

DIRECTION TRANSLATION PROTOCOL (DTP) FOR OBJECTIVE EVALUATION OF MOVEMENT EFFICIENCY DURING GAIT

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Introduction

Gait analysis provides comprehensive documentation on the biomechanical issues of a patient during level walking. There are though other parameters of movement, like maintaining direction & turning, as well as the ability to maintain pace that are not addressed by gait analysis. Various simple tests exist for assessing individual parameters [Wolf et al, 1999, Roush et al, 2006]. The purpose was to create a simple protocol that can be performed in the gait lab, from subjects with different abilities to assess parameters like: direction maintenance, turning efficiency as well as the ability to maintain pace during gait.

Methods



Figure 1: Direction Translation Protocol laboratory set-up.

Gait lab 3D motion analysis system is used to record the trajectories of two markers placed on the subject's shoulders (acromion). A 2.5 m distance area is defined in the center of the gait lab walkway using cones. The subject is then asked to walk for 5 full rounds around the cones clockwise (Total Distance = 25m) and another 5 full rounds anti-clockwise. A virtual marker which is located in the middle of the distance of the 2 shoulder markers is used to calculate all the parameters for the analysis from the X,Y,Z trajectories of the virtual marker. Data from 1 Male & 1 Female adult normal subjects are presented measured in two different moments of the day for two different days a week apart. Descriptive statistics and Coefficients of Variation (CV) are presented for the parameters measured for the Male (M) and the Female (F).

Results

Mean Total XY trajectory length: M=28.8 m (CV = 4%) & F =29.15 ± 1.05 m. Mean Total Time: M = 31.12 ± 1.6 sec (CV = 5%) & F = 31.69 ± 1.21 sec (CV = 4%). Mean 0.5 m Turning Division Time: M = 1.20 ± 0.01 sec (CV = 1%) & F = 1.31 ± 0.02 sec (CV = 2%).

Discussion

The repeatability data of the test for normal subjects show a satisfactory Coefficient of Variance values for the assessment parameters. The new gait lab tool for movement efficiency can be used for the follow up of various pathologies especially for comparisons before and after treatments.

References

Wolf SL *et al*, Physical Therapy 79(12), 1999
Roush *et al*, The Internet Journal of Allied Health Sciences and Practice, 4 (3),2006