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## Performance of the twimyo nopi ap chagi test

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### Summary

The competition of taekwon-do (ITF) is a tetrathlon and consists of: patterns, sparring, power breaking and special techniques. The last one is very spectacular, unique for taekwon-do and consists of five tests [1,2]. The flaying rising kick (timyo nopi ap chagi) is the simplest and the best measurable test; the role of referees is limited to observing and scoring. The Twimyo Nopi Ap Chagi jump test using the “non-scissors” technique consists of 4 phases: run-up, takeoff, flight and landing. The jump height is determined by the following elements: height of the centre of gravity (COG) at take-off, flight height of COG, length of the kicking leg and angle between that leg and the line perpendicular to the board.

**Key words:** Taekwon-do • Special techniques • Jump evaluation

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## BACKGROUND

The purpose of sport competition is to achieve the best possible results. The competition of Taekwon-do according to ITF (International Taekwon-do Federation) is a tetrathlon and consists of: patterns, sparring, power braking and special techniques [5], the last one being very spectacular and does not occur in other martial arts. That competition consists of five tests: *Twimyo Nopi Ap Chagi* (flying rising kick), *Twimyo Dollyo Chagi* (flying roundhouse kick), *Twimyo Nomo Yop Cha Jirugi* (flying side kick), *Dolmyo Yop Chagi* (flying spinning kick; the target is attacked frontally) and *Twimyo Bandoe Dollyo Chagi* (flying reversed roundhouse; the target is attacked from the side with leg fully stretched) [1,2].

The flying rising kick is the simplest and the best measurable test, the role of referees being limited to scoring. During the jump, the competitors are able to break boards suspended higher than in other tests. Polish record for this test, held by Rafał Włoch, who attained 300 cm using the “non-scissors” technique, has been officially recorded.

The aim of the study was to discuss all four phases of the *twimyo nopi ap chagi* test.

### The *twimyo nopi ap chagi* test – basic considerations

*Run-up:* The purpose of the run-up is to position the competitor so as to generate sufficient vertical

velocity to perform the jump. The length of the run up depends mainly on the competitor’s skill to make use of the generated velocity which, in turn, depends on the strength of leg muscles and co-ordination. In case too much velocity is generated, the subject is unable to control the take-off and the jump height will decrease [3]. Usually the competitors use a straight-line run-up. During the few last strides of the run-up, the competitor adjusts the positioning of the body for the take-off (Fig. 1). In order to do so, the competitor lowers the centre of gravity by bending the knee of the supporting leg.

*Take-off:* The take-off begins at the moment of touchdown of the competitor’s jump foot during the last stride of the run-up. At that moment the competitor’s upper body is leaning backwards. The kicking foot is positioned near the ground far behind the body. Both arms are positioned behind the body. At the moment of touchdown, the subject flexes the knee of the jump leg in order to ease the impact and positions the leg preparing for the powerful flex. At the beginning of the take-off, the kicking leg, positioned in the back, starts to move forward and upward along with the arms (Fig. 2). The swing of arms and the kicking leg have the following purposes:

- To increase the force generated by the reaction to the force exerted to the ground and to create vertical force which enables change in vertical velocity;
- To elevate the centre of gravity during the take-off [3].



**Figure 1.** Changes in the competitor’s body posture during the run-up.



Figure 2. Details of the take-off.



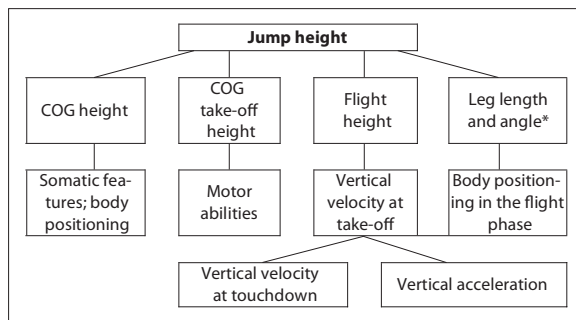
Figure 3. Details of the flight phase [4,6].



Figure 4. Details of the landing phase.

At the moment when the arms and the kicking leg reach an almost horizontal position, the competitor pushes away from the ground by flexing the hip and knee joint of the jump leg.

*Flight:* Most of what happens with the competitor's body is a result of the take-off. Competitors who use the "non-scissors" technique, flex the kicking leg and, at the same time, raise arms. This



**Figure 5.** Factors which determine the final jump height.

\*Angle between the kicking leg and line perpendicular to the target board.

enables elevating the centre of gravity as high as possible (Fig. 3).

*Landing:* A very important part of the test. The landing is one of the factors which make the test successful. The jump leg is now the supporting element. The competitor balances the body so that only the feet touch the ground.

A summary of the abovementioned elements of the test is illustrated in Fig. 5. The diagram shows all essential factors which determine the final jump height.

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