaps be screened for MCI.

Cognitive changes may occur slowly with adaptive and compensatory behaviors effectively maintaining the patient's function until an acute illness or injury occurs. This accumulative physiological stress may render the patient incapacitated regarding memory, decision making, safety, and/or functional independence. The geriatric clinician needs to be comfortable assessing cognitive impairment as a component of a comprehensive evaluation in order to set appropriate goals, establish effective interventions and engage sufficient caregiver participation and support for successful, sustainable therapy outcomes.

As with other domains of functional limitation, physical therapists are prepared to objectively measure and document function affecting safety and independence in order to assist with clinical decisions regarding treatment interventions, discharge planning, and demonstrate a baseline to quantify change over time. The Montreal Cognitive Assessment (MoCA©) is a standardized assessment tool, frequently used by our occupational therapy colleagues in interdisciplinary settings. This tool is appropriate for use by physical therapists in settings where we may be the only therapy provider and/or where we are functioning in a primary care capacity and have the opportunity to make referrals for further diagnostics or cognitive treatment. Objective neuropsychological testing is used to confirm cognitive diagnoses, but screening tools may be useful in the clinic for initial documentation of status to justify need for further testing or referral.

The MoCA© is a standardized, clinically researched, cognitive screening test designed to assist health professionals for detection of mild cognitive impairment. It was created in 1996 (Copyright: Dr Z. Nasreddine) in Montreal, Canada. It has high sensitivity (90%)

and specificity (87%) for distinguishing individuals with MCI from those with normal cognition.[5] High test retest reliability (0.92, P < .001) and moderately high internal consistency (.83) is reported by Nasreddine.[6] The test and administration instructions are freely accessible for clinicians, with test manual (directions, scoring instructions) and score sheets available at www.mocatest.org.[7] Additional psychometric properties for specific patient populations such as Parkinson's disease, stroke, brain tumor, Huntington's disease, and others are available at www.rehabmeasures.org.[8]

The time to administer is approximately 10 minutes.[7] The test is available in 35 languages or dialects and has been validated for 55 to 85 year olds. Domains assessed include visuo-spatial and executive, naming, memory, attention, language, abstraction, delayed recall, and orientation. Total score is 30; 26 or above is considered normal. Initial analyses of the MoCA© indicated that persons with 12 years or less of education tended to perform not as good as those with more than 12 years of education. To correct for this effect, 1 point is added to the total score for those with 12 years or less of education.[6] The Nasreddine study specifically establishes validity of the MoCA© compared to the Mini-Mental State Examination (MMSE) and was found to detect MCI in patients performing in the normal range on the MMSE. Ninety-four patients meeting MCI clinical criteria supported by psychometric measures, 93 patients with mild Alzheimer's disease (AD) (MMSE score ≤17), and 90 healthy elderly controls (NC) were tested using the MoCA©, the MMSE, and the same neuropsychological battery. Average MoCA© score for the NC group was 27.4, for the MCI group was 22.1, and for the AD group was 16.2. This compares to MMSE scores of 29, 27, and 23, respectively. The differences between these groups were much more pronounced using the MoCA© than the MMSE. Those individuals with a MoCA© score of 26 or better would be extremely unlikely to meet clinical and neuropsychological criteria for MCI.[6] In conclusion, using the MoCA© as a cognitive screening tool may provide detection of MCI sufficient for referral and further definitive diagnostic testing. Ultimately this may validate a patient's challenge with performance of functional activities required for successful outcomes in the physical therapy plan of care.

CASE EXAMPLE 1

Barry is a 75-year-old male referred to physical therapy for total knee rehab, now at 4 weeks postsurgery. Patient presents to therapy with complaints of right knee (9/10 with activity) and chronic back pain. Walking speed testing reveals slow gait speed (.5 m/sec) with a front wheeled walker and he complains of overall fatigue. Cognitive screening reveals some significant deficits. Montreal cognitive testing: 19/30 suggesting some cognitive dysfunction is present.

Visuospatial/Executive Function:	1
Naming:	3
Attention:	1
Letter identification:	0
Serial subtraction:	2
Language:	0
Language Fluency:	0
Abstraction:	1
Delayed Recall:	5
Orientation:	5
Add 1 pt for ≤ 12 years education:	1
Total:	**19**

There are noted deficits with visuospatial, attention, and language. It was difficult to be sure that the patient is completing the exercises at home properly. Barry's wife has not been present for therapy since the initial evaluation. Following MoCA© test results, she was contacted with a request to attend therapy to ensure carryover of therapy instructions and to review status of patient's overall function with usual daily activity. Barry would benefit from continued physical therapy to progress dynamic balance, activity tolerance, and strength to minimize burden of care and maximize his functional mobility. At this time, however, there are some questions with regard to his cognitive status and how much this is interfering with is motivation/progress.

During a follow-up visit with the patient and his wife, it was revealed that Barry was minimally engaged at home with routine activity only such as self care, surfing the computer, and watching TV. He becomes anxious about changes, choices and decisions, and has difficulty focusing on specific tasks (such as completing his sets of exercises or a game of cards). His wife attributed these behaviors to the patient's pain and fatigue. The results of the MoCA© helped educate Barry's wife regarding his cognitive impairment as a factor in his lack of progress with therapy. It also helped validate his current behaviors. She was advised to contact the primary care physician to further address Barry's condition and pursue potential interventions.

CASE EXAMPLE 2

Paul was referred to physical therapy due to unsteady gait with some balance deficits and a recent fall. He is 78 years old and reported difficulty with thinking and memory over the last couple of years. His fall 6 to 8 weeks ago was the only one he had this year. It involved him waking up in the middle of the night, going to the bathroom, and when he came back, he thought he was lying in the bed, but he missed the bed, and fell to the floor, sustaining a left wrist fracture. Prior to this fall, patient was walking one mile at least 1 to 2 times a week. He is currently not performing any exercises.

Paul's strength is moderately reduced in bilateral lower extremities as demonstrated by the 30-second sit-to-stand. He only completed 8 repetitions compared to 15 reps normal for his age and gender. On the Dynamic Gait Index, Paul scored 20/24, which shows that he is not necessarily safe in community ambulation and demonstrates challenge with dynamic balance tasks. His gait speed was 0.83 m/sec, which is at the low margin for a safe community ambulator. The TUG was 13.1 seconds, below the 9.2-second mean time for his age group.

He scored 22/38 on the Montreal Cognitive Assessment that would place him in a mild cognitive dysfunction category.

Visuospatial/Executive Function:	3
Naming:	3
Attention:	2
Letter identification:	1
Serial subtraction:	3
Language:	0
Language Fluency:	1
Abstraction:	2
Delayed Recall:	1
Orientation:	6
Add 1 pt for ≤12 years education:	0
Total:	**22**

Based on this information, Paul had some mild to moderate strength, balance, and gait deficits. However, the presence of MCI was a contributing factor and should have been addressed in his care. Paul's functional challenges in safe mobility, paired with the evidence of MCI as measured by the MoCA© are consistent with findings in the Liu-Ambrose study.

The Montreal Cognitive Assessment is a rapid screen of cognitive abilities designed to detect mild cognitive dysfunction.[8] It is practical for use in a physical therapy setting and may add insight to a patient's struggle with skills performance, carry over from clinic to home, and ultimately, the ability to meet therapy goals. This cognitive screening tool may assist in comprehensive case management and optimal planning for future care.

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MESSAGE FROM YOUR PTA ADVOCATE: ARE TIMES CHANGING?

Ann Lowrey, PTA

Every spring, just prior to APTA's NEXT Conference and Exposition, APTA's House of Delegates (House) gathers to discuss and vote on issues pertaining to our profession. The House is comprised of voting delegates from each chapter, non-voting delegates (APTA Board of Directors and Section, Assembly and PTA Caucus Delegates), and consultants. For 3 successive days, over 400 physical therapists (PT) and physical therapist assistants (PTA) discuss issues pertaining to the association and the profession of physical therapy. Only the elected physical therapist delegates from each chapter vote on the motions. This year's House will be held in National Harbor, Maryland from June 1 – 3, 2015.

During the 2015 House, there will be 3 motions forwarded from APTA's Board of Directors (Board) that are relevant to the PTA. If adopted, these motions will require amendments to APTA's bylaws and will be monumental in moving forward with the participation of the physical therapist assistant in the governance of APTA.

Here is some background on where those motions came from. In 2012, during the PTA Caucus Business Meeting prior to the House, there were 6 goals established by the caucus: expansion of PTA entry-level education; expansion of post entry-level education and specialization to include designation; active participation in governance at all levels; promotion and protection of payment for PTA services; and expansion of scope of work and promotion of the PT/PTA team. In 2013, APTA President Paul Rockar appointed a PTA Board Work Group to address these goals. It was comprised of 4 PTAs, 4 Board members, and 2 APTA staff. This group met often to discuss the goals and how to achieve them. The PTA Board Work Group presented their report to APTA's Board of Directors in April 2014. During this meeting (http://www.apta.org/BOD/Meetings/), the Board adopted 8 motions related to the PTA, 3 of which are the possible bylaw changes being presented to the House in 2015.

PTA member eligibility to serve in a non-officer position on the Board. This means that a PTA may be nominated for and run beside a Physical Therapist for a Board of Director position. This is not a designated position on the Board. A non-officer position means that a PTA may not run for President, Vice President, Secretary, Treasurer, or House Speaker/Vice Speaker positions. As a board member, the PTA will represent all members of APTA and participate on an equal level with other PT Board members. Currently, PTAs serve in positions of leadership in other related areas such as state boards of physical therapy, CAPTE (Commission on Accreditation of Physical Therapy Education), and FSBPT (Federation of State Boards of Physical Therapy).

Allowing components the option to amend their bylaws to provide PTA members a full vote at the component level. A component is your chapter/state. Currently, PTAs have ½ vote at the component level where PTs have a full vote (see section 2 of APTA bylaws). Allowing each component the option of changing their bylaws respects the rights of components to make this determination. Currently, no other medical association provides voting members a ½ vote and there is no reference in Robert's Rules of Order addressing a ½ vote.

Allowing chapters the option to amend their bylaws to permit PTA members to serve as chapter delegates. This motion also respects the decision of each component to make the determination of change. If adopted by the House and then the component, PTAs will run beside PTs for the position of delegate in their respective chapter to serve in the House. A PTA in this position will represent all members of their chapter and our profession.

Motions that will be forwarded to the 2015 House are currently being discussed on The HUB, which is a communication page for open discussion for delegates attending the House. The HUB contains a number of other topics relevant to our association that is open to membership. I encourage all APTA members to become familiar with what occurs during the House of Delegates. Decisions are made that impact our profession and you as a member of APTA. Please visit http://www.apta.org/HOD/ to find your chapter's delegates, to review the 2014 House minutes, and to visit The HUB.

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BALANCE OUTCOME MEASURES FOR THE OLDER ADULT POPULATION

Bonni Kinne, PT, MSPT, MA

The Rehabilitation Measures Database[1] was created in January 2011. Since that time, over 250 outcome measures have been reviewed by focus groups comprised of health care professionals. Ten of these outcome measures objectively assess the standing balance of community-dwelling older adults and have normative data as well as cut-off scores associated with them. These outcome measures include (1) the 30-Second Sit to Stand Test, (2) the 360-Degree Turn Test, (3) the Berg Balance Scale, (4) the Clinical Test of Sensory Interaction and Balance, (5) the Dynamic Gait Index, (6) the Four Step Square Test, (7) the Functional Gait Assessment, (8) the Multidirectional Reach Test, (9) the Timed Up and Go, and (10) the Tinetti Performance Oriented Mobility Assessment.

30-SECOND SIT TO STAND TEST

The 30-Second Sit to Stand Test takes approximately 30 seconds to administer. The required equipment includes a chair with a 17-inch seat height and a stopwatch. During this outcome measure, the participant completes as many sit to stand transfers as possible. The individual's score is the number of sit to stand transfers performed during a 30-second period. In terms of normative data based upon age, the mean score was 14.0 repetitions for individuals 60 to 69 years old, 12.9 repetitions for individuals 70 to 79 years old, and 11.9 repetitions for individuals 80 to 89 years old.[2] In terms of normative data based upon gender, the mean score was 13.7 repetitions for males and 12.7 repetitions for females. The cut-off scores associated with functional independence were 15 repetitions (females) to 17 repetitions (males) for individuals 60 to 64 years old, 15 repetitions (females) to 16 repetitions (males) for individuals 65 to 69 years old, 14 repetitions (females) to 15 repetitions (males) for individuals 70 to 74 years old, 13 repetitions (females) to 14 repetitions (males) for individuals 75 to 79 years old, 12 repetitions (females) to 13 repetitions (males) for individuals 80 to 84 years old, 11 repetitions (both females and males) for individuals 85 to 89 years old, and 9 repetitions (both females and males) for individuals 90 to 94 years old.[3]

360-DEGREE TURN TEST

The 360-Degree Turn Test takes less than 5 minutes to administer. The required equipment includes a stopwatch. During this outcome measure, the participant completes a 360-degree turn. The individual's score is the average time it takes to perform two trials of this activity. In terms of normative data, the mean score was 2.2 seconds for individuals in a non-fall group and 2.7 seconds for individuals in a fall group.[4] The cut-off score associated with functional independence was 3.8 seconds.

BERG BALANCE SCALE

The Berg Balance Scale takes 15 to 20 minutes to administer. The required equipment includes a chair with armrests, a chair without armrests, a step stool, a measuring tape/ruler, a shoe/slipper, and a stopwatch. During this outcome measure, the participant completes 14 different balance activities (sitting unsupported, sit to stand transfer, standing unsupported, standing with eyes closed, standing with feet together, forward reach, retrieving object from floor, turning to look behind, turning 360 degrees, alternating stool touch, tandem standing, standing on one leg, stand to sit transfer, and pivot transfer). The individual's score is based upon each activity being rated on a 0-4 point scale (maximum score of 56). In terms of normative data, the mean score was 55 (both females and males) for individuals 60 to 69 years old, 53 (females) to 54 (males) for individuals 70 to 79 years old, and 50 (females) to 53 (males) for individuals 80 to 89 years old.[5] The cut-off score associated with functional independence was 45.[6]

CLINICAL TEST OF SENSORY INTERACTION AND BALANCE

The Clinical Test of Sensory Interaction and Balance takes approximately 20 minutes to administer. The required equipment includes a piece of foam, a visual conflict dome, and a stopwatch. During this outcome measure, the participant completes up to 30 seconds of 6 different sensory conditions (firm surface with eyes open, firm surface with eyes closed, firm surface with dome, foam surface with eyes open, foam surface with eyes closed, and foam surface with dome). The individual's score is the total time it takes to perform 3 trials of this activity (maximum score of 540 seconds). In terms of normative data, the mean score was 30.0 seconds for individuals in a non-fall group and 29.7 seconds for individuals in a fall group (condition #1), 29.7 seconds for individuals in a non-fall group and 27.9 seconds for individuals in a fall group (condition #2), 29.2 seconds for individuals in a non-fall group and 26.5 seconds for individuals in a fall group (condition #3), 30.0 seconds for individuals in a non-fall group and 26.9 seconds for individuals in a fall group (condition #4), 26.2 seconds for individuals in a non-fall group and 21.0 seconds for individuals in a fall group (condition #5), and 26.9 seconds for individuals in a non-fall group and 21.1 seconds for individuals in a fall group (condition #6).[7] The cut-off score associated with functional independence was 260 seconds.[8]

DYNAMIC GAIT INDEX

The Dynamic Gait Index takes less than 10 minutes to administer. The required equipment includes a 20-foot walkway, a shoebox, two same-sized obstacles, and a set of stairs. During this outcome measure, the individual completes 8 different gait activities (20-foot walk, changes in gait velocity, walking with head turns, walking with head tilts, pivot turns while walking, stepping over obstacle, stepping around obstacles, and stair climbing). The individual's score

is based upon each activity being rated on a 0-3 point scale (maximum score of 24). In terms of normative data, the mean score was 24.0 for individuals 30 to 39 years old, 24.0 for individuals 40 to 49 years old, 23.9 for individuals 50 to 59 years old, 23.9 for individuals 60 to 69 years old, 23.2 for individuals 70 to 79 years old, and 22.0 for individuals 80 to 89 years old.[9] The cut-off score associated with functional independence was 19.[10]

FOUR STEP SQUARE TEST

The Four Step Square Test takes less than 5 minutes to administer. The required equipment includes 4 canes and a stopwatch. During this outcome measure, the individual completes one clockwise sequence immediately followed by one counterclockwise sequence of placing both feet in each of the 4 "squares" that have been created by arranging the 4 canes like a cross. The individual's score is the best time it takes to perform two trials of this activity. In terms of normative data, the mean score was 17.6 seconds for individuals in a non-fall group and 32.6 seconds for individuals in a fall group.[11] The cut-off score associated with functional independence was 15 seconds.[12]

FUNCTIONAL GAIT ASSESSMENT

The Functional Gait Assessment takes 5 to 10 minutes to administer. The required equipment includes a 20-foot walkway, two shoeboxes, a set of stairs, and a stopwatch. During this outcome measure, the individual completes 10 different gait activities (20-foot walk, changes in gait velocity, walking with head turns, walking with head tilts, pivot turns while walking, stepping over obstacle, tandem walking, walking with eyes closed, walking backward, and stair climbing). The individual's score is based upon each activity being rated on a 0-3 point scale (maximum score of 30). In terms of normative data, the mean score was 28.9 for individuals 40 to 49 years old, 28.4 for individuals 50 to 59 years old, 27.1 for individuals 60 to 69 years old, 24.9 for individuals 70 to 79 years old, and 20.8 for individuals 80 to 89 years old.[13] The cut-off score associated with functional independence was 22.[10]

MULTIDIRECTIONAL REACH TEST

The Multidirectional Reach Test takes less than 5 minutes to administer. The required equipment includes a yardstick and a level. During this outcome measure, the individual completes a maximum reach in the forward, backward, right, and left directions. The individual's score is the average length of reach in each direction that occurs in two to 3 trials of this activity. In terms of normative data, the mean score was 8.89 inches for the forward reach, 4.64 inches for the backward reach, 6.86 inches for the right reach, and 6.61inches for the left reach.[14] The cut-off scores associated with functional independence were 8.38 inches for the forward reach, 4.06 inches for the backward reach, 6.12 inches for the right reach, and 5.67 inches for the left reach.

TIMED UP AND GO

The Timed Up and Go takes less than 3 minutes to administer. The required equipment includes a chair with armrests and a stopwatch. During this outcome measure, the individual performs a sit to stand transfer, walks 3 meters, turns around, walks back to the chair, and performs a stand to sit transfer. The individual's score is the amount of time it takes to perform this activity after one untimed practice session. In terms of normative data, the mean score was 8 seconds (both males and females) for individuals 60 to 69 years old, 9 seconds (both males and females) for individuals 70 to 79 years old, and 10 seconds (males) to 11 seconds (females) for individuals 80 to 89 years old.[5] The cut-off score associated with functional independence was 13.5 seconds.[15]

TINETTI PERFORMANCE ORIENTED MOBILITY ASSESSMENT

The Tinetti Performance Oriented Mobility Assessment takes 10 to 15 minutes to administer. The required equipment includes a 15-foot walkway, a chair without armrests, and a stopwatch. During this outcome measure, the participant completes 16 different balance/gait activities (sitting unsupported, qualitative sit to stand transfer, quantitative sit to stand transfer, immediate standing balance, standing unsupported, feet together with perturbations, feet together with eyes closed, turning 360 degrees, stand to sit transfer, gait initiation, step length and height, step symmetry, step continuity, gait path, trunk motion, and gait stance). The individual's score is based upon each activity being rated on a 0-1 or a 0-2 point scale (maximum score of 28). In terms of normative data, the mean score was 25.16 (females) to 26.21 (males) for individuals 65 to 79 years old and 17.20 (females) to 23.29 (males) for individuals over 80 years old.[16] The cut-off score associated with functional independence was 21.[17]

CONCLUSION

This article reviewed 10 balance outcome measures for the older adult population. Five of the outcome measures (the 30-Second Sit to Stand Test, the 360 Degree Turn Test, the Four Step Square Test, the Multidirectional Reach Test, and the Timed Up and Go) take less than 5 minutes to administer and require very little equipment. The other 5 outcome measures (the Berg Balance Scale, the Clinical Test of Sensory Interaction and Balance, the Dynamic Gait Index, the Functional Gait Assessment, and the Tinetti Performance Oriented Mobility Assessment) are widely used tests that may provide the physical therapist with more comprehensive information. In addition, all 10 balance outcome measures demonstrate acceptable, if not excellent, reliability and validity.

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IS THIS DEMENTIA, DEPRESSION, OR ALCOHOLISM?

Jill Heitzman, PT, DPT, GCS, NCS, CWS, CEEAA, FACCWS

Symptoms of depression and dementia can commonly occur with aging adults who have alcoholism. The damage caused by alcohol involves mild to moderate memory impairment, slowed cognition processing, and executive function activities that are very similar to dementia.[1] Neuro imaging shows cell death as a result of alcohol whereas in dementia plaques and tangles comprised of the protein fragments cause the cell death and the chemicals involved in transmission are decreased.[2,3]

Alcohol related problems and risks in aging adults my arise due to the combination of alcohol, medications, and comorbities such as diabetes, depression, and hypertension.[2] Alcohol consumption affects drug metabolism and thus symptoms can come on quicker than at a younger age. The cognitive changes from alcohol result from the toxic effects on the liver and brain as well as secondary multi organ changes due to malnutrition, vitamin deficiency, and resultant injuries due to the instability with function.[1]

The following chart is a comparison of the onset, progression, and symptoms associated with alcoholism, dementia, and depression.[1,3-6] Understanding the differences may assist the therapist in early recognition to obtain the best help for patients. Remembering that overall alcoholism is a fluxuations of symptoms related to consumption, dementia is a gradual onset, and depression is an illness that usually has an onset trigger but the patient is oriented to date, time, and place.

Symptoms	**Alcoholism** Physical addiction	**Dementia** Changes within the brain (disease process)	**Depression** Illness that involves the body, mood, and thoughts
Changes in behavior	Fluctuating behaviors.	Gradual decline. May become depressed. Personality changes, lack of awareness of personal hygiene.	Resulting from some event. Usually do not get dementia.
Memory and reasoning	Confusion or memory loss with severe alcoholism.	Difficulty in short term memory.	Recognizes difficulties and worries about them.
Learning, concentration, thinking	Difficulty concentrating. Poor judgment when drunk.	Difficulty in learning new information. Difficulty concentrating in later stages. Changes affect daily activities. Judgment becomes more impaired.	Difficulty concentrating and maintaining focus. Often indecisive and concerned about making mistakes.
Orientation to place and time	Confused	Confused and disoriented, lost in familiar places.	Oriented to date, time, and place.
Language skills	Slowed speech. May be exaggerated or slurred.	Change over time. Difficulty expressing and receiving information. Difficulty writing.	Slow but normal.
Social skills	Vary depending on level of alcohol in the system.	Skills become impaired, inappropriate.	Often negative, jump to conclusions.
Response to cognitive and functional deficits	May not pay attention to changes or problems.	May notice changes early on but over time does not notice changes.	Notices and worries about changes.
Vital signs	High blood pressure that does not improve with medication.	No different than what is normal changes for the individual.	No different than what is normal changes for the individual.

Symptoms	Alcoholism Physical addiction	Dementia Changes within the brain (disease process)	Depression Illness that involves the body, mood, and thoughts
Motor skills, falls	Frequent falls or unsteadiness, poor coordination, abnormal gait (when drunk). Shakiness in a.m. prior to drinking.	Decline as disease progresses.	No specific problems.
Control of body functions	Urinary incontinence.	Loss of body function control at late stages.	No specific concerns.
Eating behaviors	Stomach pain or gastritis, vomiting.	Gradual weight loss over the years. Large increase in weight may be secondary to decreased activity or medications.	Changes with severe depression to not eating. May have an increase or decrease in eating patterns.
Sleep behaviors	May fall into a drunken sleep.	Sleep cycle gradually becomes disrupted due to brain changes. May have night time wakening and daytime sleeping.	May change from sleeping too much or not enough (insomnia).
Agitation	Anxiety	Gradual. Worse at the end of the day and in unfamiliar settings.	Agitation is worse in the mornings and persists throughout the day. Restlessness.
Mood	Depressed	Generally normal. Unhappiness is response to circumstances and varies. May brighten with support and stimulation. Does not express sadness.	Subacute onset of pervasive sad mood most of the day and nearly every day. Does not brighten with stimulation.
Worried, guilt	May have some concerns about behaviors.	Uncommon. May have some problems in times of stress and when aware of declining abilities.	Common in severe depression and is usually accompanied by low mood or changes in appetite and sleep.
Energy	Varies	Generally normal energy with reduced activity due to poor initiation levels related to decreased executive functioning.	Subacute decrease in energy and may complain of fatigue and physical exhaustion.
Initiative or interest	Varies	Gradual loss. Apathy increases over time. Enjoys activities in a structured environment.	Subacute. Loss of interest and pleasure accompanied by sad moods.
Suicidal thoughts	Usually not common	Uncommon	Common

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References for this article will be printed in an upcoming issue of *GeriNotes*.

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SCREENING FOR DEPRESSION IN HISPANIC OLDER ADULTS

Dulce Flores, PT, DPT

The World Health Organization defines health as "a state of complete physical, mental, and social well-being."[1] Mental health is an essential part of overall health, which should be screened for as early intervention for the patient population of all settings in health care. Hispanics are the majority of the patient population at a community-owned hospital in Southeast Texas.[2] Hispanics are also identified as the fastest growing segment of elderly Americans.[3]

An increase in the Hispanic population will also be experienced in the patient case load for many outpatient clinicians in Southeast Texas. The patients that walk into a Physical Therapy Outpatient Clinic are not just evaluated for the musculoskeletal complaint but are also screened for other medical conditions that may require a referral. A physical therapist that is an expert in observing body movement as well as active listening skills, will also notice signs and symptoms of depression with Hispanic older adults.

During an outpatient evaluation, it is critical to assess mental health in Hispanic older adults. There is a higher risk of depression and anxiety in elderly Hispanic immigrants compared to elderly U.S. born patients.[4] As primary care providers it is vital to screen patients for depression and anxiety with the tools that are highly reliable and valid, such as Geriatric Depression Scale,[5] Patient Health Questionnaire-9 (PHQ-9),[6] and Generalized Anxiety Scale in Spanish[7] for the Hispanic population. Although these tools provide quantitative data, there is a great limitation for patients who have a low literacy to complete the survey independently. There are other ways to collect quantitative information, such as how many hours the patient is sleeping or how many activities the patient performs in one day.

Unfortunately, the patients do not always state they are depressed because stigma among Hispanic culture exists.[8] Sometimes, the depressive symptoms may be masked by physical complaints, particularly among frail older adults.[9] Asking the appropriate questions to screen for mental health is important for early intervention. Qualitative information is gathered, such as how the patient describes the symptoms.[9] Therefore, the patient and the family members are questioned about behaviors, eating habits, sleep quality, physical activity, and mood.

"Mental health is an essential part of overall health, which should be screened for as early intervention for the patient population of all settings in health care."

There are instances where Hispanic elderly patients report mental distress and use adjectives not mentioned in the questionnaires due to low vocabulary or regional idioms. A cross-sectional pilot study by Letamendi et al explored how older Mexican-American adults reported anxiety and depression.[9] The study found that there are idioms used to describe depression that are not used in the screening tools for the Anglo-American patient. The idiom "desesperada" (desperate) was reported by 29% of the participants.[9] The top 5 words that patients used were: "sad," "nervous," "anxious," "desperate," and "depressed" in Spanish. The words stress or trauma were not used to describe the mental distress. The study also suggests that older persons report symptoms of depression and anxiety different than younger adults and between cultural groups.

In conclusion, it is important to collect qualitative and quantitative information from patients to evaluate and treat them with a biopsychosocial approach. The services are available for the patients, but screening them is the first step towards early intervention, especially when there are fatal consequences at stake. The Centers for Disease Control and Prevention reported that the second highest suicide rate was among patients 75 years and older.[10] The role as primary health care providers includes screening for mental health, especially for vulnerable populations like Hispanic older adults.

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