successively conducted testing cycles, the distance covered during the Cooper test was longer with each cycle. Lower post-training lactic acid level was determined in cycle III as compared with cycles I and II. Similar results were observed in the case of free fatty acids, glucose and growth hormone levels. Decreases in leptin levels were significant in cycles II and III.
DISCUSSION & CONCLUSION Training induced decrease in the biological cost of 60 minutes' physical effort, and improvement in the endurance level in the tested female swimmers. Lack of adverse hormonal response, continuous anabolic-catabolic balance, stable energy profile and maintenance of similar body mass are indicative of beneficial health-promoting effects of the training.
KEY WORDS Swimming training, anabolic-catabolic balance, leptin

Qualitative versus quantitative analysis of the behavior patterns of the elite butterflyers

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OBJECTIVE The purpose of this study was to find patterns in the swimming technique of butterfly based on Behavioral Observation System of Technical and compare the data obtained from the kinematic analysis (quantitative).
METHODS In the analysis of temporal patterns (T-pattern) and a sequence of five cycles gestures executed at maximum speed at 25 meters, studied the behavior of three technical elite swimmers of Portuguese participants in the Olympics, with a record 259 and a full alphanumeric codes 120 configurations. The instrument based on a mixed system of categories and field formats, with technical features observed during the execution of hand cycles. The validity was assured by the index of intra-observer reliability (95%) and inter-observer accuracy (96%). To detect patterns exist, each swimmer, using the Theme 5.0 software, which allowed to identify the stable structures of technical performance within a critical interval of time ($P < 0.05$) - t-patterns. To compare the data we performed a kinematic analysis. The calculation of kinematic variables was performed by software Ariel Performance Analysis System (APAS).
RESULTS The patterns were different, adjusting to the characteristics of technical implementation of the swimmers. Each swimmer may display settings with different levels of complexity of structure, depending on the implementation of changes within the hand cycle. By comparing the codes with the kinematical values found that complement and show the same information.
DISCUSSION & CONCLUSION The potential quality of this instrument is evident by the patterns obtained from a temporal sequence and that when faced with mathematical models describe the same information.
KEY WORDS Technical Analysis, Patterns; Butterfly; Chronology; Kinematics

Observation of the stability of a technical implementation of evidence in 200m butterfly

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OBJECTIVE The aim of this study was find patterns in the swimming butterfly technique at a distance of 200 meters using the system Behavioural Observation System of the Technical Butterfly, qualitative analysis allows the observation and study of the stability of the technical implementation.
METHODS Instrument for ad-hoc, with the structure of the instrument based on a mixed system Categories and Field Formats which we can record specific techniques observed during the gestual cycles. We performed the analysis of temporal patterns (T-pattern), a sequence of five gestual cycles of the butterfly style in each part of 50 meters. To study the sequence of codes and their interaction representative of the technician in two swimmers at the national level. Swimmers performed the tasks with speed competition, with the same control by the GBK PACER. To detect the

temporal patterns of each swimmer, using the Theme 5.0 software, which allows to identify the structures of the technical standard within a range of critical time ($p < 0.05$) - T-patterns
RESULTS In the results the patterns found settings are different and different levels of complexity depending on the adjustments made by the swimmers in gestual cycles. Variations of codes in each time producing different settings, to determine the differences between cycles of the swimmer.
DISCUSSION & CONCLUSION Comparing patterns found distinct differences between swimmers, the records demonstrated a clear behavioral similarity when compared the result with the biomechanical model of the general butterfly technique. Technique is objective for the purpose it was created and is a valuable instrument for qualitative analysis.
KEY WORDS Technical Analysis, Stability, T-Patterns, Butterfly, Temporal

Training control in young female swimmers: a case study

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OBJECTIVE The need to improve competition times encourages coaches to use different methods to control the training process. However, not always, the available processes are easy to be applied in a large group of female competitive swimmers. Furthermore, the use of some tests in young swimmers is questionable. Hence, the aim of this study was to apply a simple protocol to assess the process of training in a group of female swimmers.
METHODS Eleven female swimmers participated in this study (11.45 (0.52) years old, 1.50 (0.08) m, and 39.81 (7.84) kg). All the swimmers belonged to the same swimming club. After 3 weeks of general training tasks, the swimmers were engaged in a 9 week training period in order to prepare the participation in the Regional Championship. During this period the swimmers performed 6 units of training per week (week 1: 19.0 km, week 2: 22.0 km, week 3: 22.0 km, week 4: 24.0 km, week 5: 26.0 km, week 6: 23.0 km, week 7: 25.0 km, week 8: 26.0 km, week 9: 21.6 km). Every Thursdays, after a 30 min warm up each swimmer performed two trials of a 50 m front crawl all out test, with a 15 min rest. Only the best performance was used to control the training process. A repeated-measures analysis of variance with Bonferroni adjustment was used to analyze the differences between the mean values of each week performance. The significance level was set at $p<0.05$.
RESULTS 50 m performance did not change during the first three weeks of training ($p>0.05$). In the week four the performance significantly decreased (week 1: 39.09 (4.51) s, week 4: 39.86 (5.12) s; $p<0.05$). The present study also showed no significant differences in performance between week 1 and weeks: 5, 6, 7 and 8. Nevertheless, at the last week of preparation there was a performance enhancement (week 9: 38.72 (4.38) s, $p<0.05$).
DISCUSSION & CONCLUSION With a simples and easy test it was possible to monitor swimming training. We believe that these data could be used by coaches to control training in young competitive swimmers and simultaneously promote some adjustments during the preparation. Here, we were able to notice a performance improvement in the 50 m front crawl trial during the last week of training, before the competition, which corresponded to a decrease in the overall training volume. It seems that in short distances events the reduction of training volume could enhance young competitive swimmers performance.
KEYWORDS Performance, training volume, monitoring, short distance events.

Training evaluation in male age-group swimmers

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OBJECTIVE Monitoring the training process represents an important task during sports preparation. However, not always the applied protocols help to address the coaches´ concerns, namely regarding its complexity and difficulty to be used in large samples. Therefore, the aim of this study was to apply a simple protocol to control the training process in a group of male age-group swimmers.
METHODS Thirteen age-group male swimmers were involved in this study (12.46 (0.52) years old, 1.53 (0.10) m, and