"Kinesiology" for the forty-fourth time and it will not be the last!
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**Jerzy Januszewski, Edward Mleczko, Renata Nieroda**

Morphological age and the girls' selected components of the health-related fitness (H-RF)

**The goal of the researches.** To find out what is the function of the particular morphological age components in diversification of the individual components of the physical activity according to the health convention and to describe, in the main periods of ontogenesis, the effectiveness limit of the relativeness methods of the physical activity convention's basic components using the traditional formula estimating the morphological age.

**The subject.** Among 5229 girls at the age of 8–17, tested in 1996–2005 in Malopolska region, 150 individuals in three age groups of 8–9, 12–13 i 16–17 were chosen. In total, the results of the basic components of the physical activity elements (morphological, skeletal-muscular and circulatory-respiratory) deriving from 900 female individuals from primary and secondary schools of the Polish regions (Malopolska, Podkarpacie, and Świetokrzyski) were taken into consideration. Such selected community (each 150 individuals) was divided into three groups (each 50 individuals). The division criterion was the morphological age, which was the biological development measurement. To estimate the statistical analysis only subjects from two extreme variables ranges were considered. The other numbers of the tested located close to the median were not included in further statistical analysis.

**Methods.** In the age groups and the extreme fractions of the tested, chosen according to the morphological age, the SD value of the physical activity components enclosed in H-RF was estimated. It enabled to normalize the 0 and 1 level of the intergroups differences and to describe their statistical significance. To estimate the strength between independent variable (the morphological age) and dependent variables (the physical activity of H-RF components) Pearson’s correlation and part-correlation methods were used. The significance of the intergroups differences and correlation coefficients were tested by t-Student test. The arithmetic means, Pearson’s correlation and part-correlation coefficients’ values were described as the statistical variables with at least 5% (p < 0,05) importance level.

**The results.** The part-correlation was extremely helpful in claiming there was a great importance of the calendar age in determining the morphological age. The body mass age and body height age, as well as the calendar age, had a great influence on the numerical value of the tested female groups. The morphological age influenced mostly the kinetic and functional components especially among the individuals in the junior and puberty period.

**Summary.** The results of the advanced statistical method justify not always appreciated need of introducing the calendar age to the mathematical formula describing the biological age. The morphological age complying the body mass age, body height and the life length (the calendar age), can be a factor deducting the biological development from the kinetic and functional components of the physical activity in the health convension. From the adolescence period the morphological age influence on described parameters suppresses.

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**Krystyna Rożek, Tomasz Ignasiak, Jerzy Rafał Piechura**

Assessment of chosen functional respiratory parameters of women in the light of the urbanization factor

**The aim of the study.** Evaluating chosen functional parameters of the respiratory system of women in the light of the urbanization factor.

**Material and methods.** Material under investigation has been consisted of 135 women divided into two groups according to urban factor: 99 women, the villagers staying in the sanatorium in Szklarska Poreba, made up the first group, the others, 36 women, citizens of Wrocław, formed the second group. The basic somatic traits, such as height, body weight and basis of body mass index (BMI) were investigated. At all women values of functional respiratory parameters were measured using the apparatus Flowscreen of the Jaeger company. They took measurements in a sitting position. The measuring procedures meet with American Thoracic Society criteria. To meet this work needs analysis of curve air flow – volume was done. The following parameters were used for analysis: force vital capacity (FVC), force expiratory volume in once second (FEV₁), peak expiratory flow (PEF) and Tiffeneau indication. Research findings were subjected to statistical analysis using basic descriptive statistics: the average and standard deviation.
The differences between mean values of the analysed parameters were assessed with t-Student’s test.

**Conclusions.** (1) From among the somatic traits, BMI diversifying investigate women group only. (2) Women living in the countryside are characterized by higher functional parameters of the respiratory system.

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**Marek Zatoń, Krystyna Zatoń, Agnieszka Zygadło**

Changes in kinaesthetic differentiation capacity in the ski learning process

**The aim of the study.** To investigate the changes occurring in kinaesthetic differentiation capacity as a result of ski exercises. It has been assumed that in the process of learning new motor skills the sensations generated in the motor apparatus are increasingly differentiated, and that can be measured using the methods described hereunder.

**Methods.** The standard deviation from the initial model pressure expressed in kG and referred as pressure repeatability indicator (WP) has been defined as the measure of kinaesthetic sensitivity (kinaesthetic differentiation capacity). Pressures have been exercised alternately by the right and left foot on the kinesiometer platform equipped with tensometric sensors. They were then quantified through the medium of an analogical-digital processor and collected into individual files by a special computer programme. The measurement of the progress made in learning ski techniques (Haczkiewicz test) in the research was carried out in the same way as the tests undergone by students on the first day of their ski programme to divide them into competence groups. The run times were measured to 0.01 second. The data was collected between the second and the ninth day of the ski programme. The progress was measured classically on a simple slalom. The test trajectory was defined by 10 single slalom poles disposed with 10 meter intervals. The slope inclination was 15–20 degrees.

**Conclusions.** In the process of motor learning (skiing) the perception of the sensations generated in the motor apparatus is progressively perfected. It has been confirmed that impulses from the motor apparatus and touch receptors can play an essential role in developing cutaneous and muscular sensitivity, which is proved by tests in ski boots and sport shoes. Multidimensional relationships between kinaesthetic sensitivity indicators and the efficiency of ski learning point to the fact that the sensitivity of the signals linked to conscious motor perception can change along with the progress in motor learning.

It is of fundamental importance and must be confirmed in other fields (swimming, shooting or figure skating).

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**Urszula Sabat**

The value of mental training components introduced to the programme of downhill ski teaching

**The aim of the work.** The aim of the work is the analysis of the components of mental training that have been introduced to the teaching programme of alpine skiing.

**Material and methods.** The efficiency of teaching has been assessed. The study has been conducted by means of experiment using parallel groups. The subjects of the study were second-year, full time students from the Tourism and Recreation Department, Academy of Physical Education in Wrocław. The students have been divided into two groups: control and experimental. Attempts have been made to compare the results from the final test in those two groups. In the experimental group, additional classes containing elements of mental training have been introduced to the teaching programme. They dealt with relaxation, concentration, fear, visualization and self-esteem, and self-confidence elements. Remaining elements of the training were identical in the two groups.

**Conclusions.** Despite the shorter length (6 days) of the experiment, the experimental group students obtained much better results on the final test than the control group students (p < 0.05). This might indicate that they had better results in the process of learning and teaching skiing. They were also optimistic and eager to participate in the classes.
Iwona Wierzbicka-Damska, Eugenia Murawska-Ciałowicz, Ewa Bakońska-Pacoń, Agnieszka Jastrzębska

Correlation between body build, physical efficiency and sport result of sportsmen in two ski disciplines

**The aim of the work.** Sport training is a specific and long lasting process aimed at obtaining maximal physical efficiency in a given sport discipline. Hypothetically, the long lasting influence of specific training methods will exert oriented changes in body mass components proportion.

**Summary.** These changes are not passive mirror of training effects only, but they contribute better somatic results of physical work.

Body build and composition estimate of change of physiological marker, diagnostic value and about functions of structures biochemical decide. Has meaning in estimate of structural change evoked sports training also. The majority research were directed on influence of different form of training on body composition resisted on determination of changes and differences mainly, without their deepest analyses of revolts. Usefulness of somatic characteristic try to exert between other in selection of candidate for given sport disciplines and prove legitimacy of taking into consideration of its in look-ahead of training effects. We have accepted foundation in our research, direction of somatic training change is process of adaptation from physical work, depending on character of training differentiated and type of sports discipline. We have carried estimate of difference for determination in structure these conditionality and body composition, disciplines of sports differentiate taking into account distinctly in respect character load training.

The results of our experiments may contribute to explain the relation between certain training methods and body composition. These research are enter to long-range peculiar estimate of training influence. The results received indicate that specific training programme of given sport discipline can change the body composition for better possibilities of performing physical efforts. The importance and value of these changes are further to determine.

Gotten results indicate, that peculiar training can change of body composition in given discipline of sport for forming of better capability of execution of physical work. Speed of generation of this change and however, they are not explained their constancy, it requires that in our programme farthest expected research.

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Beata Gastoł, Jerzy Cempla, Marcin Maciejczyk, Janusz Włodek

The aerobic capacity in young rowers determined using original graded test on rowing ergometer Concept II

**The aim of the researches.** The aim of the study was to characterize a new, original method of workload applying in graded test during rowers' examination and to put this method to use in evaluation of aerobic capacity in rowers.

**Material and methods:** The study involved six rowers AZS-AWF Krakow aged 16–19 years old. The rowers performed the graded test “until exhaustion” on rowing ergometer Concept II. Test began 4-minutes effort performed with workload 60 W and next, every two minutes, workload increased about 30 W. During the test, the basic parameters of cardiopulmonary system were measured. Originality of protocol resulted from continuous character of performed effort and from possibility of individual adjustment of rowing rate.

**Results and conclusions:** A new protocol allows to indicate the level of metabolic thresholds on the basis of changes of ventilatory parameters during the test – accordingly the three metabolic zones were indicated. The results of the test could be useful to objectification of matching training intensities. The applied protocol characterizes the lack of breaks during the test, multiple blood sample taking and possibility of individual adjustment of rowing rate. The proposed protocol is useful to routine control of training process. The level of aerobic capacity and amount of physiological parameters on the level of metabolic thresholds in young rowers (taking into account: the advanced in training process, sports level and term of examinations in annual training cycle) is satisfactory.
Dariusz Kruczkowski, Jarosław Jaszczur-Nowicki

Body balance maintenance ability in the conditions after physical effort loading

Introduction. Effective human physical acts require proper level of muscles and systems cooperation. In sport disciplines, where the base of training improvement is formed by energetic abilities (endurance and strength), it is important to ask a question about the movement coordination efficiency in the conditions of maximal work, realised during trainings and competitions.

The aim of the work. Evaluation of body balance maintenance ability level in the rest and after work conditions in various sport disciplines athletes groups has been done in this work.

Material and methods. Top windsurfers and rowers took part in the researches. Posturography method was used when the measurements took place. All the athletes had to perform special physical effort tasks. Furthermore, body balance maintenance ability in rest and after work conditions in gymnasts was measured during two selected training micro-cycles.

Results. Individually marked tendency in human stabilization abilities improvement after work may suggest human body adaptation to balanced behaviours influenced by fatigue. This could point out the possibility of special physical fitness improvement though coordination adaptation on physical effort also endurance one. This character physical effort and stimulating the auricular organ using the angle acceleration can influence on manifesting the movement action technique execution, which leads to particular sport result.

Conclusions. Therefore, independently from the kind of effort or the nervous system loading significant remains the fact regarding the body balance system sensibility on this type of stimuli. It seems to be very reasonable that body balance maintenance ability evaluation may appoint the values of training load and may become the measure of its optimising and individualising.

Dariusz Gierczuk, Jerzy Sadowski, Vladimir Lyakh

Accuracy and diagnostics informativeness of computer tests evaluating coordination motor abilities in wrestling

Introduction. A proper control of coordination motor abilities (CMA) requires adequate research tools. These include the tests belonging to the Vienna Test System (VTS). As far as the literature of combat sports is concerned, it is noticeable that, particularly in the case of wrestling, there are not enough data concerning the measurement of CMA with the use of computer tests, e.g. according to VTS.

The aim of the work. Therefore, the aim of my work was to evaluate selected reliability criteria of computer tests included in VTS and used in wrestling.

Material and methods. Students from the sports school SMS in Radom who practise Greco-Roman wrestling took part in the examination (n = 15). The reliability of applied tests was evaluated on the basis of two criteria, i.e. accuracy and diagnostic informativeness.

The research was conducted on the basis of VTS. Twenty-one indexes were subjected to the analysis. These indexes characterise 5 CMA, i.e. speed of reaction, including simple reaction (RT version S1) and complex reaction (DT version S1), as well as space orientation (SIGNAL version S2), movement combining (2HAND version S2 and MLS version S1), motor adjustment and movement frequency. They were evaluated by means of various indexes of MLS test (version S1).

Results. On the basis of the research conducted it was borne out that all of the analysed indexes were characterised by sufficient accuracy coefficients. The tests evaluating speed of reaction, space orientation, movement combining, movement frequency and motor adjustment met the assumed criterion. As for the coefficients of diagnostic informativeness, in most cases they were not lower than 0.3. Here the indexes measuring movement combining, complex reaction, space orientation and motor adjustment turned out to be the most accurate, whereas in the case of simple reaction and movement frequency the were the least accurate.

Conclusions. The obtained coefficients of accuracy and diagnostic informativeness in the analysed indexes prove the usefulness of the tests in the diagnosis of CMA in wrestlers as they meet the requirements of sports metrology.
Introduction. Problems of elderly people have a lot of interest from several disciplines of science due to the progress of aging society syndromes. Slow gradual increase of the average human lifespan allows presupposing that nearest future will bring increase of senior’s population. At the end of 2000 the percentage of 65-year-olds and older citizens was 12.3%; five years later (2005) it was 13.38% of the population of Poles as a whole. According to demographic prognosis of GUS this rate is going to rise up to 31.6% by the end of 2050. That information shows the importance of doing research on this field, such as checking physical efficiency of seniors. The Fullerton Functional Fitness Test, developed by Rikli and Jones, is one of the best tools for estimating a large number of aspect of senior’s physical efficiency and fitness. The other test, which may be useful only when examining the risk of fall, is Performance-Oriented Mobility Assessment (Tinetti test).

The aim of the work. To examine the conformity of the Fullerton Functional Fitness Test and Performance-Oriented Mobility Assessment as the tools for estimating the risk of fall in the group of seniors.

Material and methods. The research group consists of 64 women at the age of 65–98, habitants of the DDPS in Poznań. Arithmetic mean of that group was 76.8. The participants were examined with the help of the Fullerton Functional. The second method was Tinetti test (POMA), useful to estimate risk of falling of elderly people. First method consists of several elements, which are important when estimating the aspects of comprehensive fitness. One of them, “8-foot up-and-go test”, is helpful to measure complex coordination of movements. Since the construction of this test is similar to another “up-and-go” test, used to estimate fall risk, it needed comparing and assessing whether it might be regarded as a reliable source of estimating fall risk in the group of seniors. The researchers proved strong statistical dependence between this test and POMA, and, as a result, the possibility to compare the measurements with the use of correlation between these two elements. The Fullerton Functional Test was compared to Tinetti test with the help of Pearson’s Correlation.

Results. There is a very strong statistical dependence between POMA and the Fullerton Functional Fitness Test. There was made a scale for these two tests, after that both tests were compared and finally a fifth-gradual scale of risk falls for people examined with the help of the FFFT was constructed.

Conclusions. (1) It is possible to use “8-foot up-and-go” trial as a rate for estimation of risk of fall of the 65-year-old and older women, with no need to use other tests, such as POMA. (2) It is crucial to do complex re-examination after five years. Among the participants, there should be retired women and men. The re-examination may give the researchers a unique chance to determine in details the progression of risk of fall.

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**REVIEW PAPERS**

**Vladimir Lyakh, Przemysław Bujas, Zbigniew Witkowski, Leszek Gargula, Janusz Jaworski**

The models of motor control processes from the perspective of Russian scientists

The authors attempt to present the achievements of Russian scientists in the field of neurophysiology, neuropsychology and biomechanics, aimed at building a single, coherent explanation of the motor control processes in humans. Except for the Bernstein’s theory, all other ones described in this paper have not yet been presented to Polish readers, though in many aspects they are very innovative, thus worthy of wide propagation. The authors attempt to bridge the gap between knowledge about American and Russian scientific achievements and to show at the fact that besides the popular in Poland, mainly American concepts, important attempts at explaining this phenomenon – to our opinion successful – are undertaken also in other countries.