



## Force interaction and 3D pole movement in double poling.

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Abstract: The aim of this study was to analyze double poling using combined kinetic and 3D kinematic analysis at high skiing speeds as regards pole force components, pole angles and pole behavior during the poling and swing phase. The hypothesis was that a horizontal pole force is more predictive for maximal skiing speed ( $V(\max)$ ) than the resultant pole force. Sixteen elite skiers performed a double-poling  $V(\max)$  test while treadmill roller skiing. Pole forces and 3D kinematics of pole movement at a speed of 30 km/h were analyzed and related to  $V(\max)$ . The duration of the "preparation phase" showed the strongest relationship with  $V(\max)$  ( $r=0.87$ ,  $P$

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