Reviewer ID: Carlos L. Cano, Elsa Sun

Last updated: May 7th, 2024

Research Summary – Wingate Anaerobic Test (WAnT) – Other

Author Year Country Research Design Setting	Demographics and Injury Characteristics of Sample	Validity	Reliability	Responsiveness Interpretability
Nash et al. (2007) Repeated Testing Academic medical centre.	7 participants with motor-complete (AIS A or B) paraplegia Age range: 39-58 yrs old DOI: 13.1±6.6 yrs T5-T12 injuries Study participants recruited from a pool of volunteers who reported mild to moderate upper limb pain during the performance of daily activities and used a manual wheelchair for locomotion. All participants had been physically inactive for at least 6 months before entry into the study.			**Interpretability:** Subjects underwent circuit resistance training (CRT) 3 times weekly on nonconsecutive days for 16 weeks. Each session lasted approximately 40-45 minutes and included resistance training and high-speed, low-intensity endurance activities (arm cranking) with interposed periods of incomplete recovery (heart rate not falling to baseline). Effects of CRT on anaerobic power: (values are mean (SD)) See table 1 below.

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<tr><td></td><td></td><td></td><td></td><td>After 12 weeks of training, both study groups (ET and RT) displayed significant increases in Ppeak and Pmean (P<0.05). Mean power increased 8% and 5% for the RT and ET groups, respectively, with no statistically significant differences apparent between groups. Whereas RT and ET both produced significant enhancement of Ppeak (P<0.05), the RT produced significantly greater gains (15.6%) compared with ET (2.6%).</td></tr>
<tr><td></td><td colspan="4">Table 1
<table><tr><th>Variables:</th><th>Pretraining</th><th>Post-training</th><th>Change (%)</th><th>P</th></tr><tr><td>Peak power (W)</td><td>380.0 (62.2)</td><td>402.6 (78.6)</td><td>6.0</td><td>.005</td></tr><tr><td>Mean power (W)</td><td>256.4 (46.0)</td><td>278.4 (53.5)</td><td>8.6</td><td>.001</td></tr></table></td></tr>
</table>

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Author Year Country Research Design Setting	**Demographics and Injury Characteristics of Sample**	**Validity**	**Reliability**	**Responsiveness Interpretability**
Jacobs et al. (2005) Test-retest	N=45 participants with motor-complete injuries (AIS A/B) C5 group: N=15 Mean (SD) age: 34.7 (11.7) years Mean (SD) body mass: 75.6 (19.6) kg Mean (SD) DOI: 8.2 (3.9) years C6 group: N=15 Mean (SD) age: 31.8 (7.6) years Mean (SD) body mass: 71.3 (16.3) kg Mean (SD) DOI: 10.0 (7.2) years C7 group: N=15 Mean (SD) age: 35.1 (16.4) years Mean (SD) body mass: 72.8 (15.2) kg		**Test-retest, Inter-rater, Intra-rater** No significant differences were found between trials in either P_{peak} or P_{mean}. Values of P_{peak} were significantly (P<.05) associated between trials for the C5 (r^2 =.95), C6 (r^2=.98) and C7 (r^2=.93) groups. Values of P_{mean} were also significantly (P<.05) associated between trials for the C5 (r^2 =.98), C6 (r^2=.96) and C7 (r^2=.88) groups.	**Interpretability:** Mean (SD) power output values shown below for each trial for each group: see table 2 below.

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<tr><td></td><td>Mean (SD) DOI: 10.6 (7.4) years

Injury level: C5 – C7</td><td></td><td></td><td></td></tr>
<tr><td></td><td colspan="4">Table 2
<table>
<tr><th></th><th colspan="2">C5 group</th><th colspan="2">C6 group</th><th colspan="2">C7 group</th></tr>
<tr><th></th><th>Trial 1</th><th>Trial 2</th><th>Trial 1</th><th>Trial 2</th><th>Trial 1</th><th>Trial 2</th></tr>
<tr><td>P_{peak} (W)</td><td>53.9 (34.4)</td><td>57.0 (37.7)</td><td>121.7 (57.3)</td><td>119.7 (52.2)</td><td>203.4 (64.4)</td><td>206.8 (58.1)</td></tr>
<tr><td>P_{mean} (W)</td><td>31.7 (26.4)</td><td>31.9 (26.4)</td><td>70.3 (26.3)</td><td>72.3 (24.1)</td><td>134.2 (38.8)</td><td>138.2 (33.1)</td></tr>
</table></td></tr>
<tr><td>Jacobs et al. (2004)

Convenience sample</td><td>N=39
33M, 6F

C5 group: N=13 (10M, 3F)
Mean (SD) age: 31.0 (11.7) years
Mean (SD) body mass: 77.5 (18.3) kg

C6 group: N=13 (11M, 2F)
Mean (SD) age: 35.2 (9.2) years</td><td></td><td></td><td>Interpretability:
Mean (SD) peak power (P_{peak}) and mean power (P_{mean}) is shown in the table below for the C5, C6, and C7 group: see table 3 below.</td></tr>
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<tr><td></td><td>Mean (SD) body mass: 75.6 (17.9) kg

C7 group: N=13 (12M, 1F)
Mean (SD) age: 41.3 (16.1) years
Mean (SD) body mass: 73.6 (13.3) kg

3 groups w/ neurologically complete cervical level SCI (C5, C6 and C7)</td><td></td><td></td><td></td></tr>
<tr><td></td><td colspan="4">Table 3
<table><tr><th>Power output (W)</th><th>C5</th><th>C6</th><th>C7</th></tr><tr><td>P_{peak}</td><td>83.2 (47.2)</td><td>171.3 (47.5)</td><td>224.5 (56.8)</td></tr><tr><td>P_{mean}</td><td>27.5 (21.4)</td><td>66.4 (24.0)</td><td>133.1 (47.9)</td></tr></table></td></tr>
<tr><td>Jacobs et al. (2003)

Test-retest</td><td>N=43 paraplegic participants
33M, 10F
Mean (SD) age: 34.4 (10.3) years</td><td></td><td>Test-retest, Inter-rater, Intra-rater
No significant differences were found between 2 test trials for any of the 4</td><td>Interpretability:
Mean (SD) power output values shown below for each trial: see table 4 below.</td></tr>
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<tr><td></td><td>Mean (SD) body mass: 74.2 (18.3) kg
Mean (SD) DOI: 8.1 (7.1) years

Injury levels T2-T12</td><td></td><td>power output variables:
P_{peak} = highest average power output over any given 5-second period
P_{mean} = average power output over a 30-second trial
P_{min} = lowest power output recorded
Fatigue (% decrease) = percentage decline in power output relative to P_{peak}

Values of P_{peak} and P_{mean} were significantly associated between trials, with calculated r^2 values of 0.92 and 0.94 respectively.</td><td></td></tr>
<tr><td></td><td colspan="3">Table 4
<table><tr><th></th><th>Trial 1</th><th>Trial 2</th></tr><tr><td>P_{peak} (W)</td><td>312.3 (97.1)</td><td>311.4 (94.6)</td></tr><tr><td>P_{mean} (W)</td><td>221.1 (71.7)</td><td>221.7 (70.0)</td></tr></table></td><td></td></tr>
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	P_{min} (W)	140.6 (49.5)	141.9 (50.6)	
	Fatigue (% decrease)	58.6 (12.1)	57.4 (13.5)	