



<b>Title</b>	Investigating normal day to day variations in postural control in a healthy young population (age 18-40) using wii balance boards
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<b>Publication date</b>	2015-10
<b>Publication information</b>	Johnston, William, Ciaran Purcell, C. Duffy, T. Casey, Barry R. Greene, D. Singleton, and Brian Caulfield. "Investigating Normal Day to Day Variations in Postural Control in a Healthy Young Population (Age 18-40) Using Wii Balance Boards." BMJ Publishing Group, October 2015. <a href="https://doi.org/10.1136/bjsports-2015-095573.54">https://doi.org/10.1136/bjsports-2015-095573.54</a> .
<b>Conference details</b>	6th International Ankle Symposium, Dublin, Ireland, 16-18 October 2015
<b>Publisher</b>	BMJ Publishing Group
<b>Item record/more information</b>	<a href="http://hdl.handle.net/10197/7941">http://hdl.handle.net/10197/7941</a>
<b>Publisher's version (DOI)</b>	<a href="https://doi.org/10.1136/bjsports-2015-095573.54">10.1136/bjsports-2015-095573.54</a>

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**Title:** Investigating normal day-to-day variations in postural control in a healthy young population using Wii balance boards

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**Background:** Objective measurements of postural control are frequently used to examine the causes of, features associated with, and therapeutic interventions for ankle instability. However, researchers have typically used single-session measures to represent postural control at one point in time. Recent studies in a healthy elderly population demonstrate significant variations in day-to-day postural control and suggest that single-session measurement may not truly reflect postural control capabilities. An investigation into patterns of day-to-day variation in postural control in a younger population are warranted.

**Objective:** To investigate the variations between continuous day-to-day clinical measurements of postural control, and the associations between these continuous daily measurements and once-off measurements.

**Design:** Observational study.

**Setting:** University laboratory.

**Participants:** Twenty-four healthy young adults (9 female, 15 male) aged 18-40 years.

**Interventions:** Subjects complete two 40 second eyes open and eyes closed static balance trials on Wii Balance Boards.

**Main Outcome Measurements:** Lifestyle questionnaire and 40 second eyes-open/eyes-closed static Wii Balance Board balance tests, on 20 consecutive weekdays.

**Results:** Coefficient of variation demonstrated substantial inter-subject differences from 10-131% (eyes-open) and 10-112% (eyes-closed) across variables. Minimal detectable change percentage showed that 22/30 parameters demonstrated acceptable measurement error (<30%). Across mean COP distance, mean sway length, mean sway frequency and sway area, 16/24 (eyes-open) and 11/24 participants (eyes-closed) exhibited statistically significant differences ( $p < 0.05$ ) between the once-off and the daily measures.

**Conclusion:** Variations in postural control exist in a healthy young population. Depending on testing conditions and specific variables, a once-off measure is not indicative of an individual's true postural control. Therefore, when investigating subtle changes in postural control, long-term monitoring may prove to be a superior assessment tool.