

## Original research papers

# DIRECTION AND VELOCITY OF THE BALL IN VOLLEYBALL SPIKE DEPENDING ON LOCATION ON COURT

PIOTR TABOR<sup>1</sup>, CZESŁAW URBANIK<sup>2</sup>, ANDRZEJ MASTALERZ<sup>2</sup>

*Józef Piłsudski University of Physical Education in Warsaw, Faculty of Physical Education, Department of Theory and Methodology of Physical Education<sup>1</sup>, Department of Anatomy and Biomechanics<sup>2</sup>, Warsaw, Poland*

Mailing address: Piotr Tabor, Józef Piłsudski University of Physical Education in Warsaw,  
Faculty of Physical Education, 34 Marymoncka Street, 00-968 Warsaw, tel.: +48 22 8340431 int. 567,  
fax: +48 22 8651080, e-mail: piotr.tabor@awf.edu.pl

### **Abstract**

**Introduction.** The aim of this study was to determine the correlations between the direction and velocity of the ball in volleyball spike. We adopted the hypothesis that the direction of an attack is dependent upon the arrangement of the pectoral girdles in the phase of flight. **Material and methods.** The research was carried out for four different types of attacks: from the left side of the court down the line (A) and in the cross-court direction (B) and from the right side in the same directions (C and D). Sixteen young volleyball players from a Sports Championship School run by the Polish Volleyball Federation were examined. **Results.** The analysis of the results showed different ball velocities in different attacks. The velocity was the lowest in attack B and the highest in attack D. **Conclusions.** The direction of attack was produced by hitting the ball in a non-central manner and by aligning the glenohumeral joints diagonally to the net.

**Key words:** biomechanics, ball direction, volleyball spike, cinematographic method