VO2 estimate from GoX Studio vs. Cosmed, April 2016

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Objective: The purpose of this study was to modify the PKSE to include running.

Methods: Four subjects (3 female, 1 male) participated in this test. The subjects walked at a constant 1.112 m/s pace on a level treadmill for 5 minutes, then increased their pace to 1.56 m/s for 3 minutes, then increased their pace to 2.24 m/s for 3 minutes, then increased their pace to 2.68 m/s for 3 minutes, then a 5 minute cool down at 1.112 m/s. The heart rate, respiration rate, and VO2 were measured using Cosmed. We normalized the energy expenditure by the body mass. VO2 was converted to watts and normalized by body mass.

Results and Discussion:

This particular iteration is quite strong (R^2 = 0.95). We tested the model using data from the pilot study. The results are tabulated in table 1. In general, the model tends to underpredict, but the data are generally within 8 percent.

Table 1: PKSE predictions for metabolic cost for subjects

Subject	Gender	Measured VO2, ml/min/kg	Predicted VO2, ml/min/kg	% Error
1	Female	11.8	10.3	-13.0%
1	Female	14.4	11.7	-18.3%
1	Female	26.7	28.1	5.1%
1	Female	34.6	35.0	1.0%
2	Male	14.4	14.5	0.7%
2	Male	19.5	20.7	6.0%
2	Male	34.8	31.8	-8.7%
2	Male	36.4	37.0	1.4%
3	Female	11.1	12.8	15.5%
3	Female	15.1	17.7	17.3%
3	Female	29.1	27.8	-4.4%
3	Female	34.3	32.8	-4.4%
3	Female	14.8	15.0	1.2%
4	Female	10.2	9.3	-9.7%
4	Female	16.0	16.3	2.0%
4	Female	25.0	27.0	8.1%
4	Female	30.1	33.0	9.6%
4	Female	14.7	13.2	-10.4%