

# Measuring Daily Activity of Children with Cerebral Palsy Using Accelerometry

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## BACKGROUND:

The study of exercise training in adolescents with cerebral palsy (CP) has undergone significant development since 2006. Of special interest is the translation of a rehabilitation exercise program into daily activity and participation in an adolescent with CP. This poster details current research addressing the measurement of daily activity of adolescents with CP.

### Introduction:

- There is a need to measure daily physical activity in the natural environment of adolescents with CP.
- This study addresses the feasibility and interpretation of the use of the Actigraph® accelerometer in adolescents with CP.



### Participants

- 23 adolescents (17M, 6F, mean age: 13.5 years) have been analyzed.
- GMFCS Levels I (n=9), II (n=5), III (n=5), IV (n=4) with a diagnosis of CP

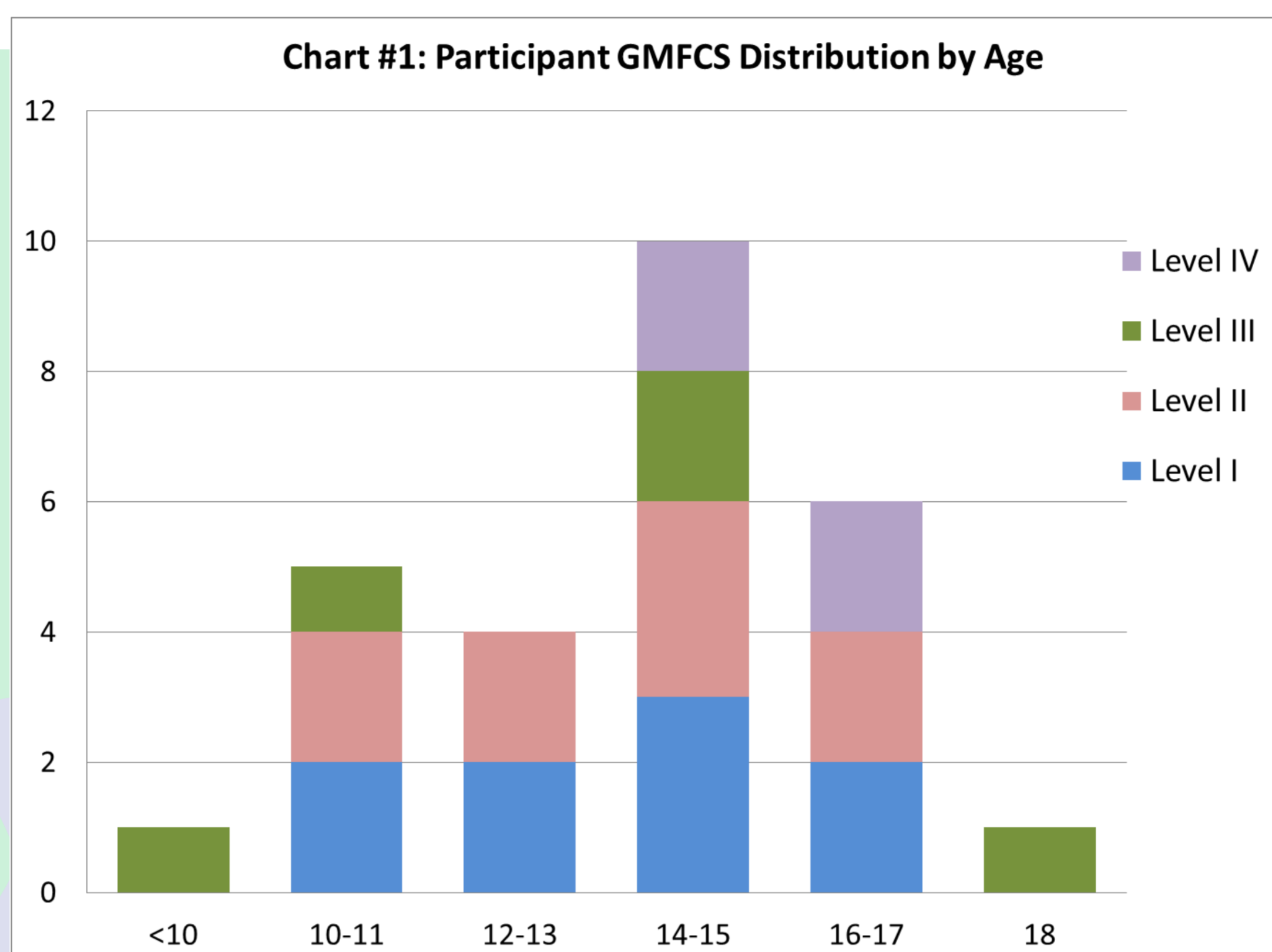


### Methods

- The accelerometer worn for 7 days (range: 5-7 days)
- Wrist and waist accelerometry data were collected and correlated to a daily log kept by the adolescents.

### Analysis

- Data analyzed by one investigator (SN) following the guidelines for general accelerometer use.
- Activity intensity was examined using the cut-points developed by Evenson, *et al.* (2008) which were recently validated for use in children and adolescents with CP by Clanchy, *et al.* (2011).



Event	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Time the device was put on	8:30AM	8:30AM	9:30 AM	9:15AM	9:30AM	8:30AM	10:15AM
Times the device may have been taken off and put back on and reason(s) (e.g. nap, swimming, shower, etc)	2-6pm	12-1pm	10:30 - 12:30 NAP	2pm-4pm for swim	4-5:30 pm for swim	3pm-5pm for swim	3:00-5pm swim
Time the device was taken off before bed	7:20 pm	10 pm	6:00 pm	8:15 pm	9:15 pm	8:45 pm	9:05 pm

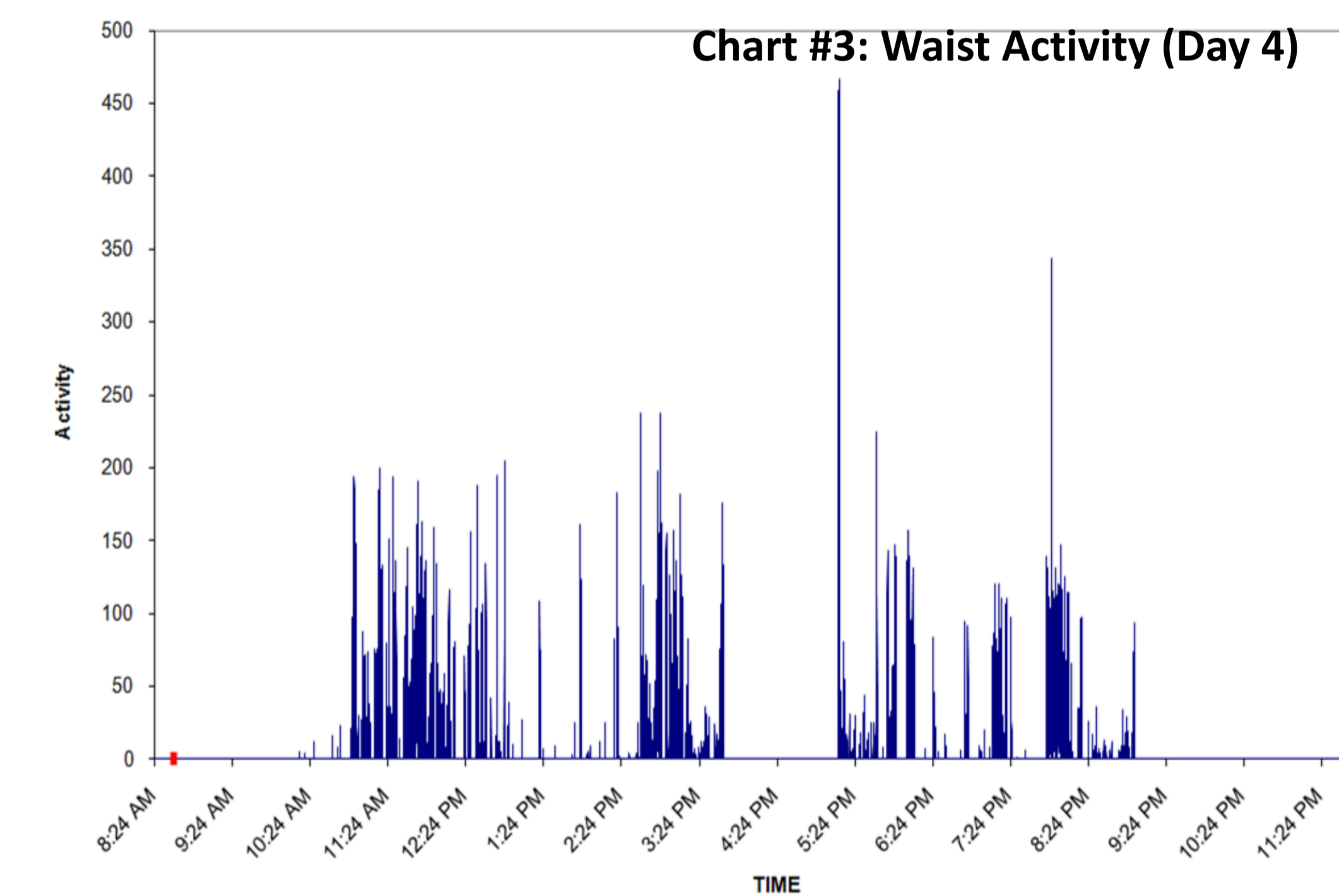
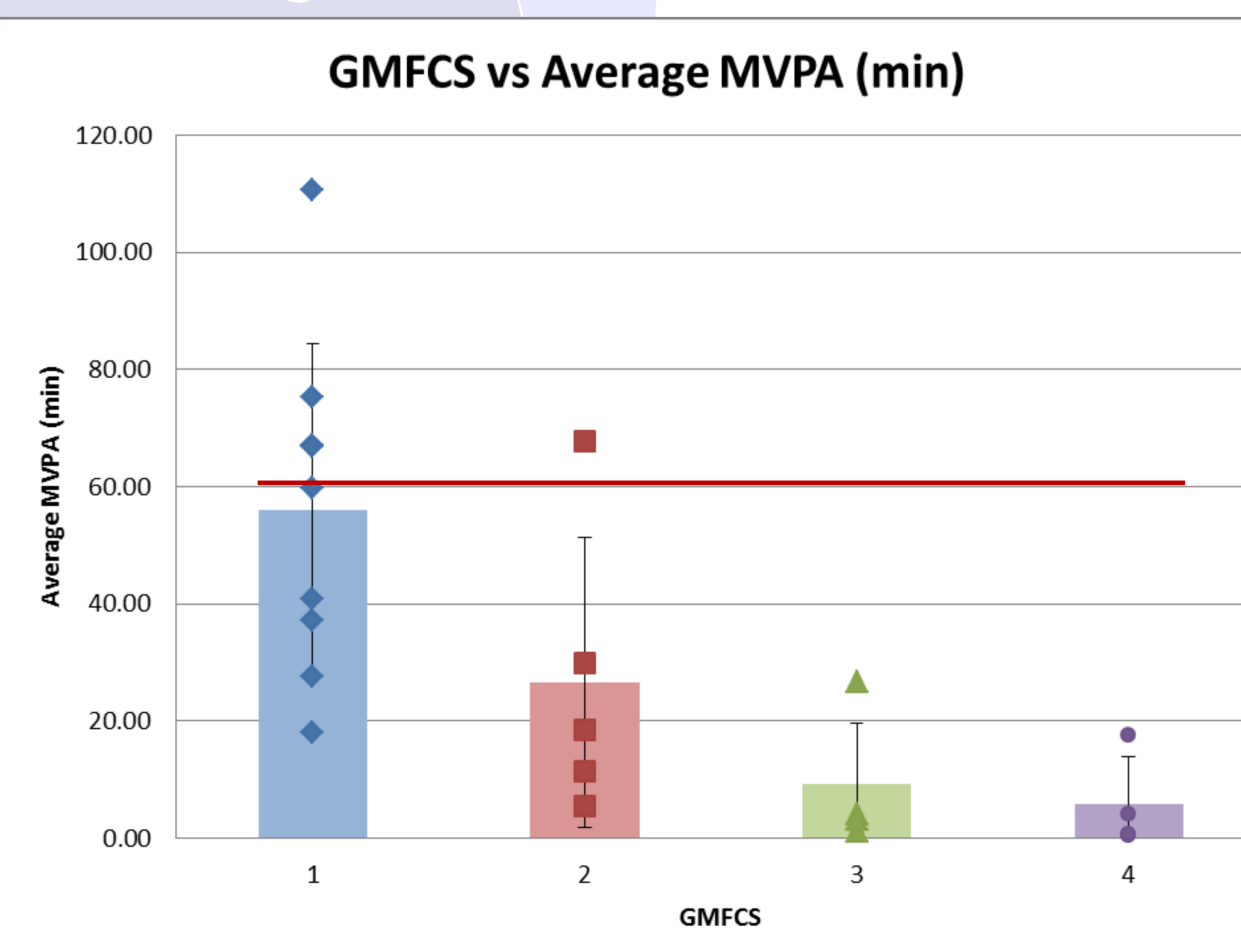


Table #1: Mean Activity Levels by GMFCS

		GMFCS				
		Level I	Level II	Level III	Level IV	Total
		(n = 9)	(n = 5)	(n = 5)	(n = 4)	(n = 23)
LPA	min/day	121.5 (38.7)	95.7 (43.7)	66.7 (33.5)	32.1 (18.2)*	88.4 (47.8)
	min/hr	10.2 (3.4)	8.2 (3.6)	5.6 (2.3)	1.6 (1.2)*†	7.3 (4.2)
MPA	min/day	33.0 (15.6)	16.4 (12.5)	6.0 (5.7)*	2.7 (3.7)*	18.2 (17.1)
	min/hr	2.7 (1.2)	1.4 (1.0)	0.5 (0.4)*	0.2 (0.3)*	1.5 (1.4)
MVPA	min/day	56.0 (28.4)	26.6 (24.7)	9.3 (10.4)*	5.8 (8.0)*	30.7 (30.3)
	min/hr	4.5 (2.1)	2.2 (2.1)	1.5 (1.5)*	0.5 (0.7)*	2.6 (2.4)

Data are presented as mean (SD). \* indicates significant difference from Level I, † indicates significant difference from Level II, p < 0.05.

## Results

- Waist activity is much lower than provincial health guidelines (60 minutes MVPA).
- Wrist accelerometry interesting comparison, but not yet validated.
- Participants showed a high acceptance rate of accelerometers; only concerns expressed regarding the visibility of the device.
- Log sheets show consistent attention to detail.

## CONCLUSION

- The Actigraph Accelerometer shows promise as a feasible and valid measurement of performance in daily activity of adolescents with CP.
- Preliminary analysis shows a significant depression in activity levels in adolescents with CP.
- The Stay-FIT pilot study is an important first step to developing an effective intervention study focusing on the translation of an exercise training program into the daily activity/ participation of children and adolescents with CP.

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