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Timing Of Upper Body Segmental And Joint Velocities In Skilled Male And Female Golfers: 2566: Board #211 May 29 9:00 AM - 10:30 AM

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It is generally accepted that a precisely timed pattern of proximal-to-distal upper body motion facilitates large clubhead speeds. Furthermore, males and females exhibit different amplitudes of segmental motion during the golf swing. However, it is unknown if gender differences exist in the timing of upper body movements during the swing.

PURPOSE: To examine the timing of upper body segmental and joint velocities during the swing of skilled male and female golfers.

METHODS: Driver data for 19 M (26 ± 7 yr) and 19 F (25 ± 7 yr) golfers with handicaps under 4 were collected using a motion analysis system. 3D peak angular velocities were calculated for the pelvis and thorax segments, and the elbow and wrist joints. From this data, the angular velocity which was greatest (i.e. flex-extension, abd-adduction, or axial rotation angular velocity) was determined and then the timing of this peak velocity was calculated. The maximum differential and timing of the maximum differential, between pelvis and thorax axial rotation angles projected onto the transverse plane (i.e. X-Factor) was also calculated. For all data, the timing of kinematic events was determined as a percentage of the downswing cycle (top of backswing to ball contact).

RESULTS: Clubhead speed was significantly greater for males, $48 \pm 2 \text{ m.s}^{-1}$, compared to females, $40 \pm 2 \text{ m.s}^{-1}$ ($p < .01$). No gender differences were identified for the timing of upper body segmental and joint velocities ([Table 1](#)), peak X-factor (M $54 \pm 10^\circ$, F $55 \pm 9^\circ$) or the period in the downswing cycle where peak X-factor occurred (M $51 \pm 6\%$, F $54 \pm 7\%$).

CONCLUSIONS: There was no gender difference in timing. Furthermore, the sequencing of events for males and females was not in an explicit proximal-to-distal pattern.

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