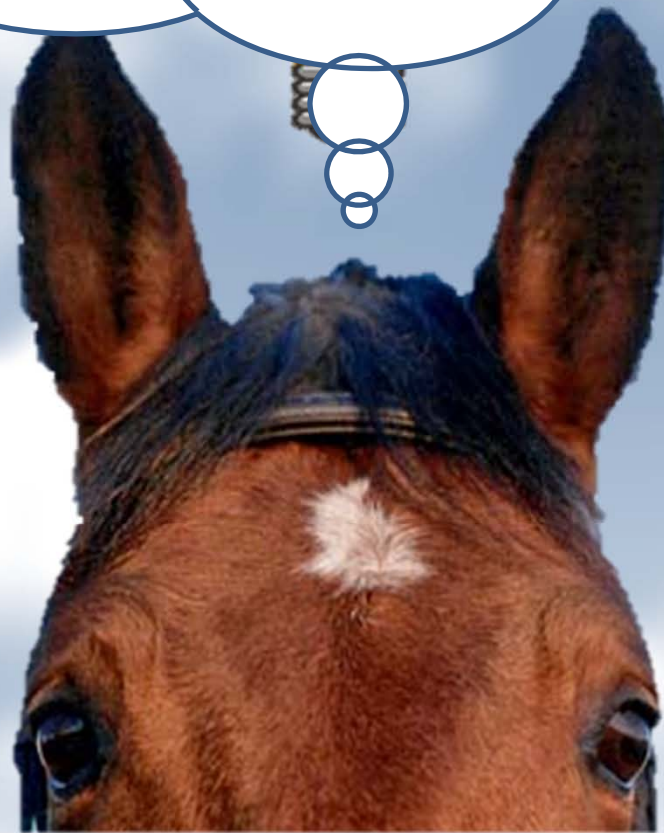
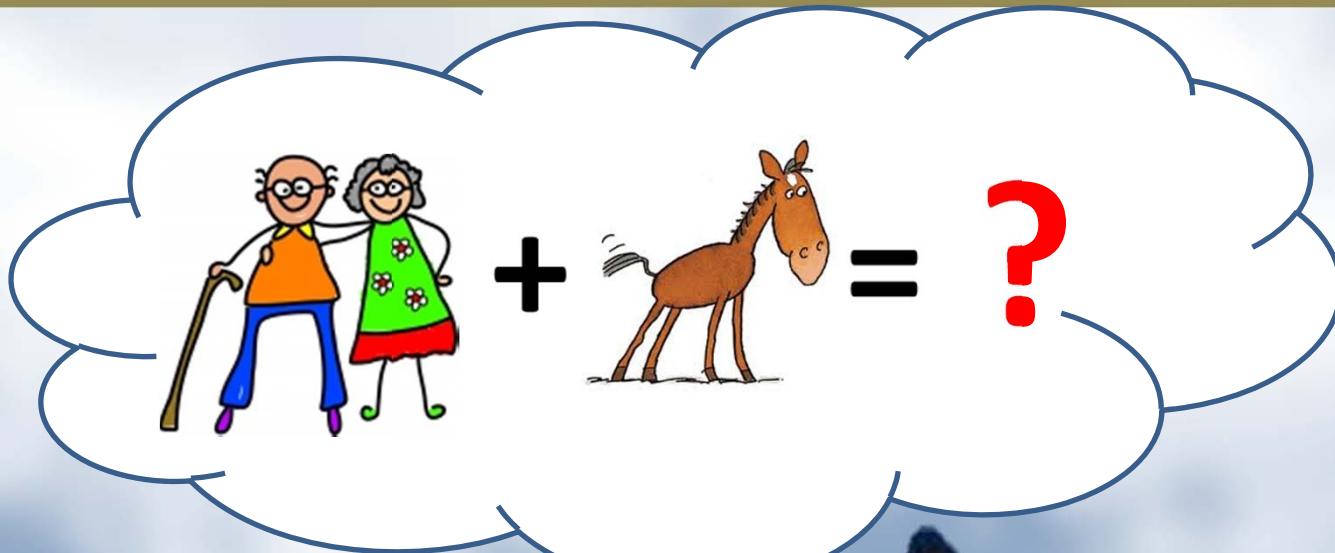


The effect of therapeutic horseback riding on balance in community-dwelling older adults

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Made possible by the Cheff Therapeutic Riding
Center, Augusta, MI
And Michigan State University, Kalamazoo, MI



The Idea



The Literature Review

i.e.

“The Homework”



**33% of Seniors
experience at least
one fall per year.¹**

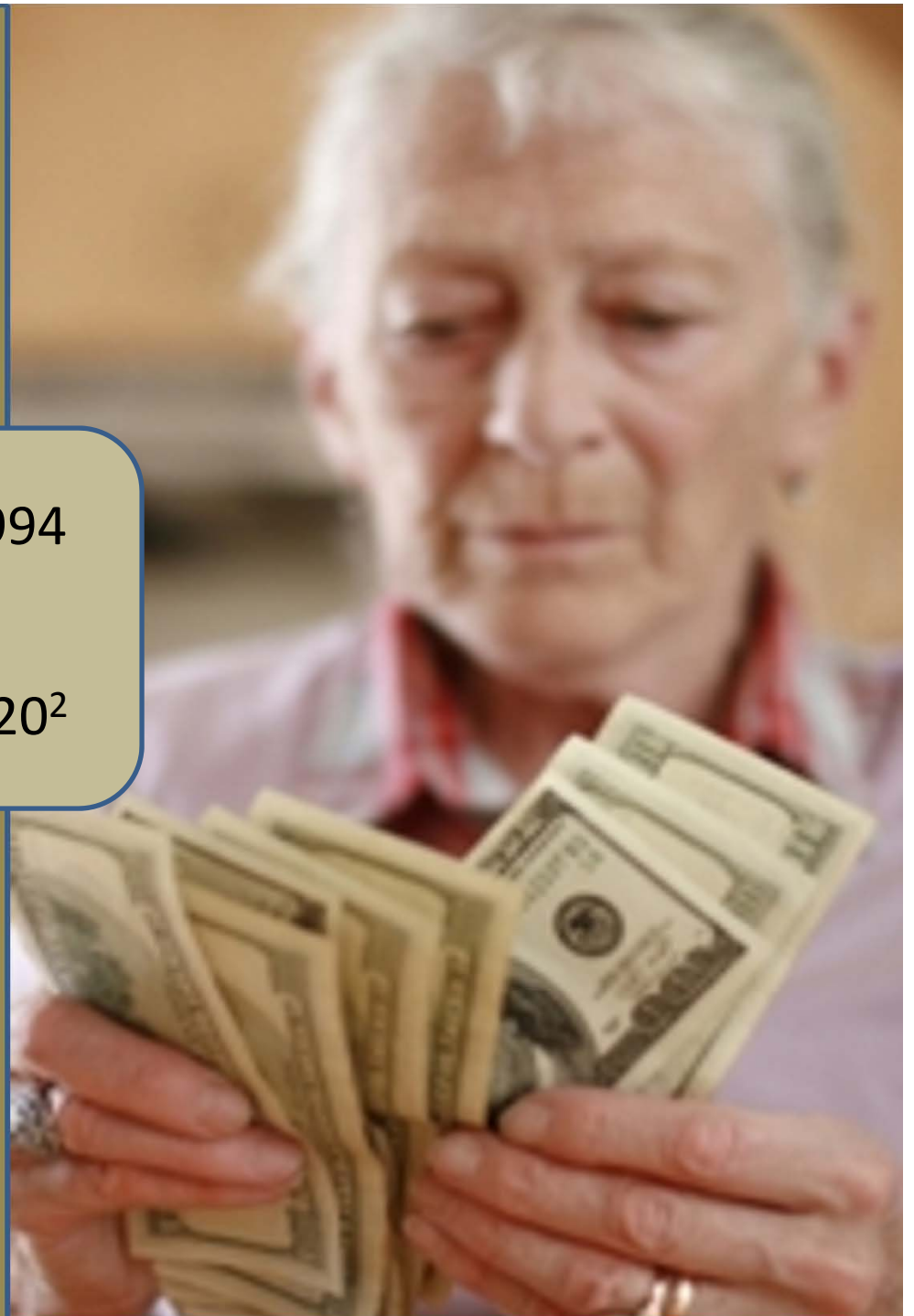
Fall related costs
are astounding.

\$20.2 Billion in 1994

Projected to reach

\$32.4 Billion in 2020²

Quality of life can
greatly decrease





An impairment in balance triples the fall risk.³

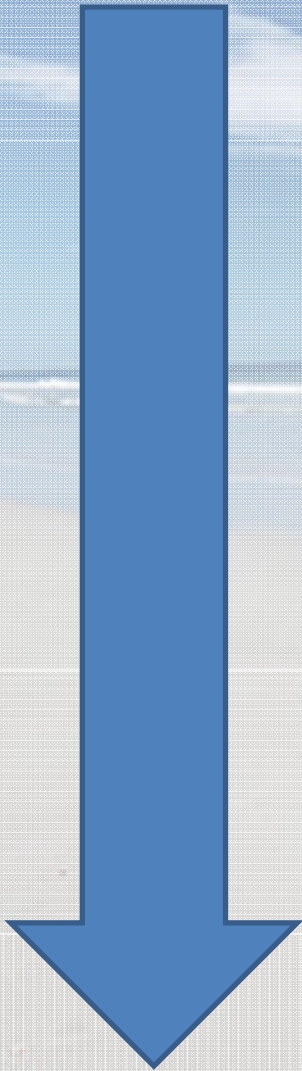
Identify
Early

Manage
Medically

Modify
Environment

Exercise

To **decrease**
fall risk:



Exercise Programs



Lead to faster **postural reflexes**, improve **balance** and **mobility**, and result in **fewer falls.**



Cochrane Database Review (Howe et al. 2008) of exercise and balance

- **34 studies of exercise interventions leading to statistically significant improvements in balance compared to usual activities**
 - 2883 participants
 - Average age ranged from 60-75 years
- **Exercises involved**
 - **Gait**-Walking, heel-toe walking, tandem walking, etc.
 - **Balance**-Standing on one leg, repeated stand ups, step ups, etc.
 - **Coordination**-Ball throwing, standing and bending in different directions, etc.
 - **Muscle strengthening**-Resistance training, stair climbing with resistance, etc.

AAANNND... The
results of 34
Cochrane Database
studies concerning
exercise interventions
confirm...



“Exercise has a statistically significant positive effect on balance as opposed to usual activity in older people.”



Equine Assisted Therapy and Recreational Riding

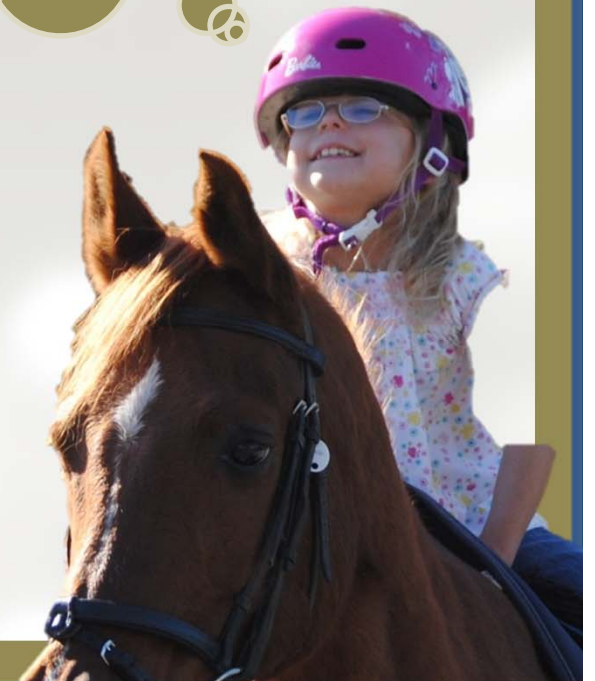


IMPROVES

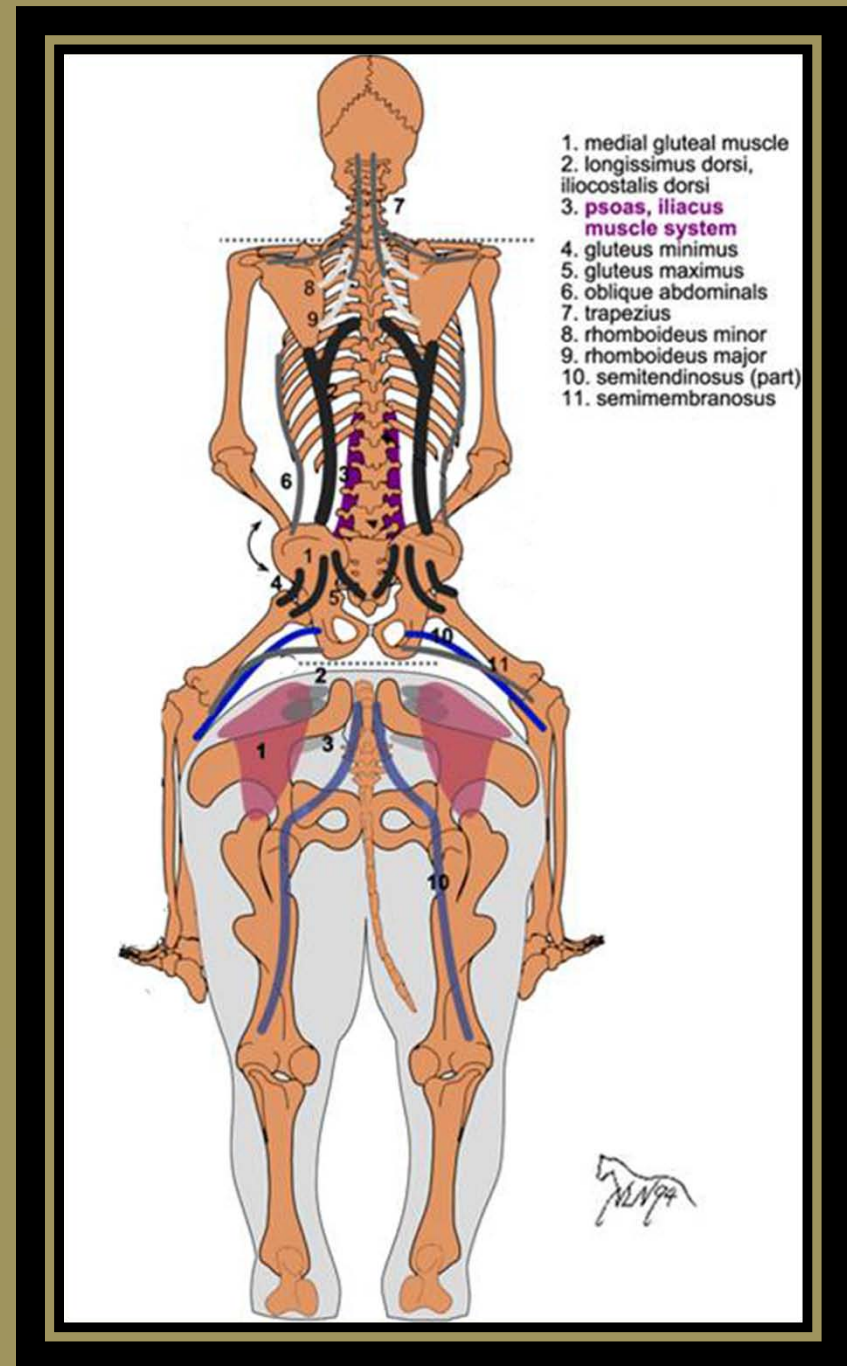
- Balance in children with developmental delay¹³
- Dynamic postural stabilization*
- Joint stability*
- Muscle co-contraction*
- Postural responses*
- Equilibrium responses*
- Gross motor function*

Are FUN and healthy
exercise!

*10,11



“The exact physiologic basis for functional improvements is not known but is thought to involve three dimensional transmission of the horses motion to the patients body requiring both neural and musculoskeletal responses.⁷”



The Study

The effect of therapeutic horseback riding on balance in community-dwelling older adults




A single blind **pilot study** to evaluate the **effect on balance** of a ten week **therapeutic riding** course versus the usual activities in 20 community dwelling **adults over the age of 65**

Study Design



- **Age and gender matched single blind (balance tester, statistician) comparative trial**
- **Intent to enroll 10 TR and 10 controls**
- **Balance testing to be done at start and end of study**

 Study protocol was approved by the Bronson Methodist Hospital Review Board (Kalamazoo, MI)



Inclusion Criteria



- 65 Years or Older
- Be able to understand instructions for balance testing and therapeutic riding
- Be able to complete health history and activities questionnaire
- Be able to provide physician approval
- Be able to provide informed consent
- Be able to commit to 2 balance tests (and) 10 consecutive weeks of once-a-week riding sessions

Exclusion Criteria

- Chronic condition known to affect balance
- Chronic condition that would put subject at risk from horseback riding
- History of substance abuse
- Intake of over 1.5 oz. of alcohol per day
- Fear of horses
- Current recreational horseback riding or previous therapeutic riding instruction within one year of enrollment



Each subject had a **health screening** and an **activity level assessment** prior to starting the study.



Subject name: _____

Obtained (circle): Telephone In person

Date: _____

Please indicate yes or no to the following questions:

Have you ever been diagnosed by a doctor with the following conditions?:

Multiple Sclerosis	yes	no
Parkinson's Disease	yes	no
Stroke	yes	no
Middle ear disorder (vertigo)	yes	no
Brittle bones (osteogenesis imperfecta)	yes	no
Thin bones (osteoporosis)	yes	no

In the last one year have you had?:

Dizzy spells?	yes	no
Tripping or falling resulting in injury?	yes	no
Do you take any medications that cause drowsiness or sleepiness?	yes	no
If yes, name of medication: _____		
Do you drink more than the equivalent of one glass of wine or one beer each day?	yes	no

Comments:



Health History





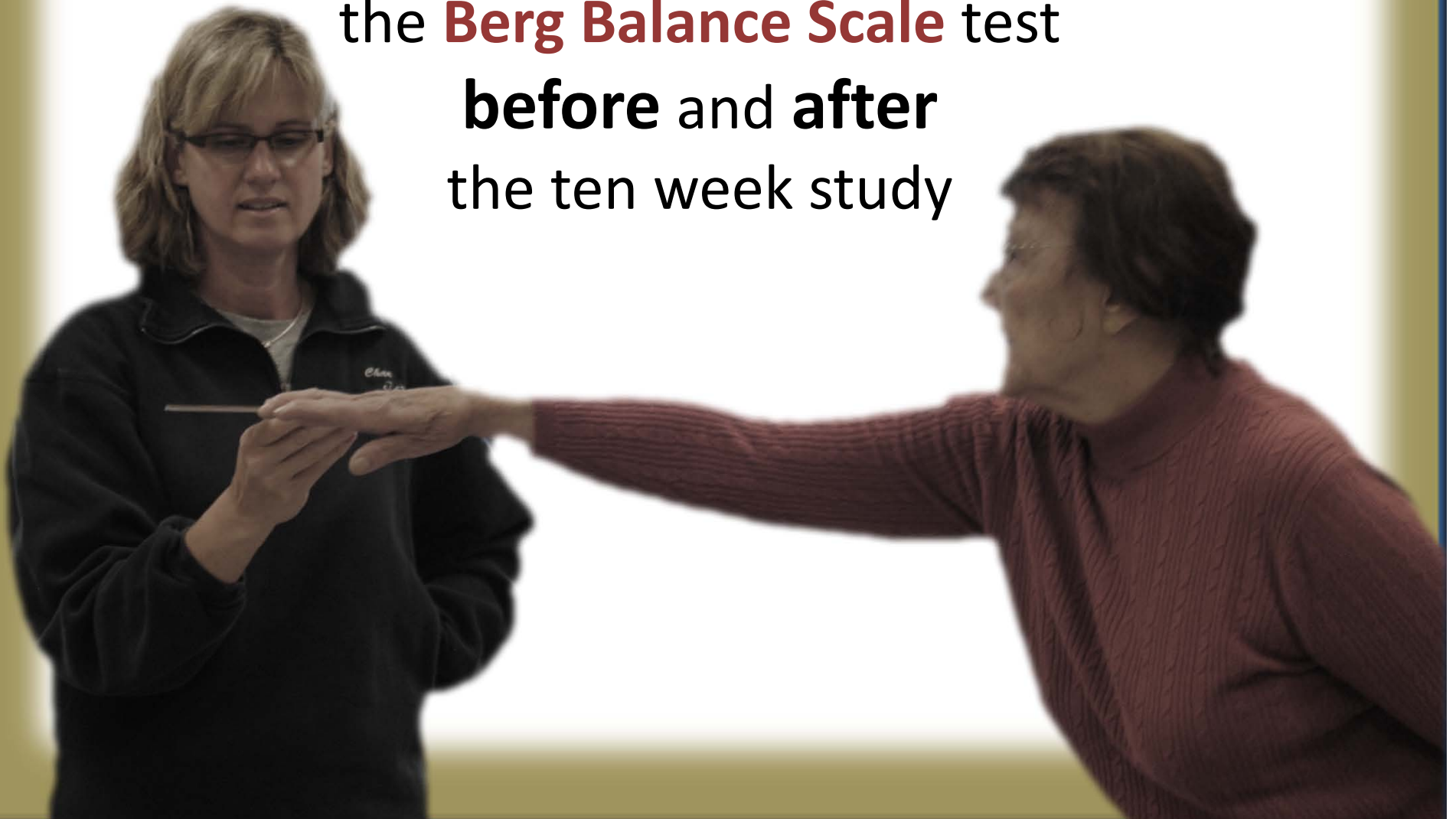
Complete Physical Function Scale (activity level screening)



Please indicate your ability to do each of the following by circling the number next to the activity (your response should indicate whether you are able to do these activities, not if you actually do the activities):

	<u>Can do</u>	<u>Can do with difficulty or help</u>	<u>Cannot do</u>
a. Take care of own personal needs like dressing yourself?	2	1	0
b. Bathe yourself using tub or Shower?	2	1	0
c. Climb up and down a flight of stairs.	2	1	0
d. Walk outside one or two blocks?	2	1	0
e. Do light household chores-like cooking or dusting, washing dishes, sweeping a walkway?	2	1	0
f. Shop for groceries or clothes?	2	1	0
g. Walk ½ mile (6-7 blocks)?	2	1	0
h. Walk 1 mile (12-14 blocks)?	2	1	0
i. Lift and carry 10 lbs. like a full bag of groceries?	2	1	0
j. Lift and carry 25 lbs. like a medium to large suitcase?	2	1	0
k. Do heavy household activities like scrubbing floors, vacuuming, raking leaves?	2	1	0
l. Do strenuous activities like hiking, digging in garden, moving heavy objects, bicycling, aerobic dance activities, strenuous calisthenics, etc.	2	1	0

Each participant took both the **Fullerton Advanced Balance Scale** test as well as the **Berg Balance Scale** test **before** and **after** the ten week study



Fullerton Advanced Balance Scale

- Standing with feet together, eyes closed
- Reaching forward to retrieve an object held at shoulder height
- Turn 360 degrees in a right and left direction
- Step up and over a 6 inch bench
- Tandem walk



Fullerton Advanced Balance Scale Cont.

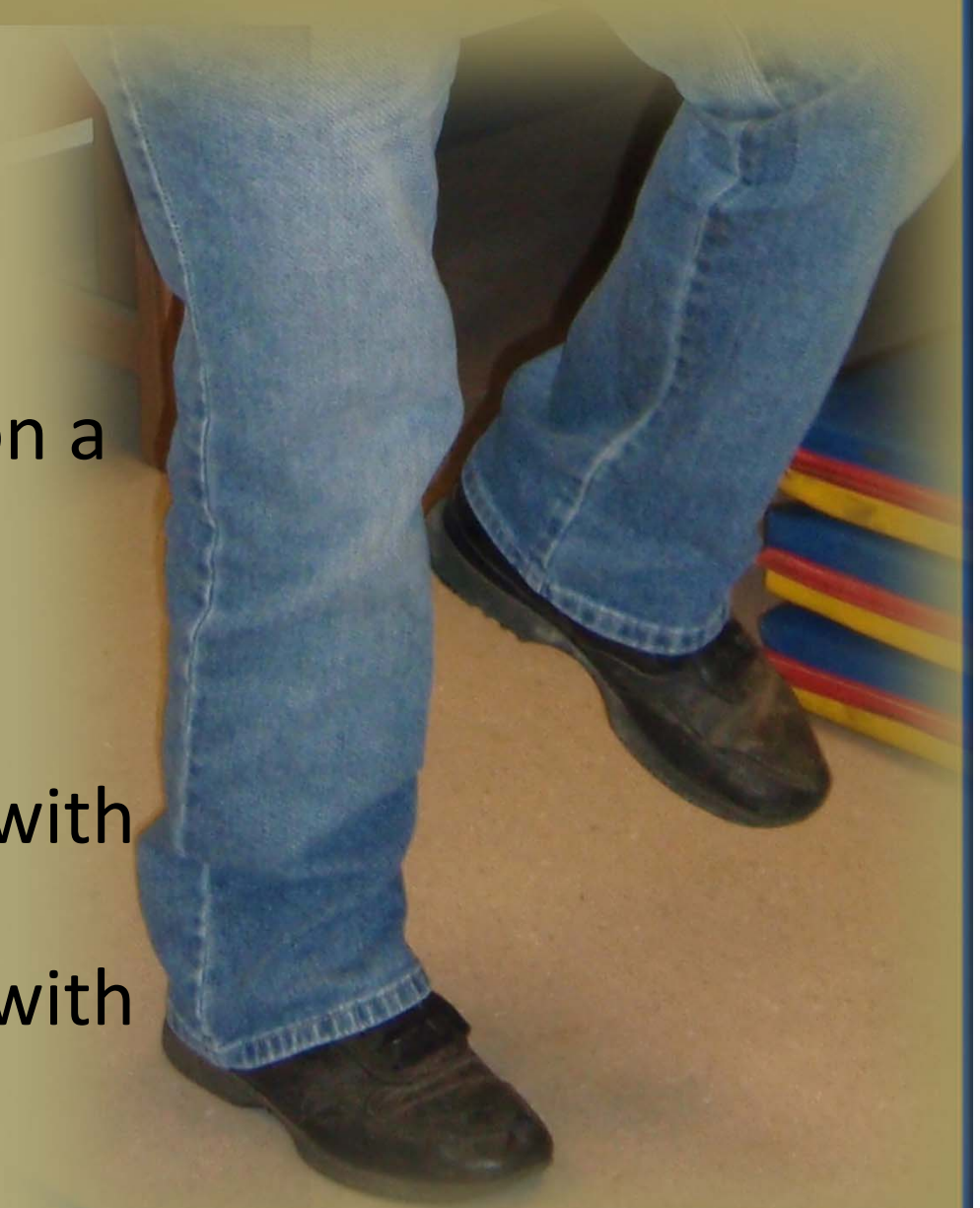
- Standing on one leg.
- Standing on foam with eyes closed.
- Two footed jump for distance.
- Walk with head turns.
- Reactive postural control.

Max. score = 40



Berg Balance Scale

- Sitting to standing
- Standing unsupported
- Sitting with back unsupported but feet supported on floor or on a stool
- Standing to sitting
- Transfers
- Standing unsupported with eyes closed
- Standing unsupported with feet together



Berg Balance Scale Continued

- Reaching forward with outstretched arm while standing
- Pick an object from the floor from a standing position
- Turning to look behind over left and right shoulders while standing
- Turn 360 degrees
- Place alternate foot on step or stool while standing unsupported
- Standing unsupported on one foot
- Standing on one leg

Max. score = 56



Results

9 subjects completed the Therapeutic Riding course
and **6 controls** completed balance testing

*2 additional controls were discontinued due to health reasons

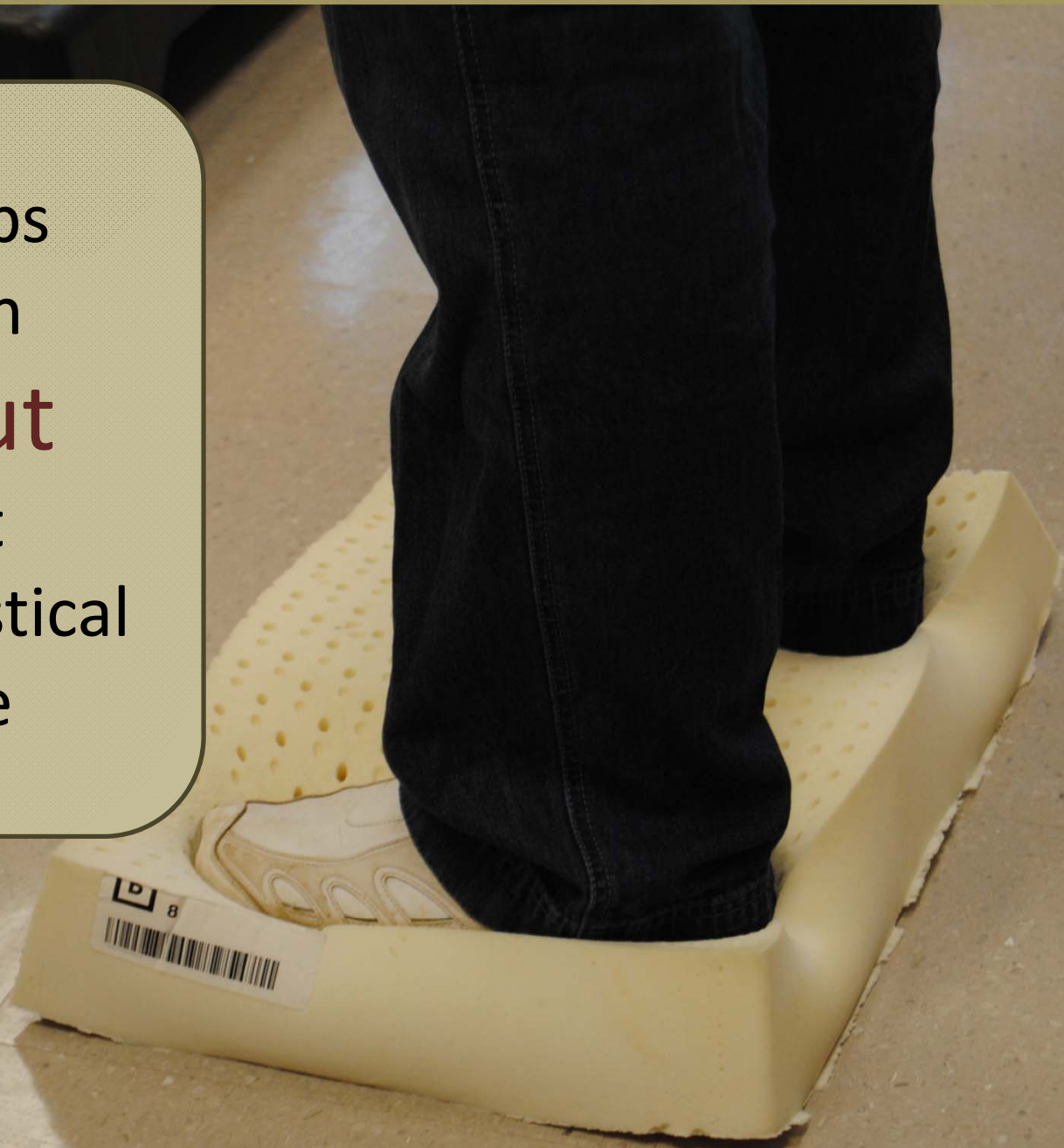


	TR	P value*	Controls	P value
Gender	7 f, 2 m		3 f, 3 m	
Age	70.1		69.3	
FABS	34.11 v. 36.0	0.153*	30.8 v. 34.0	0.148
BBS	55.3 v. 55.9	0.115	54.5 v. 54.7	0.931
Power Analysis (FABS)	44		12	
Power Analysis (BSS)	29		841	

*Mann Whitney



Both groups improved in balance **but** this did not reach statistical significance



Control Group Activities

"I Started going to the gym three times a week!"

"I Started walking my dog an hour a day!"

"I started attending salsa dancing class!"

"I practiced the test!"

"I am much more active in the summer!"



Other Problems Encountered

- Study started in season of normally increased activity in a healthy control group.
- The study and control group were too healthy.
- Administration of reproducible balance tests takes practice.
- No indication of any type as to a participants' performance on an individual balance test should be transmitted to the subject.
- Ten weeks may have been too long for optimal retention of subjects.

STUDY DESIGN ISSUES

- Larger study needed (power analysis)
 - Community controls needed?
- Balance testing uniformity and practice is needed for optimal measurements
- Should all stable neurologic conditions be excluded?
- Should subjects refrain from additional exercise activity during the study for “purity” of the intervention?
- Is ten weeks too long a TR course for study?



Conclusions

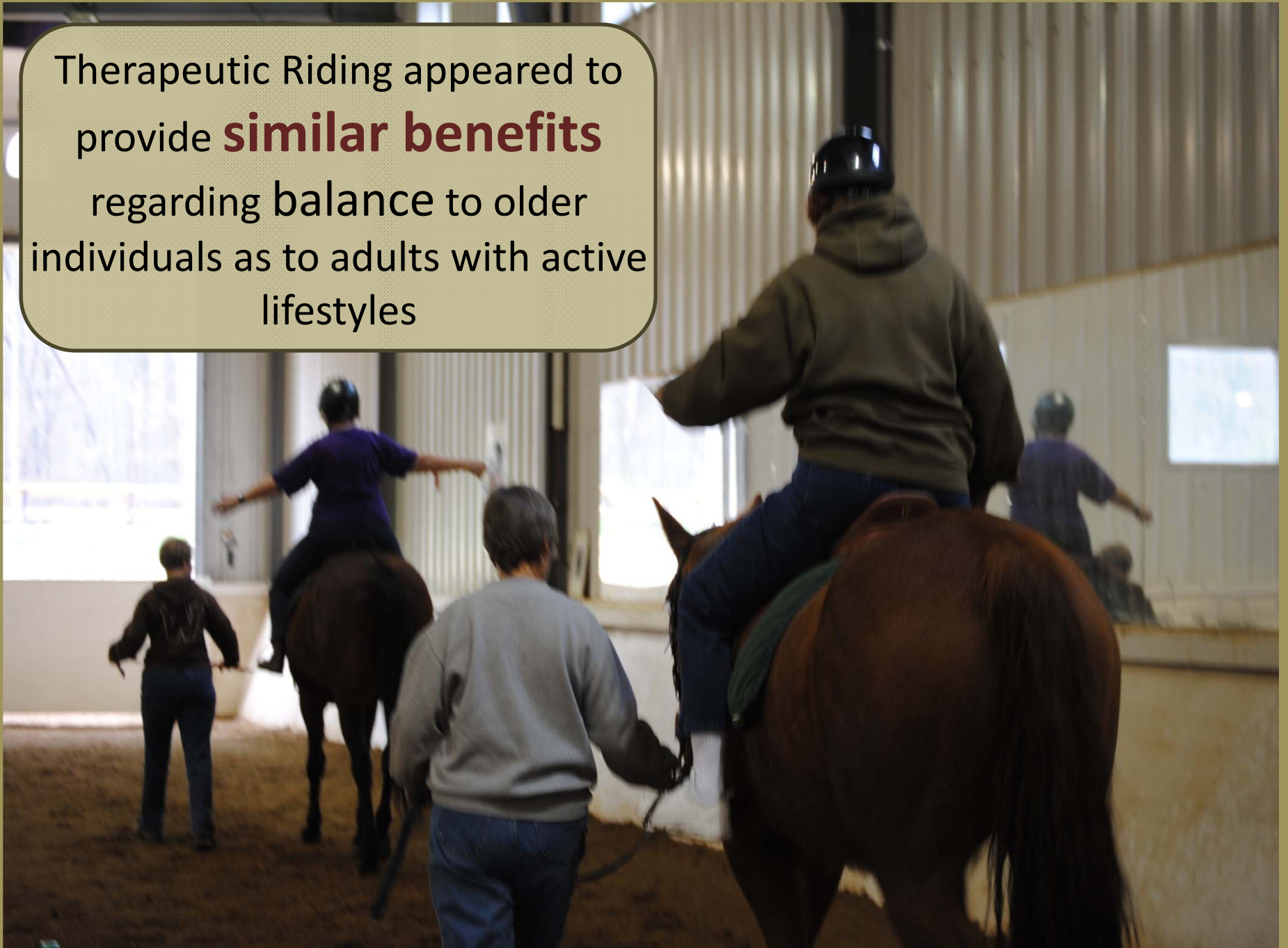
The **FABS** appeared to be **more sensitive**
than the BBS for assessing balance
in this study group



Therapeutic
Riding appears to
be a **SAFE** and
enjoyable
activity for
older
individuals



Therapeutic Riding appeared to provide **similar benefits** regarding balance to older individuals as to adults with active lifestyles



A **larger study group** would help define the role of Therapeutic Riding in improving balance in this and other groups



Future Directions

- Multicenter study of approximately 50-100 seniors
- Include patients with stable neurologic conditions
- Train all balance evaluators the same at the “source”
- Consider similar studies in patients with balance problems due to other conditions (e. g. stroke)



Questions?

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