FORCE-TIME CHARACTERISTICS OF FREESTYLE TUMBLE TURNS BY ELITE SWIMMERS


This study examined force-time components, anthropometry, horizontal velocity, distance-in, swim resumption distance and velocity for tumble turns by 19 Australian National front crawl finalists.

Data was collected during 50m sprints in a short course pool from two submerged video cameras and a force platform mounted on the pool wall. Males with a higher tuck index achieved greater peak force and distance-in readings.

The 50m swim time in males was significantly related to increased velocity-in at 2.5m and 5m, and lower 2.5m and 5m RTTs. Swim resumption velocity significantly decreased with lower wall contact times in males but not females. Significant relationships for females were found to exist between larger peak forces and both increased mass and decreased 2.5m and 5m RTTs.

Females recorded increased swim resumption velocity with decreased swim resumption distances and greater velocity-out at 5m. Lower wall contact times in females correlated with faster 2.5m and 5m RTTs.

The time a swimmer takes to complete a swimming event is the ultimate measure of the performance. This event time equals the sum of the times taken starting, stroking and turning; and the contribution of each change over for different distances and different strokes (Thayer & Hay 1984).

Swimming turns were found to occupy 20% of the time for a 50m swimming event in a short course pool, and 30-35% of events equal to, or greater than, 200m (Thayer & Hay 1984). While the greatest portion of any race is spent stroking, the next highest time allocation is for turning.

However, some coaches tend to neglect the importance of turning techniques in training, and rely on the repetitive nature of trial and error practices in long training sessions to produce efficient turns. Records are faster in short course (25m) pools than they are in 50m pools because of the greater number of turns.

A review of research literature is limited because only 20 studies out of 336 cited in a swimming research bibliography dealt with turns (Hay 1981). Since that date, the paucity of research literature on swimming turns has continued. Perhaps research has been limited by the difficulty of investigating turning techniques (Hay 1981).

Due to the importance of turns in swimming events, this study investigated several force, time and horizontal velocity components of the tumble turn by a group of national level front crawl swimmers in order to establish some quantitative, normative values; and to ascertain some of the important features involved.