

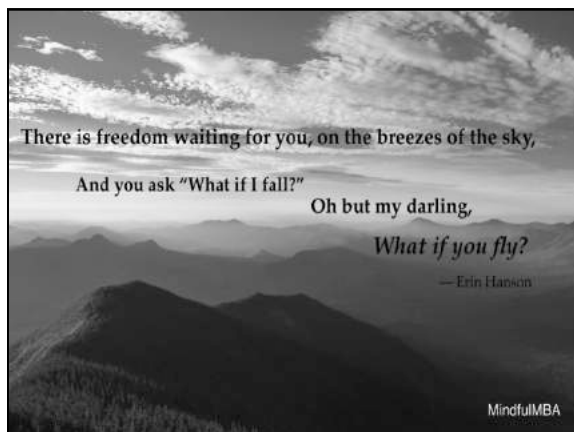
Safegait Interventions

J.J. Mowder-Tinney PT, PhD, NCS, CSRS, CEEAA
jmowder3@naz.edu

Season Bonino PT, GCS
sbonino4@naz.edu

Learning Objectives

- Describe the 'Basics' about the use of Unweighted Harnesses.
- Review research studies completed with utilizing the SafeGait® as part of the intervention plan.
- Compare and contrast different options available for providing efficient and progressive interventions utilizing the SafeGait® system.



Changing the Focus of our Treatments

- ❖ Eliminate fear, allow patient to focus on task at hand
- ❖ Practice everyday activities that otherwise are too difficult to attempt, or would require multiple therapists to complete safely
- ❖ Eliminate need for therapist to provide fall control – allow therapist to focus on facilitation of movement
- ❖ Increase the level of challenge, resulting in improved results in shorter amount of time

Body Weight Support It's About More Than Gait

- ❖ Pre-gait activities
- ❖ Sitting posture and balance (therapy balls, compliant surfaces)
- ❖ Balance board/standing activities
- ❖ Sit to Stand
- ❖ Quadruped/Tall Kneel/Half Kneel
- ❖ Floor to Stand
- ❖ Balance Reactions
- ❖ Where does your creativity take you????



Harness System “BASICS”

- ❖ Balance – eliminate falls, focus on task
- ❖ Alignment – encourages fully upright posture
- ❖ Strengthen – allows functional activities sooner
- ❖ Improved endurance – More reps, more active sessions
- ❖ Control – Allows therapists to facilitate better quality of movement
- ❖ Skill acquisition – promotes motor learning

Balance

- ❖ Patient - Eliminate fear of falling means:
 - Decreased overall tone
 - Decreased cardiovascular response
 - Decreased fatigue
 - Increased energy for other activities
- ❖ Therapist -
 - Eliminates therapist need to solely provide safety
 - Can focus on task performance versus “fall free” activity
 - Focus shifts to quality of movement
 - Decreased physical strain on therapist

Alignment

- ❖ Encourages upright sitting and standing posture while minimizing need for facilitation
- ❖ Better quality of movement
- ❖ Better posture – more energy efficient

Strength

- ❖ Allows for earlier increased level of challenge to musculoskeletal and cardiovascular system
- ❖ Assists in getting patients that may not be strong enough to sit/stand independently upright sooner, encouraging functional strengthening earlier
- ❖ Allows for progression to transfers, bed mobility, standing, and ambulation activities earlier than may be possible with only therapist assist

Improved Endurance

- ❖ Patients tolerate more repetitions, increased time in weight bearing positions
- ❖ Decreased stress to cardiovascular system due to patient “lifting” less weight (ie. A 150 lb woman only having to control 120 pounds of weight)

Control

- ❖ Improved quality of movement, including timing, symmetry, coordination of force
- ❖ All of this is impacted by better balance, alignment, strength and improved endurance
- ❖ Easier for therapist to provide hands on facilitation of movement
- ❖ Challenge patient control safely outside of BOS, improving balance reactions
- ❖ Allows for part task to whole task practice

Skill Acquisition

- ❖ Decreased requirements, and demand on musculoskeletal and cardiovascular system allows for increased repetitions
- ❖ Increased repetitions lead to improved motor learning and motor control of functional tasks
- ❖ Improved motor control leads to faster acquisition of skills including transfers (sit to stand and floor to chair), gait, and balance

Nazareth College PT Clinics – an opportunity for us to use unweighted harness technology

- ❖ Neuromuscular
 - ❖ Orthopedic
 - ❖ Multiple Sclerosis
 - ❖ Prosthetics and Orthotics
- ❖ Open to the public for care, by appointment
 - ❖ Offer services, free of charge to adults with varying abilities and needs who are underserved or require supplemental services
 - ❖ Run during fall and spring semesters

What system do we use?



- SafeGait 360 by Gorbelt Medical
 - Ceiling-mounted dynamic Body-Weight Support (BWS) and Fall Protection system
 - An overhead actuator unweights, protects and moves with the patient as they practice average daily living activities
 - Measures time, distance, repetitions, falls prevented, average BWS and speed
 - Can be used for gait training, transfers training (sit to stand, bed mobility, floor to stand), quadruped, tall kneeling, treadmill training, dynamic and static balance activities, and more

Neuroplasticity

- The brain changes both anatomically and physiologically with resultant changes in:
 - Growth of new connections
 - Membrane excitability
 - Unmasking of pre-existing connections



Key Aspects of Promoting Neuroplasticity

Task-Specific

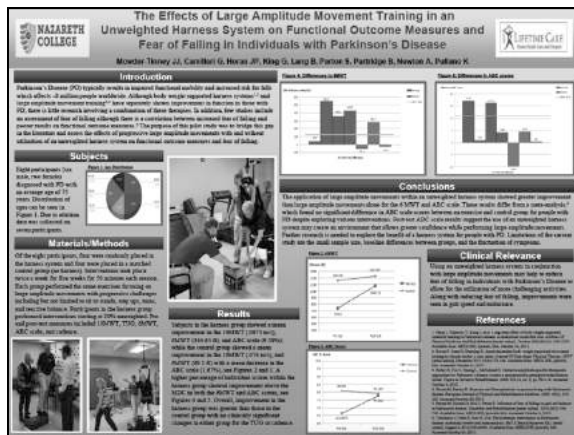
Relevant and interesting to the patient

High Repetition

Repetition, repetition, repetition with meaning and motivation

Challenging

Using a problem-based learning situation that uses the environment to promote active participation of the patient



Results

- Large amplitude movements had better outcomes in the 6MWT and ABC scales for the group in the SafeGait® compared to the group doing the same movements outside the harness.



Large Amplitude Movements for PD

- Lee Silverman Voice Treatment BIG certification
 - 1) Strict protocol focused on sitting/standing/walking
 - 2) <https://www.lsvtglobal.com/>
- Parkinsons Wellness Recovery PWR!
 - 1) Includes prone/supine/quadruped/sitting/ etc
 - 2) <https://www.pwr4life.org/>

Intervention Techniques

- Large amplitude movements are not limited in the system
 - Some movements were from LSVT/PWR! Training
- Increased ability to provide observation



Impact of Fear

- SafeGait® Dynamic Fall Protection, (DFP)
- Can make appropriate challenging adjustments while doing any functional activity without fear of having to determine the distance.



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- An intervention plan utilizing a motivational component in conjunction with a somatosensory based reactive balance training program may be beneficial in people with cerebellar deficits.
- Improvements noted in TUG and FGA with slight improvements noted in the Four Square Step Test and the SARA.

- Task specificity is key
- Need to focus on motivational activities
- Allow error (in a safe environment) to have the patient learn to self correct

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Results – Clinical Outcome Measures

Outcome Measure	Initial Eval	Discharge
Dynamic Gait Index	15/24	17/24
Five Timed Sit to Stand (sec)	23.9	15.8
Six Minute Walk Test (feet)	734	913*
Activities-Specific Balance Confidence Scale (ABC)	43.8	73.8*
Timed Up and Go	17.1	12.7
Falls Per Week	2-3	0 final three weeks

How Did Those Changes Happen?

- Remember
 - 1) Chronic diagnosis
 - 2) Plateaued in physical therapy attending 2x/week
- CHALLENGE!

Learning to Self Correct

SafeGait® Dynamic Fall Recovery

- 1) Important to recover at their own pace and learn to self-correct and retrain automaticity
- 2) Ability to add increased opportunity to allow error
- 3) Allow the patient to recover at their own speed for them to learn so they can make the self-correction in the future
- 4) All of this is done in a safe environment



Inoculation of Falls

- Studies done by Bhatt and Pai have found the following results from their repeated slip (RS) training studies:
 - 1) RS improve the control of stability
 - 2) RS improve limb support against collapse
 - 3) The effects achieved in a single session can reduce community-living older adults' everyday risk of falls by 50% in the subsequent 12 months.

1. Pai YC, Bhatt T, Wang E, Espy D, Pavol MJ. Inoculation against falls: rapid adaptation by young and older adults to slips during daily activities. *Archives of physical medicine and rehabilitation*. 2010 Mar 1;91(3):452-9.
2. Pai YC, Yang F, Bhatt T, Wang E. Learning from laboratory-induced falling: long-term motor retention among older adults. *Age*. 2014 Jun 1;36(3):9640.
3. Yang F, Bhatt T, Pai YC. Generalization of treadmill-slip training to prevent a fall following a sudden (novel) slip in over-ground walking. *Journal of biomechanics*. 2013 Jun 4;46(1):63-9.

Treatment Strategy - Reactive Balance

- Train stepping on the good side for someone with a stroke until hip abductors are strong enough.
 - 1) Reactive stepping: Side stepping, backward stepping, forward stepping
- Start training with just stepping in/out and forward/backward.
 - 1) Can perform on a ramp
- Progress to resisted stepping with theraband
- Turn the treadmill on and off in all directions
- Slip trainer



Clinical Takeaways

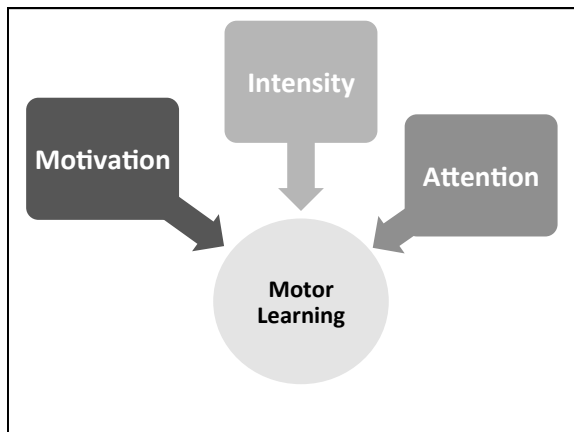
- Reactive Balance training is critical
- Retrain slips/trips and side to side stepping reactions with community elderly and neuro patients

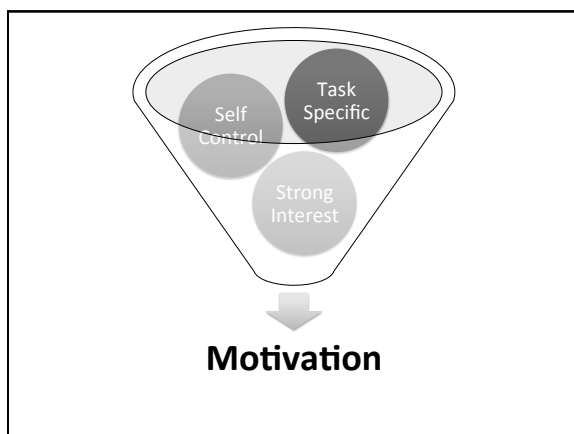
Why Aren't They Getting Any Better?

- **REFLECT**

- 1) Take a step back and ask if you are getting what you want. Do you know what it is you want to get? Are you getting it? OR is it the wrong thing?

- If you are focused on the right thing then what is M.I.A. from your session.





MOTIVATION IS KEY

- If the activity doesn't mean anything to them and is not functional (tapping dots on floor, being given perturbations in sitting, sitting marching, etc). How do those things challenge and motivate them to be functional?

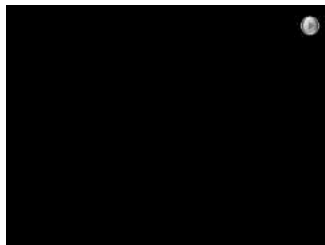
Self Control

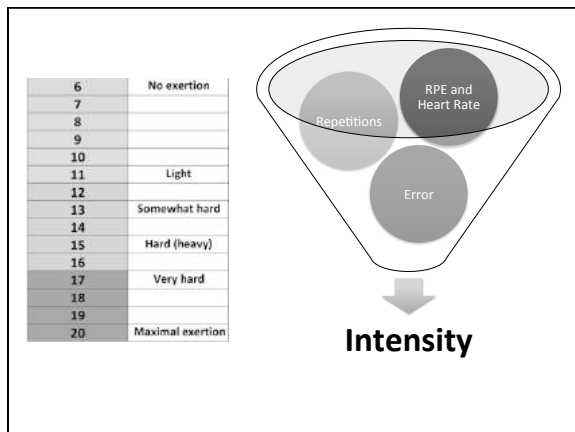
- Providing the patient some aspect of control during an intervention enhances motor learning.
- When possible limit externally imposed conditions and have the patient adjust the situation parameter
 - 1) Let them determine the distance, the repetitions, how to increase challenge

Andrieux M, Danna J, Thon B. Self-control of task difficulty during training enhances motor learning of a complex coincidence-anticipation task. Research quarterly for exercise and sport. 2012;83(1):27-35.

Task Specific

- Ask the patient
"What three things do they want to work on the most?"
- Have early and often success





Intensity

- The literature has shown that optimizing the patient's aerobic capacity leads to improved outcomes.
 - Vital Zone! Real time feedback to cue you where they are for HR.
 - Constant ability and cues to monitor RPE

Enter Patient Height and Weight

Height (in)

Weight (lbs)

Age

Resting Heart Rate

Intensity

- Therapists understand the positive functional change that occurs when patients are optimally challenged.
- To facilitate higher intensity rehabilitation in practice therapists need access to appropriate resources.

Set Patient Goals

TIME

PATIENT GOALS

DISTANCE (mi)

HEART RATE

☒ 40-50%

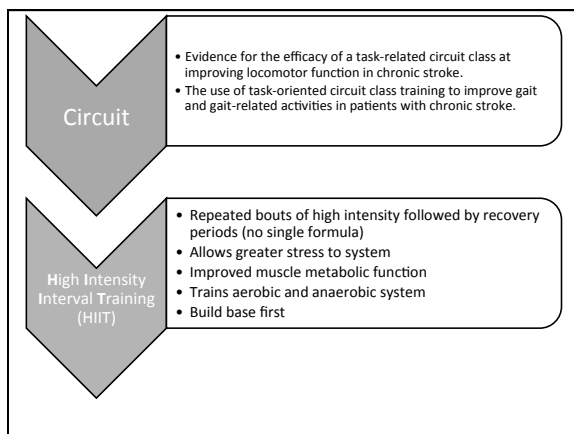
☐ 50-60%

☐ 60-70%

☐ 70-80%

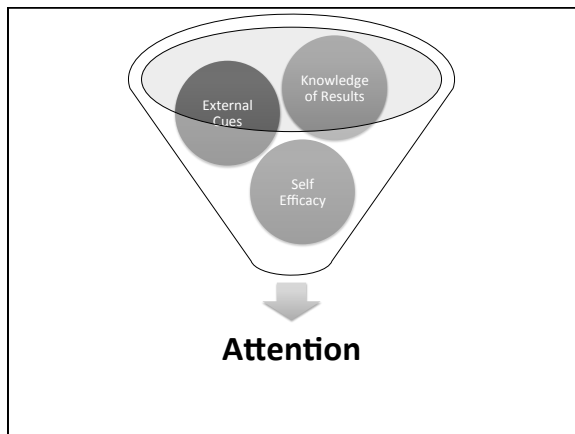
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Knowledge of Results

- Allows monitoring of number of repetitions
- Distance
- Time
- Percentage of body weight support

External Cues

- Allows increased flexibility to utilize external cues
- Utilize sensitivity to increase use of eccentric control
- A safe way to increase the use of external cues like boxing gloves



Self Efficacy

- A recent study found verbal cues were common. Approximately one verbal instruction or feedback statement was given every 14 seconds.
 - 1) Unfocused statement such as “good” were regularly used.
- In addition, 67% of cues by therapists were internally focused, while only 22% were externally focused.

❖ Johnson L, Burridge JH, Demain SH. Internal and external focus of attention during gait re-education: An observational study of physical therapist practice in stroke rehabilitation. Phys Ther. 2013;93:957-966.

Switch Your Attention

- Focus less on YOU trying to figure out the best thing to say and focus your attention on the patient and what THEY say about the activity



Questions to promote self-efficacy

- How could we make it harder?
- How many times can you do this before your legs get tired?
- How much longer can you walk before fatigued?
- Do you feel your balance is challenged? (use self perceived stability chart)
- What do you want to do today?
- Which circuit items? Number of circuit items?
- Which device to use?
- Choose order of activities?
- Choose items for obstacle course?

Don't get stuck in the mud



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