

Implementing the USA Model of the Otago Exercise Program to Reduce the Risk of Falls in Clinical, Community, ALF, and SNF Settings

Tiffany Shubert, PhD, MPT
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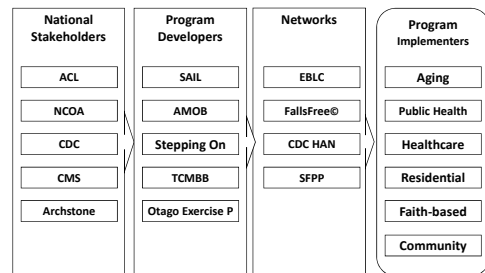
Objectives

- Understand local, state, and national initiatives related to the public health issue of falls
- Describe key elements of the USA Otago Exercise Program
- Evaluate implementation models for the OEP in community, outpatient, assisted living and skilled nursing settings
- Evaluate the value of integrating the OEP into your practice and create an implementation plan

Who is here today?

- What setting do you represent?
- Define your problem
- What do you want to get from today?

The Evidence-Based Movement



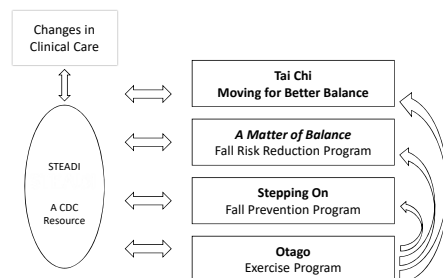
What is an Evidence-Based Fall Risk Management Program?

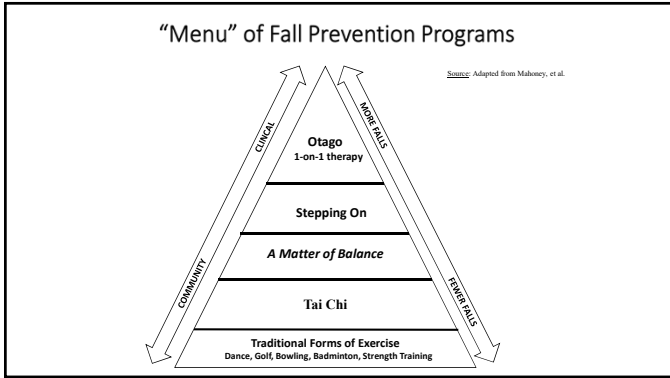
- A Matter of Balance
- Stepping On
- SAIL (Stay Active and Independent for Life)
- Tai Chi for Arthritis
- Tai Ji Quan: Moving for Better Balance
- The Otago Exercise Program



- Standardized implementation
- Proven outcomes
- Adjunct to physical therapy
- Excellent way to build partnerships in the community

CLINICAL & COMMUNITY INTEGRATION





What is the Otago Exercise Program?

- Evidence-based fall prevention program developed, implemented and evaluated in New Zealand (1997 - 2003)
- 5-6 visits delivered over 8 weeks in home or outpatient settings; Follow up visit if possible at 6 months and 1 year
- Follow up phone calls and visits as needed for up to a year
- Standard set of balance and strength exercises (17 to choose from)
- Patient does exercises INDEPENDENTLY
- Exercise program progressed by physical therapist
- Best for community-dwelling **but frail**

Most Appropriate For:

- Older adults who have experienced at least one fall
- Older adults who have significant balance impairments
- Older adults who would have challenges participating in a community-based program

Exercise Prescription

- Select which of the 17 exercises are most appropriate for your patient
- Make sure they have access to ankle weights
- Progress in balance challenge and intensity over the course of the program

Progression Guidelines

- 2 sets of 10 of appropriate exercises
- Typically prescribe 7-10 total exercises
- When 2 sets of 10 easy
 - Increase weight lifted
 - Increase balance challenge
- Always prescribe ankle weights (even if empty) for those who are more frail

Progressive Strength Exercises

Progressive
Strength Exercises

Seated Leg Extension with weight
 Hip Abduction with weight
 Leg Flexion with weight

Progressive Strength Exercises

Supported Heel Raises
 Unsupported Heel Raises
 Supported Toe Raises
 Unsupported Toe Raises

Progressive Balance/Strength Exercises

Sit-to-Stand Two Hands
 Sit-to-Stand One Hand
 Sit-to-Stand No Hands

Progressive Static Balance Exercises

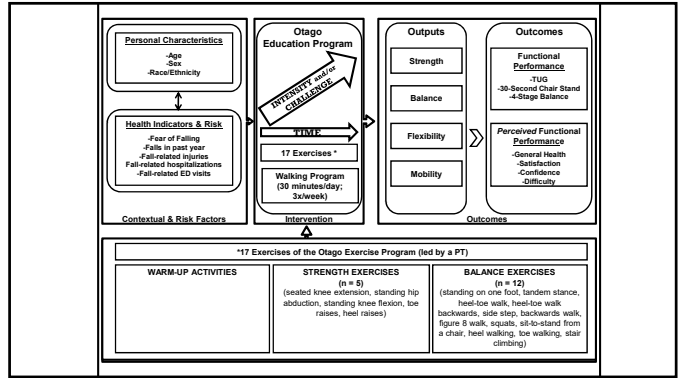
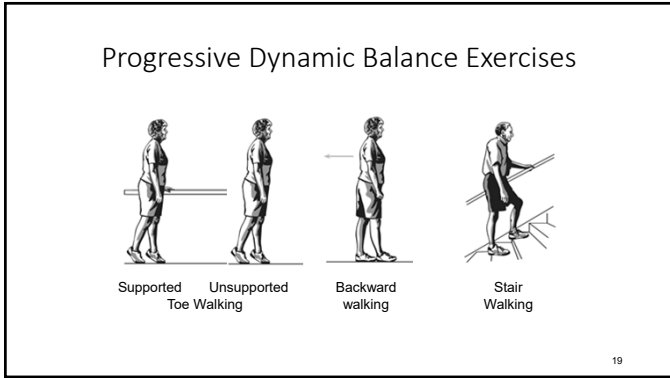
Supported Heel – Toe Standing
 Unsupported Heel – Toe Standing
 Supported One Leg Stand
 Unsupported One Leg Stand

Progressive Balance Exercises

Supported Knee bends
 Unsupported Knee bends
 Supported Backward Walking
 Unsupported Backward Walking

Progressive Balance Exercises

Sideways Walking
 Supported Heel – Toe Walking
 Unsupported Heel – Toe Walking
 Walking and Turning Around



Why the Otago Exercise Program???

- Randomized controlled trial demonstrated a reduction in falls of 35% (Campbell, 1995)
- Reduced risk of death (Thomas, 2010)
- Cost effective (Carande-Kulis, 2015)
 - Persons aged 65 and older, the ROI was 36% for each dollar invested
 - Persons aged 80 and older, the ROI was 127%
- Resource efficient
 - One physical therapist or PT Assistant
 - 6 visits
- Most effective for high risk of hip fracture or death from a fall
- Most effective for those with limited access to outpatient clinics
- Effective environment for adherence and compliance

CDC Fall Prevention Initiatives

- State Fall Prevention Program – 2011-2014
 - Funded 3 states to disseminate Tai Chi, Stepping On, Otago Exercise Program, and STEADI
 - Fund an evaluation team
- Falls Evaluation and Technical Assistance Team
 - *How do we facilitate the adoption of fall prevention programs and practices by all stakeholders?*
 - *How do we 'scale up' while planning for sustainability?*
 - Funded dissemination project, training, website, and centralized database

OEP Training

- Access online training, videos, tools for your practice and patients:
 - <http://www.med.unc.edu/aging/cgec/exercise-program>
- Launched March 2013; Updated March 2016
- 3-hour online-training for physical therapists in implementation

Over 8000 PTs completed training

Participants from over 22 countries

Online training \$35

Free Monthly Q&A Webinars

Implementation – Original Studies

Month	1			2		3	4	5	6
Week	1	2	3	4	6	8			
Initial Visit	Initial	Visit	Visit	Visit	Visit				Visit
Call							Call	Call	Call
Month	7			8		9	10	11	12
Week									
Visit/DC									Visit/DC
Call	Call	Call	Call	Call	Call	Call	Call	Call	

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Example Plan & Progression

Otago Visit	Purpose	Prescription	Notes
Initial (1)	Evaluate if necessary; Prescribe initial exercises Teach mastery of exercises	<ul style="list-style-type: none"> Should introduce a level of challenge Always include warm-ups Always include the 3 exercises which use ankle weights Select appropriate exercises from the 17 	<ul style="list-style-type: none"> Assess if patient appropriate and safe to include a walking program If too weak to lift weights, put empty ankle cuff on to create the habit of using weights
2	Assess adherence & compliance; Mastery of exercises Progress if appropriate	<ul style="list-style-type: none"> Progress challenge and intensity of exercises Progress weights 	<ul style="list-style-type: none"> If patient has not done HEP – problem solve to determine why and review importance of HEP for patient success
3	Assess adherence and compliance Assess mastery Assess intensity, challenge and duration	<ul style="list-style-type: none"> Progress challenge and intensity of exercises Add in new exercises if appropriate Progress weights Introduce walking if not done so far 	<ul style="list-style-type: none"> If patient has not done HEP consider discharge to a different program If patient has mastered, consider discharge to a more challenging program
4	Assess adherence and compliance Assess mastery Assess intensity, challenge and duration	<ul style="list-style-type: none"> Progress challenge and intensity of exercises Progress weights Add in new exercises if appropriate Progress walking 	<ul style="list-style-type: none"> Patient should be 100% independent with program Consider re-assessing performance to show patient progress
5	Insure patient 100% independent with program Insure progression is in place	<ul style="list-style-type: none"> Progress challenge and intensity of exercises Progress weights Add in new exercises if appropriate Progress walking 	<ul style="list-style-type: none"> Patient should understand value of continuing with exercises If exercises get easy, patient should either self-progress or check in

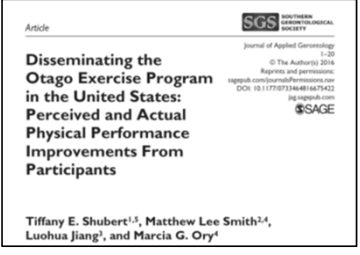
The Challenge: How to make the OEP feasible in the US

- ### Questions about US Implementation
- Setting – Big challenge
 - Home
 - Outpatient (?)
 - Group (?)
 - Duration
 - Difficult to manage in home health and Part B
 - Patients
 - Often too frail to participate
 - If strong enough to participate, may no longer be appropriate for therapy
 - Providers
 - Does Otago truly require a skilled clinician?
 - What is the role of the PT? PTA? Patient/Caregiver?
 - Phone calls

What does US implementation look like?

Study #1

- What do outcomes look like at 8 weeks?



- ### Sample Characteristics
- On average, aged 80 years (± 11.7)
 - 69% female
 - 96% White; 2.5% African American
 - 4% Hispanic
 - 88% reported being fearful of falling
 - 60% reported falling in the past 12 months
 - On average, 1.7 falls (± 1.9)/participant

- ### Data Collection & Analyses
- Assessments collected at baseline, 8-weeks, & discharge
 - Data analyzed from 210 older adults baseline & 8 weeks
 - Not enough information to analyze discharge data
 - 28 healthcare providers representing 12 agencies in 8 states
 - CO, CT, NC, NE, NH, OR, PA, SC
 - Linear mixed effects models for continuous variables
 - General Estimating Equation (GEE) models for binary variables

Results at 8 weeks

- Improvements in Perceived Functional Performance
 - Self-reported health
 - Confidence to keep from falling
 - Activity restrictions because of walking difficulties
 - Self-reported functional ability (no difficulty)
- Improvements in Actual Functional Performance
 - Timed Up-and-Go Test
 - 30-Second Chair Stand
 - Four-Stage Balance Test

Implications





- Findings support the OEP model translated for use in the United States delivered in the home or the outpatient setting resulted in similar outcomes at 8 weeks
- Additional barriers were reported in addition to those originally identified
 - System-based challenges to maintaining a patient on caseload for an extended period of time,
 - Concerns about billing and reimbursement
 - Costs to the patients in the form of co-pays
 - Inability to be reimbursed for phone-based follow-ups
 - Concerns about adherence and compliance

Shubert, Smith, Ory, Clarke, Bombardier, Roberts, & Rudy-Whithead, (2018). Translation of The Otago Exercise Program for adoption and implementation in the United States. Frontiers in public health, 2.

Despite proven benefits

- Limited adoption
 - No Medicare billing code
 - Complex implementation, documentation and billing models
 - Complex Medicare regulations regarding who is appropriate and inappropriate for therapy
- Limited reach
 - Lack of physical therapists in rural areas
 - Challenges disseminating information

The OEP Clinical Experience

Mandatory PT Management Phase							[Optional] Self- Management Phase				
Month	1				2		3	4	5	6	
Week	1	2	3	4	6	8					
	Initial	Visit		Visit	Visit	Visit				Visit	
							Call	Call	Call		
Month	7		8		9	10	11	12			
Week											
										Visit/DC	
	Call		Call		Call		Call		Call		

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Is a little OEP enough?

- Home health delivery can be effective (Beato, 2018)
 - Patients who have participated in Otago delivered in ALF fell significantly less compared to a control group
 - 2-3x/week
 - 4-9 weeks

What is the secret sauce?

- Structured and progressive exercises mostly done in standing
- 180 minutes/week of strength, balance, and aerobic exercise (CDC, 2015)

US Implementation Questions?

US Implementation Barriers or Challenges?

- ### Innovation in Implementation
- PACE Implementation
 - Virtual delivery of OEP
 - The OEP as a community-clinical partnership
 - The OEP as an exercise class
 - Provider lead
 - Peer lead

- ### Program for All Inclusive Care of the Elderly
- Pilot of OEP in 5 PACE sites in North Carolina (2014-2016)
 - 3 sites collected baseline data
 - 2 sites collected outcomes data
 - Site with most data used an exercise physiologist to implement program and collect data
 - High risk population
 - Captive audience
 - Minimal impact of Medicare policies & procedures
 - Multiple Dissemination Models
 - PT Eval; Rehab tech implementation
 - PT Eval; Group exercise
 - PT Eval; Wellness program

- ### Implications & Anecdotes
- Implications**
- Potentially viable & effective program for PACE participants
 - Need system-wide support to change and implement new workflows
 - Can work with cognitively impaired but with additional support
- Anecdotes**
- Once you have seen a PACE site, you have seen a PACE site
 - No systematic way for PTs to manage patients
 - Works best with ancillary personnel (exercise physiologists, rehab tech) who can run programs

Stand Tall - A Virtual Fall Prevention Solution

Phase 1 and Phase 2 SBIR

Can Seniors use this technology?
Will Seniors use this technology?
How does participation impact outcomes?


Stand Tall—A Virtual Translation of the Otago Exercise Program

Tiffany E. Shubert, MPT, PhD, Nancy Chodura, PT, DPT, Victoria M. Mariani, PT, PhD, Virginia Stone, MS, John Buchanan, MS, James Bennett, MS, Markham Lee Smith, PhD

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Characteristics	N = 21	Number
Gender	Female	14
	Male	7
Race	Black	8
	White (non-Hispanic)	7
	Asian White	3
Education	Pacific Islander	2
	White (Hispanic)	1
	High School/GED	8
Computer Ability	Community College	4
	Bachelor's Degree	4
	Graduate Degree	5
Living Status	Don't Use	4
	Novice/Average	12
Health Status	Expert	5
	Alone	18
Fallen in past 12 months	With Spouse	3
	Excellent/Very Good	12
	Good	6
Yea	Fair/Poor	3
	Yes	6

Outcomes



- Diverse set of seniors wanted to use technology to improve balance
- No correlation between education, fall risk, computer expertise and usability scores
- Supports virtual delivery of an exercise program as feasible for this population

"This is great, when is it coming to the Senior Center?"

"I can do this, it is fun!"

"I would love to use this in my home, and I see how it would benefit other seniors."

Phase 2

- Will Seniors use this technology?
- How does participation impact outcomes?

CDC Phase 2 SBIR Grant #5R44CE002343-03


Study Design

- 1 week onboarding period
- 8 week intervention session
 - Scheduled for 3x/week; 30 minute sessions
- Option to continue on for 6 months
- Measures (Baseline, 8 weeks, 6 months)
 - Self-efficacy
 - FES
 - Berg
 - TUG, 30-second, 4 Stage Balance Test
 - Fear of falling
 - System Usability Scale
 - General Physical Activity
 - Falls (while using the system and outside of using the system)

Implementation Model

Stand Tall Kiosk

- All-in-one: Large screen TV, Kinect Camera, computer, internet access, VERA software, dedicated space
- Sessions designed to provide optimal dose and intensity of exercises for 30 minutes, three times a week
- System alerts to pain or missed sessions, allowing one study personnel to monitor results of all users



47 1. Hold pose

OEP Exercise Protocols

- Developed 12 progressively more challenging protocols using the Otago Exercises
- Reviewed by two clinicians for validity
- All subjects started with ankle weights
- Subjects monitored offsite by personnel and provided weekly progress emails and check ins about progression

Seniors Use Stand Tall

- Users are highly engaged
- 38/40 completed 8 week intervention
 - 20/40 volunteered to continue for 6 months
 - 90% = average adherence rate (17 – 24 sessions/ 8 weeks)
 - 97% confident they can independently manage their program and weights
 - 94% confident they will not lose their balance while doing Stand Tall
 - No falls during the actual intervention

Outcomes – Functional Measures at 8 weeks

Test	Baseline (Mean ± SD) (n = 34)	8 Week Mean (Mean ± SD) (n=34)	24 Week Mean (n= 19)	Baseline # At Risk	8 Weeks # At Risk	24 Weeks # At Risk
Timed Up & Go (> 12 Seconds = At Risk)	11.3 (2.9)	10.3 (2.7)	8.6 (5.9)	12	9	0
30 Second Chair Rise (Age & Gender Normative Values)	9.3 (5.8)	10.5 (3.9)	12.4 (4.9)	28	18	27
Tandem Stance (< 10 Seconds = At Risk)	14.9 (11.4)	21.9 (10.1)	26.6 (6.5)	21	5	0
Single Leg Stance (R) (< 10 Seconds = At Risk)	4.8 (6.7)	9.4 (9.2)*	9.8 (8.1)	29	16	12
Single Leg Stance (L) (< 10 Seconds = At Risk)	5.8 (7.3)	10.5 (11.3)*	12.0 (7.8)	25	13	10
Berg	48 (7.7)	50.8 (5.6)	54.5 (1.9)	7	4	0

* Significant at P < .02

Summary

- Older adults can and will use virtual technologies to improve strength and balance
- Older adults with mild cognitive impairment can successfully use technology to participate in an evidence-based fall prevention program
- Men like using technology
- Adherence and compliance rates are higher than average using a virtual technology
- A physical therapist is not necessarily needed to deliver this type of intervention

OEP in the Community

- AAA implementation
- Peer-lead classes
- Senior Center



AAA Implementation Project

- Area Agency on Aging interested in implementing the OEP in Oregon
- Frail, home-bound high-risk population
- Limited resources and limited # of PTs in the area
- Opportunity for collaboration



OEP Community Model

- AAA contracted with a Certified Occupational Therapy Assistant (COTA) and administered the program
- COTA performed initial and 2 follow up visits
- Personal Trainer provided monthly sessions for up to 6 months
- COTA & Personal Trainer provided weekly (first 8 weeks) and then monthly phone calls
- PT available as consult and met weekly with COTA and Personal Trainer

Community Vs. Traditional

	n	Community OEP				US OEP				P for Difference between Groups	
		Adjusted Mean Change (±SE)	Odds Ratio	P	Effect Size	Adjusted Mean Change (±SE)	Odds Ratio	P	Effect Size		
Change TUG	60	-6.55 (±1.46)	--	<0.001	0.59	54	-2.80 (±1.77)	--	0.116	0.25	0.105
Change 30-Second	60	1.54 (±0.42)	--	<0.001	0.44	50	1.75 (±0.56)	--	0.002	0.50	0.778
Stage 3 or 4 four stage balance	59	--	1.97	0.013	--	55	--	4.44	<0.001	--	0.090
Very/Mostly satisfied with physical activity	57	--	3.04	0.002	--	42	--	5.24	<0.001	--	0.327
Feel confident not falling (strongly agree or agree)	60	--	4.84	<0.001	--	42	--	5.34	<0.001	--	0.869
Never/seldom restrict activities	60	--	3.25	<0.001	--	42	--	2.81	0.008	--	0.756

Summary

- Similar outcomes when OEP is administered by non-PTs under the oversight of a physical therapist
- General Themes
 - Doing the exercise is the most important thing
 - Barriers to implementation are system-based NOT programmatic

Community-based classes

- Physical Therapist lead
 - High-risk older adults in community settings (adult day health, PACE)
 - Class size limited to the number which can be safely monitored
- Exercise Professional lead
 - Offer classes in conjunction with PT to fulfill HEP requirement
 - Senior Centers, Community Centers, ALF
- Peer lead
- No specific guidance on number of participants or curriculum
- Recommended**
 - Offer all exercises and have participants monitor challenge
 - Include a walking program

Peer-Lead Classes – Steady As You Go

- Starts with a 10 week program lead by a health professional
 - 1 hour class
 - 1/week
- 2 class participants identified as peer leaders
 - Complete health and safety training
 - Complete train the trainer training
 - Assume responsibility of running the class
- High rates of participate retention, adherence and compliance
- Higher rates of walking
- Lower fall incidence

Mild Cognitive Impairment and Dementia

Current Status

- OEP Implementation Guidance Statement – National Council on Aging
- <https://www.ncoa.org/wp-content/uploads/2017-OEP-Guidance-Statement.pdf>

Guidance Statement

<p>Older Exercise Program Guidance Statement</p> <p>The purpose of this document is to provide information and guidance regarding implementation of the Older Exercise Program (OEP) in accordance with Community Care for the Elderly program #10 after community-based organizations implementing OEP.</p> <p>Older Exercise Program Overview and Original Research</p> <p>The Older Exercise Program (OEP) was developed and tested by Dr. John Campbell and Dr. David Reardon at the University of Illinois, Urbana-Champaign. The program is a community-based exercise program for older adults (65+) that is designed to improve physical function and reduce the risk of falls. The program is based on the research of the original research team and is supported by the National Institute on Aging (NIA) and the National Center on Aging (NCA).</p> <p>The OEP is a community-based exercise program for older adults (65+) that is designed to improve physical function and reduce the risk of falls. The program is based on the research of the original research team and is supported by the National Institute on Aging (NIA) and the National Center on Aging (NCA).</p> <p>Implementation Guidelines</p> <p>The OEP is a community-based exercise program for older adults (65+) that is designed to improve physical function and reduce the risk of falls. The program is based on the research of the original research team and is supported by the National Institute on Aging (NIA) and the National Center on Aging (NCA).</p> <p>Target Audience</p> <p>The OEP is a community-based exercise program for older adults (65+) that is designed to improve physical function and reduce the risk of falls. The program is based on the research of the original research team and is supported by the National Institute on Aging (NIA) and the National Center on Aging (NCA).</p> <p>Participation Requirements</p> <p>The OEP is a community-based exercise program for older adults (65+) that is designed to improve physical function and reduce the risk of falls. The program is based on the research of the original research team and is supported by the National Institute on Aging (NIA) and the National Center on Aging (NCA).</p>	<p>Older Exercise Program Guidance Statement</p> <p>The key modifications of the OEP program include:</p> <ul style="list-style-type: none"> The program can be delivered in the home, outpatient clinic, or community setting. The program can be delivered by a PT or a Physical Therapy Assistant (PTA) and reimbursed by Medicare as long as the participant meets the requirements for physical therapy under Medicare Part A, B, or C. The program can be delivered by a community-based organization (by an individual with an exercise background and experience working with older adults). <p>Implementation Guidelines</p> <ul style="list-style-type: none"> The program can be delivered in the home, outpatient clinic, or community setting. The program can be delivered by a PT or a Physical Therapy Assistant (PTA) and reimbursed by Medicare as long as the participant meets the requirements for physical therapy under Medicare Part A, B, or C. The program can be delivered by a community-based organization (by an individual with an exercise background and experience working with older adults). <p>Target Audience</p> <p>The program is designed for older adults (65+) who are at risk of falls and have difficulty with walking. The program is based on the research of the original research team and is supported by the National Institute on Aging (NIA) and the National Center on Aging (NCA).</p> <p>Participation Requirements</p> <ul style="list-style-type: none"> Attend approximately 5 sessions over 8 weeks. Complete their OEP plan up to 30 minutes/day, three days/week. Complete their walking program up to 30 minutes/day, three days/week. Recommended 6 month participation or transition to a more challenging community-based program.
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US Modifications

- Implement in the home, outpatient clinic, or community setting
- Participants can exercise on their own, in a class, or using online applications, videos, or virtual programs
- Participants can use a variety of tools to track participation rates and progress

US Modifications

- Delivered by a PT or a Physical Therapy Assistant (PTA) and reimbursed by Medicare as long as the participant meets the requirements for physical therapy under Medicare Part A, B, or C
- Required 8 week participation with a recommendation of a minimum of 6 months
- Delivered by a community-based organization (by an individual with an exercise background and experience working with older adults)

Participation Requirements

- Attend approximately 5 sessions over 8 weeks
- Complete their OEP plan up to 30 minutes/day, three days/week
- Complete their walking program up to 30 minutes/day, three days/week
- Recommended 6 month participation or transition to a more challenging community-based program

FIDELITY MANTRA

- DO THE EXERCISES
- DO NOT MODIFY EXERCISES

Fidelity

- Meeting with the participant five times over the first eight weeks of the program, in either one-on-one or group sessions
- Insuring the participant is challenged throughout the program
- Insuring the participant has access to ankle weights
- Supporting participant adherence and compliance

Where to next?

- What is the value of the OEP to a physical therapy practice?
- How can we implement the OEP in a cost-effective way?
- What does the future look like?

Is Otago For You? Where to start....

- What is your practice setting?
- What are your resources?
- Which model should you implement?
- Who are your champions?
- What is your plan?

Is Otago For You? The harder questions....

- Your mission and community presence
- Current market share
- Community (Senior/Disabled Services) connections
- Geographical reach
- Part-time staffing/flex
- Front office coordination
- Billing for team meetings
- Patient copays
- Consistent approach without regard to payer
- ROI per patient
- Increased referrals

Reflections

- Fall Risk Management Requires a Village
 - Every team member has a role if not an active intervention
 - Important to engage with new partners and take on new roles that allow us to practice at the top of our license
- Our patients need to understand falls risk is a chronic condition
- Our patients need access to the tools available to keep them on our feet (it is a moral imperative)

Future Directions

- More research is needed!
 - Not on efficacy – on IMPLEMENTATION
 - More innovation in delivery models
- Need more implementation experts
- More PTs need to partner with state agencies
- More groups willing to take a chance and engage with new partners

Appendix

- Motivational Interviewing + OEP
 - ▶ Older adults who participated in the OEP + MI groups 2.4 times as likely to achieve adherence goals to the OEP at one year (Arkkukangas, 2018)
- SNF Group-based intervention (Kocic, 2018)
 - ▶ 10 individuals/group
 - ▶ 5-7 minutes of warm-up; 30-35 minutes of balance training; 5-7 minutes of walking; an additional 30 minutes 2x/week for walking
 - ▶ 2 PTs/session – one for teaching and one for safety
 - ▶ 3 times/week
 - ▶ High adherence and compliance in exercise group
 - ▶ Significant improvements in strength and balance measures

Thank You!

- CDC FETA Team
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