

## THE DODGE MOVEMENT DURING THE LAT PULL-DOWN EXERCISE INCREASED SCAPULA ROM

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### INTRODUCTION

There is a skilled technique, known as the “dodge movement”, in the Beginning Movement Load Training (BMLT) method developed by Y. Koyama (1994). Numerous Japanese athletes, including Ichiro Suzuki (Mariners) and Isao Aoki (golfer), have trained with the BMLT technique. The dodge movement at lat pull-down exercise involves rapid supination and then pronation of the forearm at the transition from the eccentric to concentric contractions under rather relaxed conditions. The BMLT movement is expected to suppress the coactivation of agonist and antagonist muscles, and thereby enhance optimal power output during multi-joint movements (ISEK 2004, ACSM 2005). The purpose of this study was to determine the effect of the dodge movement during the lat pull-down exercise on the ROM of the scapula.



**Figure 1:** Lat pull down exercise with BMLT machine.

### METHODS

Five healthy male subjects (28.6±5.1 yrs; 1.72±0.37 m; 71.2±3.8 kg), who were familiar with the BMLT, performed the lat pull-down exercise under the condition of having or not having the dodge movement at a moderate speed (ca 1.6 s per cycle) with a load of 30% 1RM (Fig. 1). Two digital video cameras operating at 60 Hz captured the entire motion for subsequent measurement of the superior and inferior angles of the scapula,

L1 lumbar SP, elbow and wrist joints of the right side. The locations of the superior and inferior scapula angles were identified and marked by palpation before the experiment, and the medial-lateral and elevation-depression displacements were determined.

### RESULTS AND DISCUSSION

The vertical displacement of the wrist joint in the up-down direction was not significantly different for the two conditions. In contrast, the ROM in the medial-lateral and the elevation-depression directions for scapula angles were greater when the dodge movement was performed during the lat pull-down exercise compared with when it was not performed (Table 1). The maximal ROM of the superior and inferior scapula angles during the lat pull-down exercise with the dodge movement were 4.3 and 11.4 cm, respectively, in the medial-lateral direction and 4.3 and 7.5 cm, respectively, in the elevation-depression direction.

### CONCLUSION

Inclusion of the dodge movement during the lat pull-down exercise increased the range of motion of scapula.

### REFERENCES

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2. Koyama Y, et al. Scapular kinematics and EMG activity of the lat pull-down with a dodge movement. *Medicine and Science in Sports and Exercise*, 37:5 Supplement (in press).

### ACKNOWLEDGMENT

Supported by Grant-in-Aid for Scientific Research, Japan (No: 15650137)

**Table 1:** Average displacements of the superior and inferior angles of the scapula (Values are mean ± SD)

Dodge Movement	Superior Angle (cm)		Inferior Angle (cm)	
	Lateral Displacement	Vertical Displacement	Lateral Displacement	Vertical Displacement
Absent	1.50 ± 0.43	1.28 ± 0.26	6.98 ± 0.90	4.24 ± 0.86
Present	3.12 ± 1.24*	2.76 ± 1.00*	9.98 ± 1.25**	6.46 ± 1.37*

\* P < 0.05; \*\* P < 0.01