

*Example*

**MECHANICAL EFFICIENCY OF ASYNCHRONOUS HAND-RIM WHEELCHAIR PROPULSION AFTER 4-WEEKS OF PRACTICE**

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**PURPOSE:** The purpose of this study was to investigate adaptations in gross mechanical efficiency during asynchronous hand-rim wheelchair propulsion of novice able-bodied participants following 4 weeks of practice.

**METHODS:** Twenty seven male participants performed a series of five, 4-minute sub-maximal exercise bouts at  $1.7 \text{ ms}^{-1}$ . Arm frequencies consisted of the freely-chosen frequency (FCF), followed by 4 counter-balanced paced trials pushing at 60, 80, 120, and 140% of the FCF. Gross efficiency (GE) was determined. Participants were divided into two experimental groups (FCF, N = 9; 80% FCF, N = 8) and a control group (N = 8). The experimental groups received a 4-week propulsion practice period ( $3\text{wk}^{-1}$ , 12 practice trials) at  $1.7 \text{ ms}^{-1}$ . Post practice period all groups repeated the five 4-minute sub-maximal exercise bouts.

**RESULTS:** The GE increased in both experimental groups (+1.5 & 1.4%) compared to the control group (+0.2%) ( $P = 0.001$ ). Arm frequency decreased at FCF in both experimental groups ( $P = 0.001$ ), however, larger changes were observed in the FCF experimental group.

**CONCLUSIONS:** Four-weeks practice had a beneficial effect on metabolic cost and GE. This improved GE appeared to be as a result of the changes in the self-selected arm frequency in both experimental groups.