

Fall Prevention Efforts at the University of Dayton

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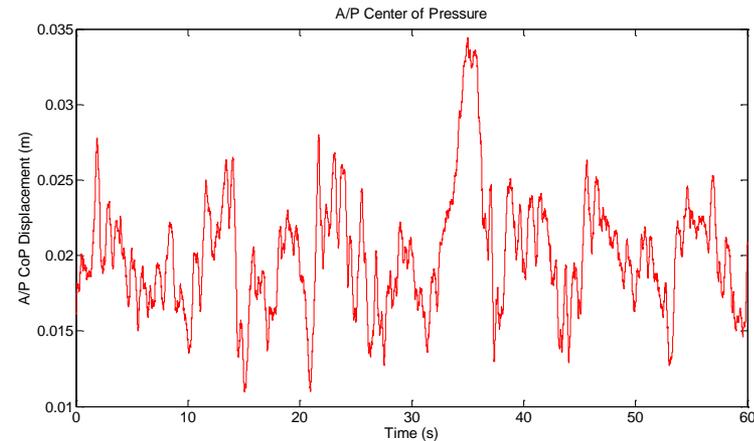
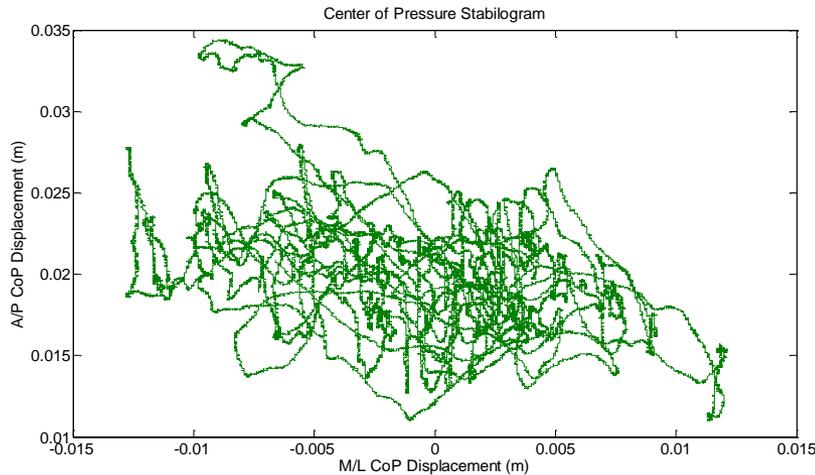
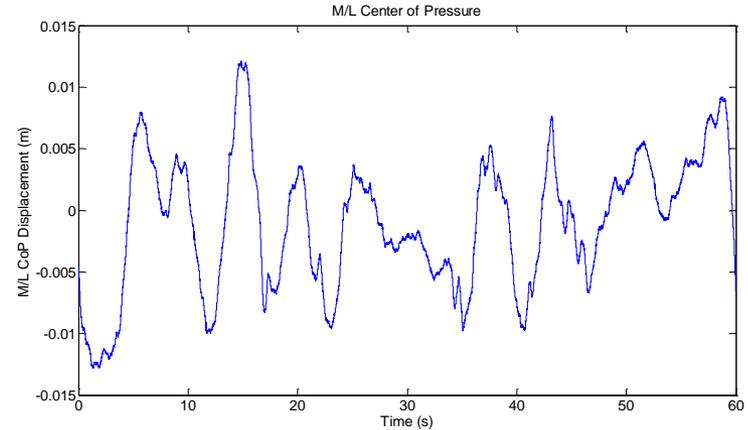
The UD Engineering Wellness and Safety Lab focuses on balance as a fall risk-factor.

Table 1. Results of Univariate Analysis* of Most Common Risk Factors for Falls Identified in 16 Studies* That Examined Risk Factors

Risk Factor	Significant/Total†	Mean RR-OR‡	Range
Muscle weakness	10/11	4.4	1.5–10.3
History of falls	12/13	3.0	1.7–7.0
Gait deficit	10/12	2.9	1.3–5.6
Balance deficit	8/11	2.9	1.6–5.4
Use assistive device	8/8	2.6	1.2–4.6
Visual deficit	6/12	2.5	1.6–3.5
Arthritis	3/7	2.4	1.9–2.9
Impaired ADL	8/9	2.3	1.5–3.1
Depression	3/6	2.2	1.7–2.5
Cognitive impairment	4/11	1.8	1.0–2.3
Age >80 years	5/8	1.7	1.1–2.5

Individuals with balance impairment are 1.6 – 5.4 times more likely to fall.

Using engineering tools, we can measure balance deficits and improvements.



Increased amount of sway or speed of sway is often the sign of balance deficit/increased fall risk.

Through this type of research we were able to develop a method for clinical screening fall risk.

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Development of a Protocol for Improving the Clinical Utility of Posturography as a Fall-Risk Screening Tool

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Background. The usefulness of posturography in the clinical screening of older adults for fall risk has been limited by a lack of standardization in testing methodology and data reporting. This study determines which testing condition and postural sway measures best differentiate recurrent fallers and nonrecurrent fallers.

Methods. One hundred and fifty older adults were categorized based on their fall status in the past year. Participants performed four quiet-standing tasks, eyes open and eyes closed in both comfortable and narrow stance, for 60 seconds while standing on a force-measuring platform. Traditional and fractal measures were calculated from the center of pressure data. Logistic regression was performed to determine the model for each condition that best discriminated between recurrent fallers and nonrecurrent fallers.

Results. The eyes closed comfortable stance condition, with its associated model, best differentiated recurrent fallers and nonrecurrent fallers. Medial–lateral sway velocity, anterior–posterior short-term α -scaling exponent, medial–lateral short-term α -scaling exponent, mean frequency, body mass index, and age were included in this model. Sensitivity of the model was 75%, and specificity was 94%.

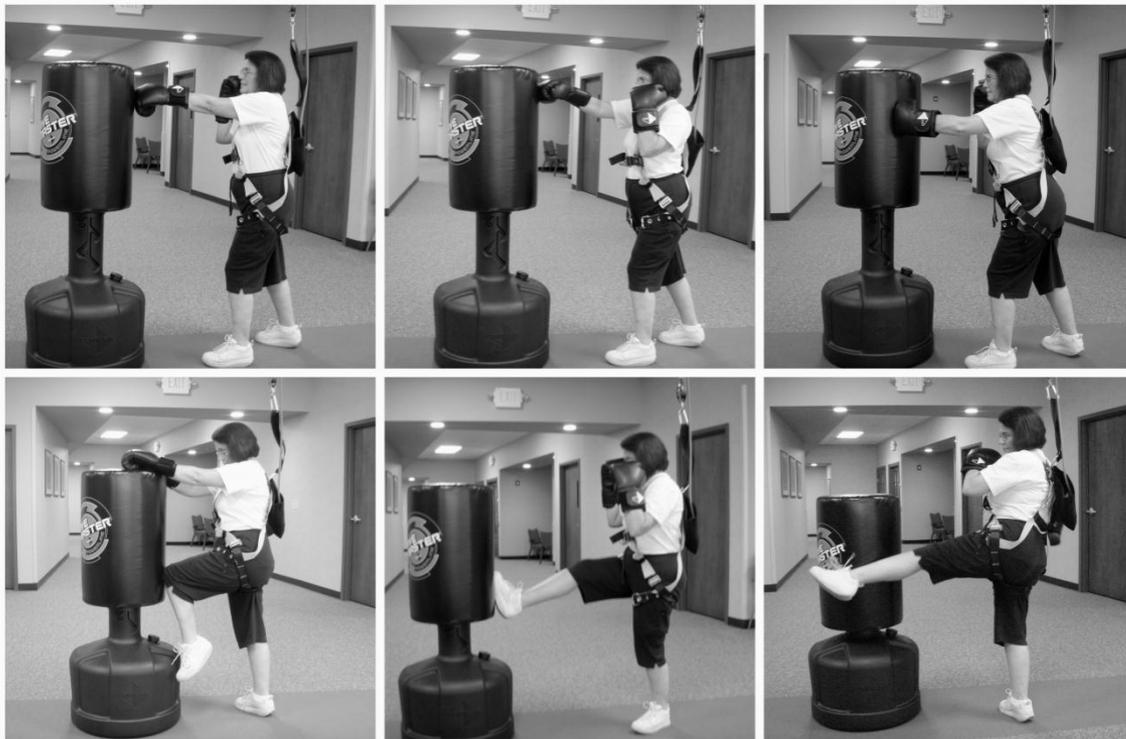
Conclusions. This resulting model demonstrates potential to differentiate recurrent fallers and nonrecurrent fallers in an eyes closed comfortable stance condition. The inclusion of traditional sway parameters, fractal measures, and personal characteristics in this model demonstrates the importance of considering multiple descriptions of postural stability together rather than using only a single measure to establish fall risk.



We also examined the effect of carrying grocery bags on postural stability.

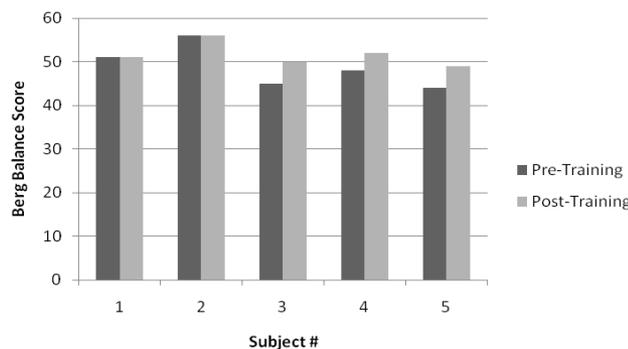
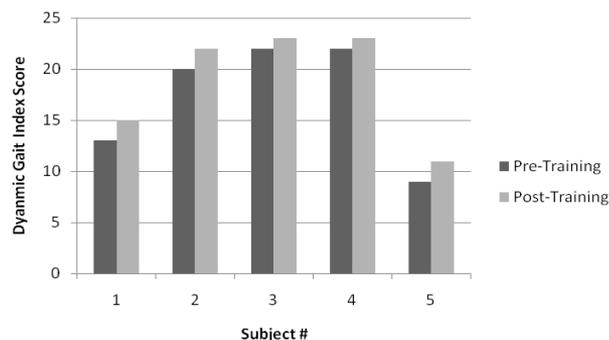


We also focus on improving balance in neurological populations at high risk of falls – Kickboxing & MS



Pre – and Post – Program Measures:

- Timed Up & Go (TUG)
- Berg Balance Scale (BBS)
- Dynamic Gait Index (DGI)
- Ten Meter Walk Test
- Activities of Balance Confidence Scale(ABC)
- Posturography – A/P and M/L COP Sway Range
- mCTSIB (30 seconds each trial)
- Limits of Stability (2 trials)



We're also looking at monitoring physical movement in the real world



We look forward to connecting with you!

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Keeping Balanced in Dayton

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 University of Dayton Engineering Wellness & Safety Lab

Balance Class at St. Leonard's Community

As part of Falls Prevention Awareness set up around the room, all with information about a different aspect of fall prevention: balance research, home safety, and stability exercises. At the balance research table, you'll get the chance to try out our balance plate (see article on page 2) and learn about how we conduct research that contributes to fall prevention. At the home safety station, we'll show you how to make a few

Special Points of Interest:

- National Falls Prevention Awareness Day
- High-tech tool to measure balance
- Inexpensive products can make your home safer

You're Invited to the UD Balance Class!
 Friday, September 23
 3:00pm - 5:00pm
 St. Leonard
 8100 Cloy Rd.
 Centerville, OH 45458

