Effect of Compliant Flooring on Postural Stability in an Older Adult Population

Renee L. Beach
University of Dayton, stander@udayton.edu

Follow this and additional works at: http://ecommons.udayton.edu/stander_posters

Recommended Citation
http://ecommons.udayton.edu/stander_posters/217
Effect of Compliant Flooring on Postural Stability in an Older Adult Population

Renee Beach
Advisor: Kimberly Bigelow, PhD, Kurt Jackson, PhD
Department of Mechanical Engineering

MOTIVATION
- One out of three adults age 65+ fall each year [1]
- 1800 deaths from falls annually [2]
- Hip fracture most serious consequence of falling [3]
- Compliant flooring reduces femoral impact by up to 50% [4]
- Two commercially-made compliant floors have been identified as a passive intervention approach that may protect against fall-related injuries [4]

OBJECTIVE
Evaluate whether compliant floors have a positive or negative effect on postural stability.

HYPOTHESIS
Compliant flooring will display a significant increase (p<0.05) in postural stability as compared to traditional flooring.

METHODS

Subjects
20 healthy older adults, 6 male, 4 female, mean age 72.6 ± 7.6 years

Testing Protocol
Two 30 second trials were conducted barefoot on a balance plate while wearing a full body harness:
- Flat Plate (Eyes open and closed)
- SmartCell (Eyes open and closed)
- SofTile (Eyes open and closed)
- Limits of Stability (LOS)

RESULTS
- Flooring type proves to be significant (*), on the A/P sway range

<table>
<thead>
<tr>
<th>Floors</th>
<th>A/P Sway</th>
<th>M/L Sway</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flat-Smart</td>
<td>0.044*</td>
<td>0.947</td>
</tr>
<tr>
<td>Flat-Soft</td>
<td>0.012*</td>
<td>0.940</td>
</tr>
<tr>
<td>Smart-Soft</td>
<td>0.582</td>
<td>0.994</td>
</tr>
</tbody>
</table>

CONCLUSIONS AND NEXT STEPS
- Compliant flooring may influence postural stability during quiet standing in the A/P direction
- The clinical and practical significance is yet to be determined
- Future work is now underway to examine effects of compliant flooring on stability during movements that older adults and perform daily

REFERENCES
2. Centers for Disease Control and Prevention. 16 Sept 2011; 20 Jan 2012