Ability of test measures to predict competitive performance in elite swimmers.

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Abstract: The purpose of this study was to quantify the relationship between changes in test measures and changes in competition performance for individual elite swimmers. The 24 male and 16 female swimmers, who were monitored for 3.6 years (s = 2.5), raced in a major competition at the end of each 6-month season (3.6 competitions, s = 2.2). A 7×200-m incremental swimming step-test and anthropometry were conducted in up to four training phases each season. Correlations of changes in step-test and anthropometry measures between training phases and seasons with changes in competition performance between seasons were derived with repeated-measures mixed-modelling and linear regression. Changes in competition performance were best tracked by changes in test measures between taper phases. The best single predictor of competition performance was skinfolds for females (r = -0.53). The best predictor from the step-test was stroke rate at a blood lactate concentration of 4 mmol · l-1 (females: r = 0.46; males: r = 0.41); inclusion of the second-best step-test predictor in a multiple linear regression improved the correlations (females: r = 0.52 with speed in the seventh step included; males: r = 0.58 with peak lactate concentration included). In conclusion, a combination of fitness and technique factors is important for competitive performance. The step-test is a useful adjunct in a swimmer's training preparation for tracking large changes in performance.

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