

## Abstract (english)

### Title:

Intra-rater reliability, agreement and validity of a dynamic balance test performed on a force platform by elderly above 65 years of age.

### Project period:

01.03-2012 – 02.07-2012

### Project group:

12gr1092

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**Subject heading:** *postural control, balance, elderly, force platform, retest reliability, construct validity and dynamic stability*

### Synopsis:

The purpose of this thesis was to perform a intra-rater and intra-day examination of reliability, agreement and validity for a dynamic balance test performed on a force platform by elderly persons above 65 years of age.

The examination was made with a view, to introduce the dynamic balance test of the force platform as part of the hospitals' fall examination of the patients above 65 years with an increased risk of falling. This test is a measurement of the dynamic stability, which is not included in the fall examination, even though it is an aspect of postural control.

This has led to the following problem formulation:

*Is the force platform's dynamic balance test a valid and reliable measurement for estimating balance, which can be used in connection with fall examination of patients?*

A test-retest examination of the balance test was made, by which the participants' average score from 6 repetitions in both the test and retest were used as the outcome variable. Construct validity was applied, because the test was compared with the Timed Up and Go test (TUG) and the static balance test of the force platform, as it was estimated that these represent part elements of the force platform's dynamic balance test. Apart from construct validity the face validity of the test was also evaluated.

The results of the reliability test show that the balance test is a reliable measurement (ICC =0.964). However no acceptable coherence was found between this test and the TUG test ( $r_s = -0,295$ ) or the static test ( $r_s = 0.591$ ) although the test was estimated as being a good indicator for dynamic stability, because it evaluates the capability of moving the Center of Pressure (COP) in a controlled movement within the Base of Support (BOS).

Based on these results it was not possible to conclude, that the dynamic balance test of the force platform is a valid measurement. If the test is to be introduced as part of the fall examination, it is advisable that a further examination of the construct validity of the test is made. In a potential coming examination the test can be compared to other related balance tests like for instance Bergs Balance Scale (BBS).

## Abstract (dansk)

### Titel:

Intra-rater reliabilitet, overensstemmelse og validitet af en dynamisk balancetest udført på kraftplatform af ældre over 65 år.

### Projektperiode:

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### Projektgruppe:

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Indholdet af denne rapport er offentligt tilgængelig, men udgivelse (med kilder) må kun ske med forfatterens accept.

**Emneord:** *postural kontrol, balance, ældre, kraftplatform, retest reliability, construct validity og dynamisk stabilitet.*

### Synopsis:

Formålet med dette specialeprojekt var at foretage en intra-rater og intra-day undersøgelse af reliabilitet, overensstemmelse og validitet for en dynamisk balancetest udført på kraftplatform af ældre personer >65 år.

Undersøgelserne blev foretaget med henblik på at indføre kraftplatformens dynamiske balancetest, som en del af sygehusenes udredning af faldpatienter >65 år med forøget risiko for fald. Denne test måler den dynamiske stabilitet, hvilket der ikke foretages nogen undersøgelse for i den nuværende faldudredning, selvom dette er et aspekt af den posturale kontrol.

Dette har ført frem til følgende problemformulering:

*Er kraftplatformens dynamiske balancetest en valid og reliabel målemetode til vurdering af balance, som kan bruges i forbindelse med udredningen af faldpatienter?*

Der blev foretaget en test-retest undersøgelse af balancetesten, hvor deltagernes gennemsnitlige score ud af 6 gentagelser ved test 1 og 2 blev brugt som outcome variabel. Der blev anvendt *construct validity*, fordi testen blev sammenlignet med Timed Up and Go testen (TUG) og kraftplatformens statiske balancetest. Disse balancetests blev valgt, fordi det blev vurderet, at de repræsenterer delelementer af kraftplatformens dynamiske balancetest.

Udover *construct validity* blev også testens face validity vurderet.

Resultaterne af reliabilitetsundersøgelsen viste at testen er en reliabel målemetode ( $ICC=0,964$ ). Der blev dog ikke fundet acceptabel sammenhæng mellem denne test og TUG testen ( $r_s=-0,295$ ) eller den statiske test ( $r_s=0,591$ ), selvom den ellers blev vurderet til at være en god indikator for dynamisk stabilitet, fordi den evaluerer evnen til at bevæge trykpunktscenteret (Center of Pressure (COP)) i en kontrolleret bevægelse indenfor understøttelsesfladen (Base of Support (BOS)).

På baggrund af disse resultater, kunne derfor ikke konkluderes, at kraftplatformens dynamiske balancetest er en valid målemetode. Hvis testen skal indføres i faldudredningen, rådes det derfor til, at der foretages en yderligere undersøgelse af testens *construct validity*. I en eventuel kommende undersøgelse, kan testen sammenlignes med andre relaterede balancetests som f.eks. Bergs Balance Skala (BBS).