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Functionality Variables and Accelerometry Energy Expenditure Estimate Improvement in Individuals with Locomotor Dysfunction

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ABSTRACT

• age, sex, weight, and height
• Current Actical algorithms underpredict EE estimates in individuals with abnormal gait

Table 3: Regressions A–E

| Variable | Age | Gender | Height | Weight | 30CS | 6MWT | 10mW-p | 10mW-f | 10mW-dif | 6MWT-p | 6MWT-f | 6MWT-dif | 30CS-p | 30CS-f | 30CS-dif | 6MWT-p | 6MWT-f | 6MWT-dif | 30CS-p | 30CS-f | 30CS-dif | 6MWT-p | 6MWT-f | 6MWT-dif | 30CS-p | 30CS-f | 30CS-dif |
|----------|-----|--------|--------|--------|------|------|-------|-------|---------|--------|--------|---------|-------|-------|---------|-------|-------|---------|-------|-------|---------|-------|-------|---------|-------|-------|---------|-------|-------|---------|
| A        |     |        |        |        |      |      |       |       |         |        |        |         |       |       |         |       |       |         |       |       |         |       |       |         |       |       |         |       |       |         |
| B        |     |        |        |        |      |      |       |       |         |        |        |         |       |       |         |       |       |         |       |       |         |       |       |         |       |       |         |       |       |         |
| C        |     |        |        |        |      |      |       |       |         |        |        |         |       |       |         |       |       |         |       |       |         |       |       |         |       |       |         |       |       |         |
| D        |     |        |        |        |      |      |       |       |         |        |        |         |       |       |         |       |       |         |       |       |         |       |       |         |       |       |         |       |       |         |
| E        |     |        |        |        |      |      |       |       |         |        |        |         |       |       |         |       |       |         |       |       |         |       |       |         |       |       |         |       |       |         |

Fig. 1: The Gait Cycle

Fig. 5: 4SB (4 Stage Balance Test)

Fig. 6: TUG (Timed Up-and-Go)

Fig. 7: 10mW (10 Meter Walk)

METHODS

• Two cohorts of ambulatory subjects with diverse degrees of gait impairment - ranging from mild to severe, requiring use of assistive devices and rehabilitation interventions

CONCLUSIONS

• Actual® accelerometers underpredict energy expenditure estimates when used by individuals with locomotor dysfunction (abnormal gait)
• Regression equations with variables of the 5 functional tests (30CS, 6MWT, 10mW, and 6MWT) - as well as with the conventional age, sex, weight, and height – produce improved energy expenditure estimates for gait impaired individuals in comparison to Actual® estimates - these standard and simple tests are fitting variables to be incorporated into Actual® calculations for those with abnormal gait - future studies with much larger sample sizes would be desired to improve R² values