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Relationship between jumps and skating speed in ice hockey.

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Introduction: The purpose of this study was to investigate possible relationships between off-ice jump tests and skating speed. Similar joint/muscle actions and proximal-distal joint activation patterns were described by de Konig et. al.

Methods: Subjects were sixty-six (66) NHL and IHL hockey players. All jumps except CMJA were performed without the arm swing. The vertical jumps were the "static" jump (SJ) with no countermovement, the countermovement jump (CMJ), the counter movement with arm swing (CMJA), the 12" depth jump (DJ) and single leg counter movement jumps (CMJ L/R). Vertical jumps were performed on a force plate and flight times were calculated by vertical velocity at take-off. Two leg (SLJ) and single leg standing long jumps were also performed. On ice speed was measured using electronic, infrared timers. Gates were set at the near blue line (NB) and far blue line (FB).

Discussion: This study demonstrated the vertical jump is a valid fitness test for professional hockey players. Future research needs to explore force-time characteristics of the jumps and their relationships to skating speed. Young et. al. have shown that concentric only conditions in a jump were more related to sprint running starting performance than stretch shortening cycle (SSC) conditions. Like running, as the speed of skating increases the contact time decreases, transitioning from long contact times at the start, to a long stretch shortening cycle action with shorter contact times. McCaw and Hoshizaki reported contact times of 320-420ms and de Boer et. al. reported times of over 700 ms in a skatingstride. The SJ eliminates a stretch-shortening cycle and may closer represent the conditions at the start of skating propulsion phase. However, the SJ correlations with NB and FB were lower than CMJ. Of all measures with a statistically significant correlation, SJ had the largest reduction in strength from the NB to FB times. DJ had the greatest SSC component in the tests. It had the strongest relationship to FB out of all measures and was the only condition which increased strength of correlation from NB to FB times. The change in contact time and contraction characteristics from the shorter NB test to the longer FB may help explain these relationships.

Pearson Correlations

	GLNB	GLFB
GLFB	.776**	
SJ	.707**	.603**
CMJ	.746**	.662**
CMJA	.619**	.527**
DJ	.504**	.728**
SLJ	.424**	.367*
SLJL	.517**	.462*

**Correlation is significant at the 0.01 level (2-tailed)
*Correlation is significant at the 0.05 level (2-tailed)

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