

BIOMECHANICS OF STATODYNAMIC STABILITY FOR THE ATHLETE'S BODY AND BODY SYSTEM

**Viktor Boloban, Tayana Mistulova,
Ukrayinsky Gosudarstvenny Universitet Fizicheskogo Vospitaniya i Sporta,
Kiev, Ukraine**

KEY WORDS: athlete's body and body system, statodynamic stability, balancing function

INTRODUCTION: University sports events - gymnastics, acrobatics, diving, trampoline, figure skating, etc. - represent artificial motor forms with complex coordinating structures. The major trends in their development are toward increasing complexity of competitive programs and improving performance mastery. The theory and practice of modern athletic training have proposed a number of didactic requirements and rules for the educational process, i.e.: teaching sports exercises without re-learning, achieving high quality, stability and reliability of exercise reproduction under training and competitive conditions.

METHODS: Investigations of the equilibrium of the athlete's body and body system discover biomechanics of motor interaction for athletes-partners performing exercises of acrobatics, figure-skating elements, etc.

Tasks: 1. To measure static stability in equilibrium for the athlete's body and body system during the performance of acrobatic exercises and figure-skating elements.
2. To examine connections and relations between the indices of statodynamic stability for the body and the indices of statodynamic for the body system (a pair of athletes) and their athletic achievements.

Organization: The following items were used during investigations: stabilography, accelerography, video-cineregistration, tests, basic and control acrobatics exercises and figure-skating elements, expert estimation, mathematical statistics. Ten highly skilled acrobatic and sports pairs were used as subjects.

RESULTS: Maintenance of statistic and dynamic stability in equilibrium for the athlete's body is achieved by minimized oscillation amplitude, frequency and period, stability duration. The features of maintained body equilibrium are connected with the functional responsibilities (role) of athletes-partners. The athletes performing as higher ones are more stable in static postures and dynamic equilibrium. A valid contribution of the higher partners to the stability of the body system by indices of body-equilibrium motor skill has been registered. A high level of individual statodynamic stability characterized by oscillation frequency and stability duration for body.

A leading role of the lower athletes in maintaining stability duration has been established. To maintain the statodynamic stability of the body system, the athletes perform motions of horizontal, vertical, bending or twisting character individually or jointly in their different combinations. The stability of the body system depends directly on the skill of performing work postures formed and balancing function.

REFERENCES:

1. Bretz, K., Kaske, R. J. (1994). Postural Control and Movement Coordinational Skill. In *Second World Congress of Biomechanics*. Amsterdam, Netherlands.
2. Enoka, R. M. (1994). *Neuromechanical Basis of Kinesiology*. 2nd ed. Champaign, Ill.: Human Kinetics.