

## Innovative Tests During Control Psychomotor Function by Qualified Handballers

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**Introduction.** Some, training devices hold a prominent place in teaching sportsmen the handball playing technique (Leykin, 1999). The others unite separate elements of the technique into a whole movement. When specific capacity is developed properly and training devices are used skillfully, sportsmen acquire reasonable technique. In case there are mistakes during technique attainment, then the training devices are used for their elimination (with the selective influence on separate elements or the whole technique) (Popov, 1999).

Generalized present-day knowledge of fundamentals of facilities allows us to choose the most advanced applications of exercise machines or new generation devices for workout process (Vodlozerov, 2011; Mokina, 2008). The issue is that correct goal-oriented use of exercise machines brings positive results and great achievements in sports (Alabin, Skripko, 1979). We can assume that the correct choice of exercise machines for workout sessions or testing is an important stage in the use of facilities. They are indispensable for the management and efficient workout process, which gives opportunity to promptly and objectively collect information about readiness of a sportsman's body (Yushkevich, Vasyuk, Bulanov, 1989).

Our own experience of scientific-practical work with combine teams and teams of Super league of Ukrainian championship, analysis of modern literature, devoted to this problem, give understanding that today one of problems is discordance of theoretical works about sport games and their insufficient implementation in practice. It permits for us to think this problem to be really urgent.

**The Aim of the Research.** Justification the control of training by qualified handballers with special technical devices.

**Methods.** This study included 85 male highly qualified handballers (age=23,48±3,68 years) from candidate master of sports (CMS) to international master of sports (IMS) of Ukraine by three teams competing in the Super League Ukraine «Motor», «ZTR», «ZNTU-ZAB» Zaporizhzhya. Teacher supervision took one microcycle (3 days). The objectivity of the information has been provided by adherence to the standard conditions:

- teacher supervision was performed in the morning from 9.00 AM till 12.00 AM;
- exercises for evaluation have been performed after a basic lead-in and warming up of qualified handball players;
- the results of psychomotor function have been determined at a separate training session;
- repetition of exercise (tries) has been performed after a rest and after the sportsmen reached the heart rate below 110 bpm.

**Exposition of the Basic Material of the Research.** In order to evaluate special condition (psychomotor function) of handball players, analysis of standard practices and specific character of competition-based activity in handball allowed us to propose and implement the following test exercises into the workout process of qualified teams of the Ukrainian Super League: the Flashlight Test (FIT), the Flashlight Handball Throw Test (FHIT) and the Complex Flashlight Handball Test (CFIHT). They are of crucial importance in most game situations and to the full extent reflect the following technical and tactical actions of players and a team during competitions:

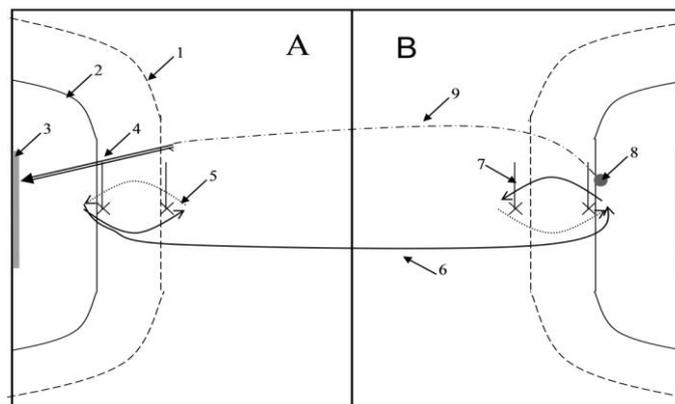
- active counteract to the attack of the opponents;
- correction of technical and tactical actions in response to the change of the system of offense;
- switch of defensive players while marking offense;
- performance of backup and parallel movement in defense;
- performance of attacks and defensive technical and tactical actions in the setting of numerical disadvantage, majority in number etc.

The Flashlight Test (Tyshchenko, 2014) allowed us to determine the attention switch rate and special capacity of handball players under conditions of active choice of useful information. The structure of exercise performance was the following: 5 stands with LED lamps were located in the center of the 9-meter line (line of active defense).

It should be noted that LED lamps have been used as a signal stimulus during performance of an exercise. The flash of one or another lamp was controlled by computer application of basic random numbers. The distance between the stands was 1 m. A handball player started doing the exercise from the middle of the 6-meter line (the goal line). On a coach signal, the sportsman dashed from the standing start to the stand, where the light flashed. When he touched the stand, he ran back to the starting place. During the exercise

performance the number of touches of the stand during 30 second has been counted. To get the better result qualified handball players had two tries for the performance of this exercise.

The sportsmen have performed the Complex Flashlight Handball Test (CFIHT) from the standing start on the signal of a coach (Fig.1).

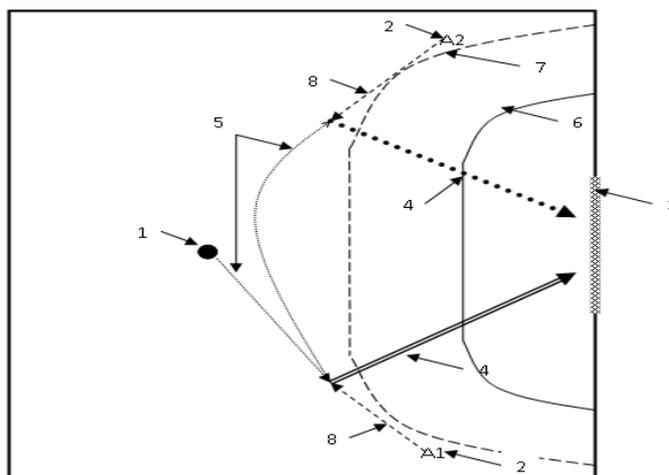


**Fig. 1.** Complex Flashlight Handball Test (CFIHT) performance scheme:  
*A, B – halves of the playground, 1 – 9-meter line (line of active defense), 2 – 6-meter line (goal zone), 3 – goal, 4 – throw, 5 – backward run, 6 – forward run, 7 – stands, 8 – ball, 9 – dribbling*

It involved performance of the basic technical and tactical actions in handball: movement with change of direction, ways of movement (forward and backward, sidesteps and cross steps), ball pickup and dribbling throw of the ball on the goal square, above which the light flashed. To provide performance of the exercise in the middle of the 6-meter line (goal line) and 9-meter line (active defense line) the stands (4 in all) have been located on the both sides of the playground. The performance of this exercise started from the 6-meter line and involved three runs around the first couple of stands on the first half of the playground acceleration to the second half of the playground (B) and tree runs around the second couple of stands. After this, the ball, located near the stand at the 6-meter line of the second half of the playground, was picked up, then - dribbling from the 9-meter line of the first half of the playground, and the jump shot was performed on the same half of the playground. It should be noted that the stands have been run around (on the A and B halves of the playground) forward to the central line. In this wise the sportsman ran forward from the 6-meter line to the 9-meter line, and backward from the 9-meter line to the 6-meter line. Running in this section from the one half of the playground to the second one and dribbling were forward. The time for performance of the test exercise has been registered from the moment the sportsman started the movement on the 6-meter line until the ball crossed the goal line.

With the help of the Flashlight Handball Throw Test (FIHTT) the rate of technical competence has been monitored in game situations, related to active attacks, in situations of set offense, as in counter-attacks and in drawing of standards. The performance of this test exercise involved the use of basic effectively significant technical and tactical actions during attack by qualified handball players: movement with change of direction, way of movement (forward and backward, sidestep and cross-step), handling, throwing the ball on the goal.

The content of the routine involved alternate regulated performance of throws on the goal by qualified handball players after handoff from co-instructors. Starting location for the exercise – 12 m from the face line (3 meters from the 9-meter line of active defense). The sportsmen had two acceptance trials, the best of which was scored (Fig. 2).



**Fig. 2.** Flashlight Handball Throw Test (FIHTT) performance scheme:

1 – sportsman, 2 – co-instructors, 3 – goal, 4 – throw, 5 – sportsman's movement, 6 – 6-meter line of the goal zone, 7 – 9-meter line (line of active defense), 8 – handling of the ball from the co-instructor to the sportsman

The sportsman must alternately perform throws from the 9-meter line after movement along it to one or another side. It should be noted that the throws have been performed into the goal square, above which the light flashed. The total time for performance of the exercise was 30 sec and it has been recorded from the moment the first throw had been made. Within this time the number of balls, thrown exactly into the relevant areas, has been calculated.

**Discussion.** The study of various types of psychomotor response of sportsmen has not only theoretical, but, in the first place, practical importance in the selection of space-time regimens for movements management when teaching techniques of new exercises and performing set of exercises. The two components can be distinguished in the motor response: sensor, which is characterizing information perception, and motor, which is directly responsible for the movement. However, in the setting of competition-based activity, handball players must display the complex of these components in a good manner.

In this wise, we can state that training facilities for improvement of significant number of specific physical properties (coordination, speed endurance, technical endurance etc) can be used to enhance overall performance of special condition of qualified handball players. In addition, efficient training facilities, aimed at improvement of coordination skills of sportsmen, should be used.

**Conclusions.** During CFIHT, orientation in mid-air, balance in combination with speed performance (agility) are dominating and for performance of FIHT latent time of complex reaction and the time of single movement have the same significance. Coordination skills and the extent to which they are developed are closely connected with formation of technique for sport exercises (Portnov, YU.M. 1996; Bulkin, V.A. 1983). Taking this into consideration, it can be assumed, that the use of facilities, aimed at development of special coordination skills, shall have positive effect on the level of technical competence of sportsmen and, particularly, the realizable component of technical and tactical actions of qualified handball players.

**Prospective of the Further Researches.** Performed research does not cover all the sides of the analyzed problem. It confirms the necessity of precise attention to the further deep theoretical-methodological work and improvement of realization practice for the innovative control system into the preparation system of the higher qualification handball teams. The main goal for the further usage of this information – definition of the potential possibilities, their correspondence to the demands and correction of the preparation process.

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