CHANGES IN TEMPOROSPATIAL GAIT PARAMETERS AT DIFFERENT FREELY SELECTED WALKING SPEEDS

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INTRODUCTION

Walking at varied cadence requires a change in gait parameters to allow balance and control of the human body. Adjusting stride width, step length, and cadence is associated with ambulating at different speeds (Helbostad, 2003). The intention of this study was to assess changes in step length, stride width and cadence at varied cadence.

METHOD

When providing your methods, you should use the standard presentation adopted in scientific papers.

Subjects: Eleven able bodied individuals between the ages of 20 and 30 with no known pathologies

Apparatus: Protokinetics Zeno Walkway with PKMAS software

Procedures: Subjects were instructed to walk at 3 self selected speeds. The initial visit involved walking over the walkway at a 'normal' pace that was comfortable. The following visit involved walking at a 'slow' and 'fast' pace. Each condition consisted of walking 12 feet over the mat, turn around and walk back. A total of 6 passes were recorded under each condition.

Data Analysis: PKMAS software processes foot placement data from a Protokinetics Zeno Walkway. Averages of kinematic data, specifically step length, stride width, and cadence, were recorded. A total of six paired T-tests were conducted between 'slow to normal' and 'normal to fast' conditions.

RESULTS

Average step length and cadence increase as walking speed increases from 'slow to normal' as well as from 'normal to fast.' Changes in stride width were not significant.

	Stride Width (cm)	Step Length (cm)	Cadence (steps/min)
Slow	8.31 (+- 3.46)	54.9 (+- 4.02)	82.82 (+- 10.70)
Normal	8.56 (+- 3.60)	71.8 (+- 4.10)	108.37 (+- 5.88)
Fast	9.06 (+- 3.25)	82.1 (+- 6.94)	128.96 (+- 19.9)

Figure 1. Averages of stride width, step length, and cadence at each freely-selected walking speed.

DISCUSSION

Kinematic variables can be used to better understand human locomotion. These principles can then be used to improve pathologic gait and assist in a clinical setting particularly prosthetic care. Further research can be conducted to truly understand gait changes and how to then better accommodate through the use of prosthetic componentry.

CONCLUSION

Temporospatial gait parameters change as an individual increases their walking speed.

CLINICAL APPLICATIONS

Enhancement of Orthotic and Prosthetic care can be achieved through better understanding of changes in temporospatial gait parameters.

REFERENCES

Helbostad, J. L., Moe-Nilssen, R., (2003). The effect of gait speed on lateral balance control during walking in healthy elderly. Gait and Posture, 18, 27-36.