



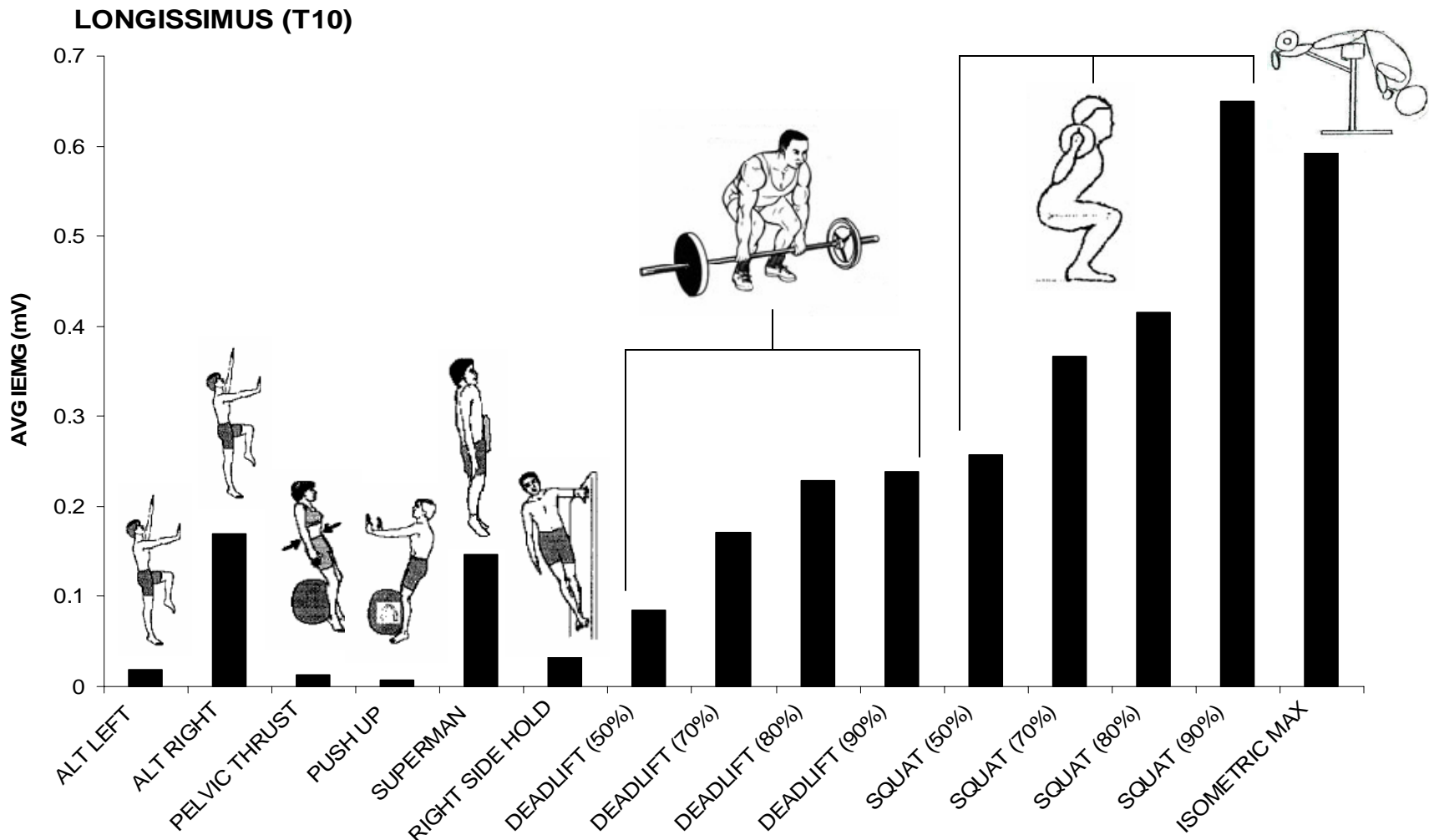
Neuromuscular Laboratory

# New Training Techniques

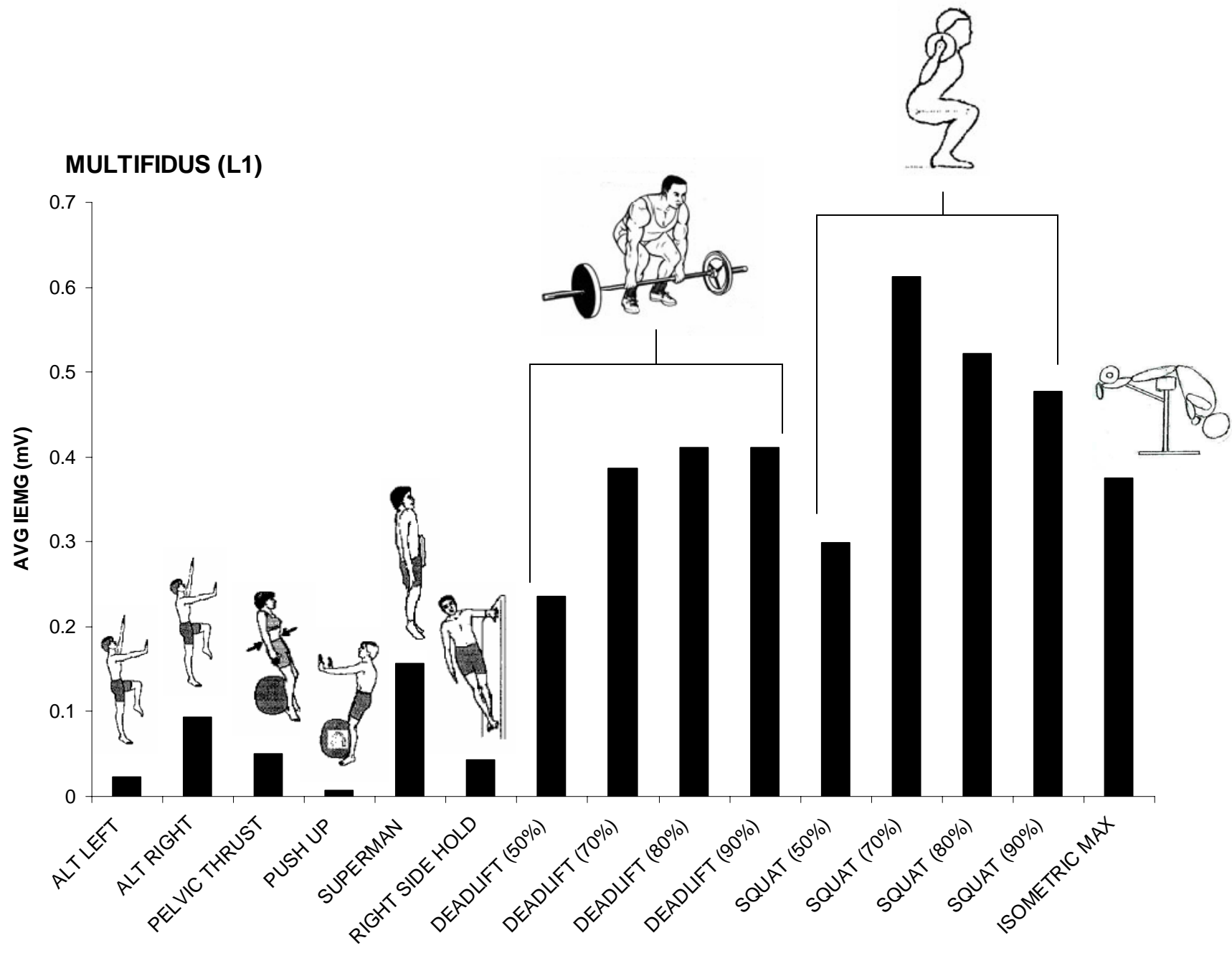
Jeffrey M. McBride, PhD  
Associate Professor – Biomechanics  
Department of Health, Leisure & Exercise Science  
Appalachian State University

# Focus on Core & Stability

- Activation of Trunk Muscles (Exercise Selection)

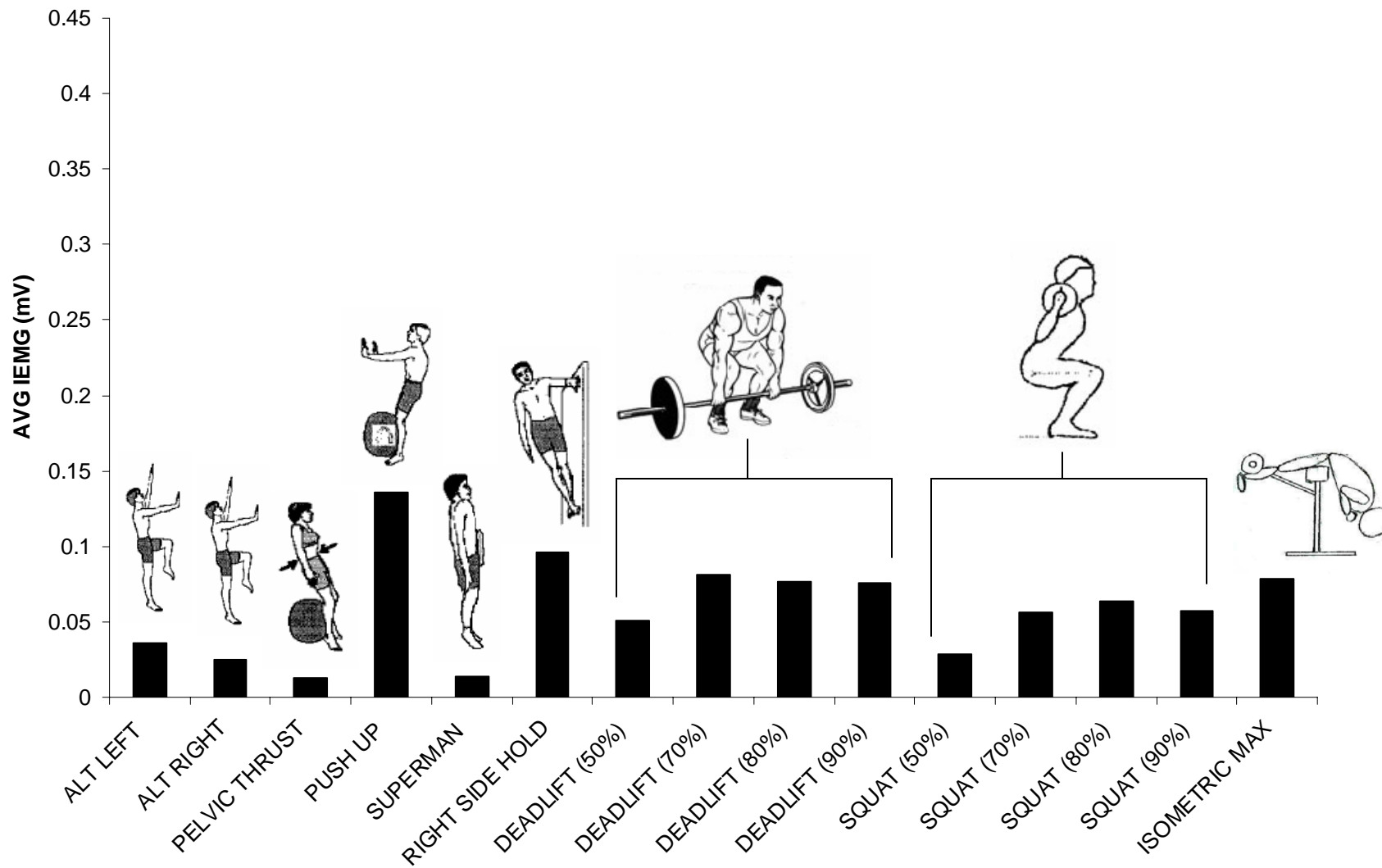


(Unpublished McBride et al. 2006)



(Unpublished McBride et al. 2006)

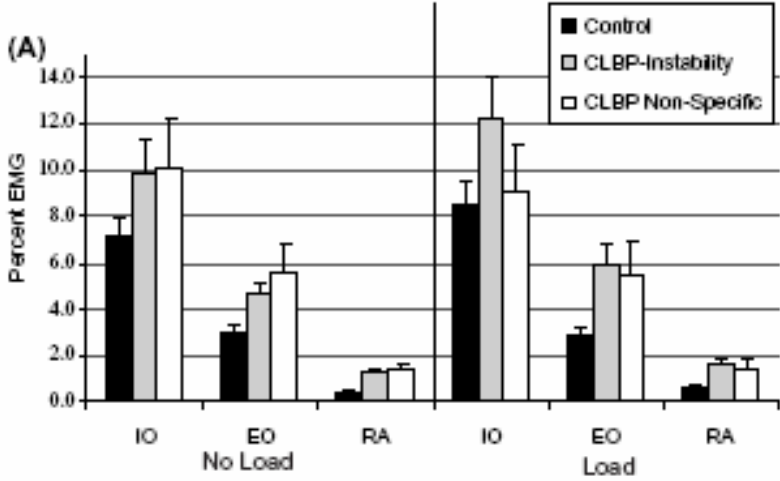
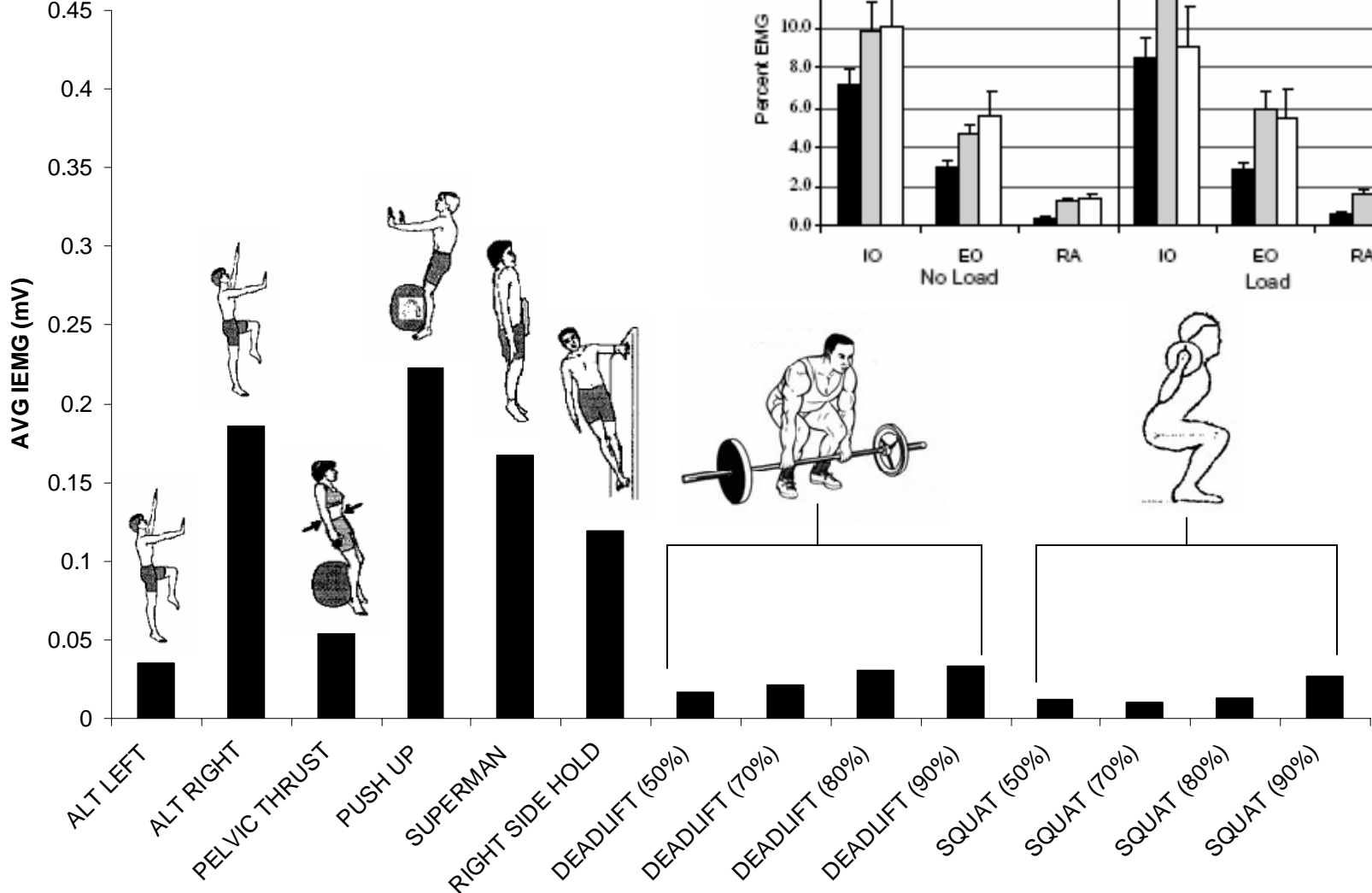
## EXTERNAL OBLIQUES



(Unpublished McBride et al. 2006)

(Silfies et al. 2005)

**RECTUS ABDOMINIS**



(Unpublished McBride et al. 2006)

# Focus on Core & Stability

- Relationship to Athletic Performance

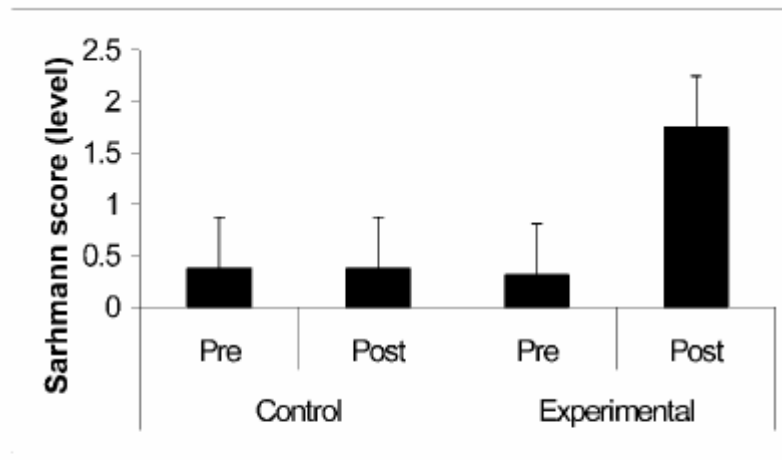


FIGURE 1. Sahrman test of core stability data for the control and experimental groups before and after 6 weeks of Swiss ball training (\* = result significantly different from control group posttraining result [ $p < 0.05$ ]; # = result significantly different from experimental group pretraining result [ $p < 0.05$ ]).

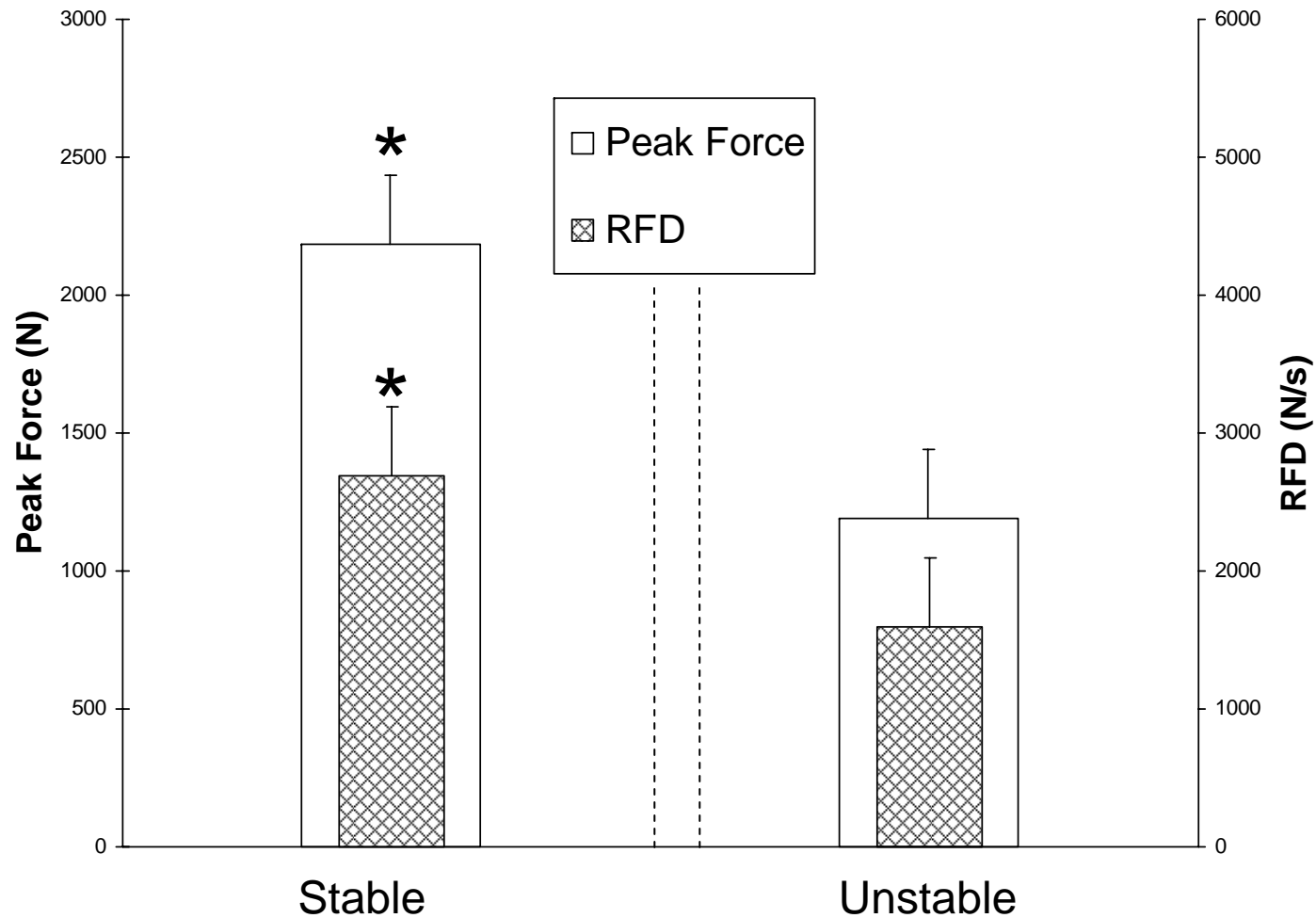
No change in Muscle Activity of RA, EO or ES

No change in  $VO_2$  at select running velocities

(Stanton et al. 2004)

# Focus on Core & Stability

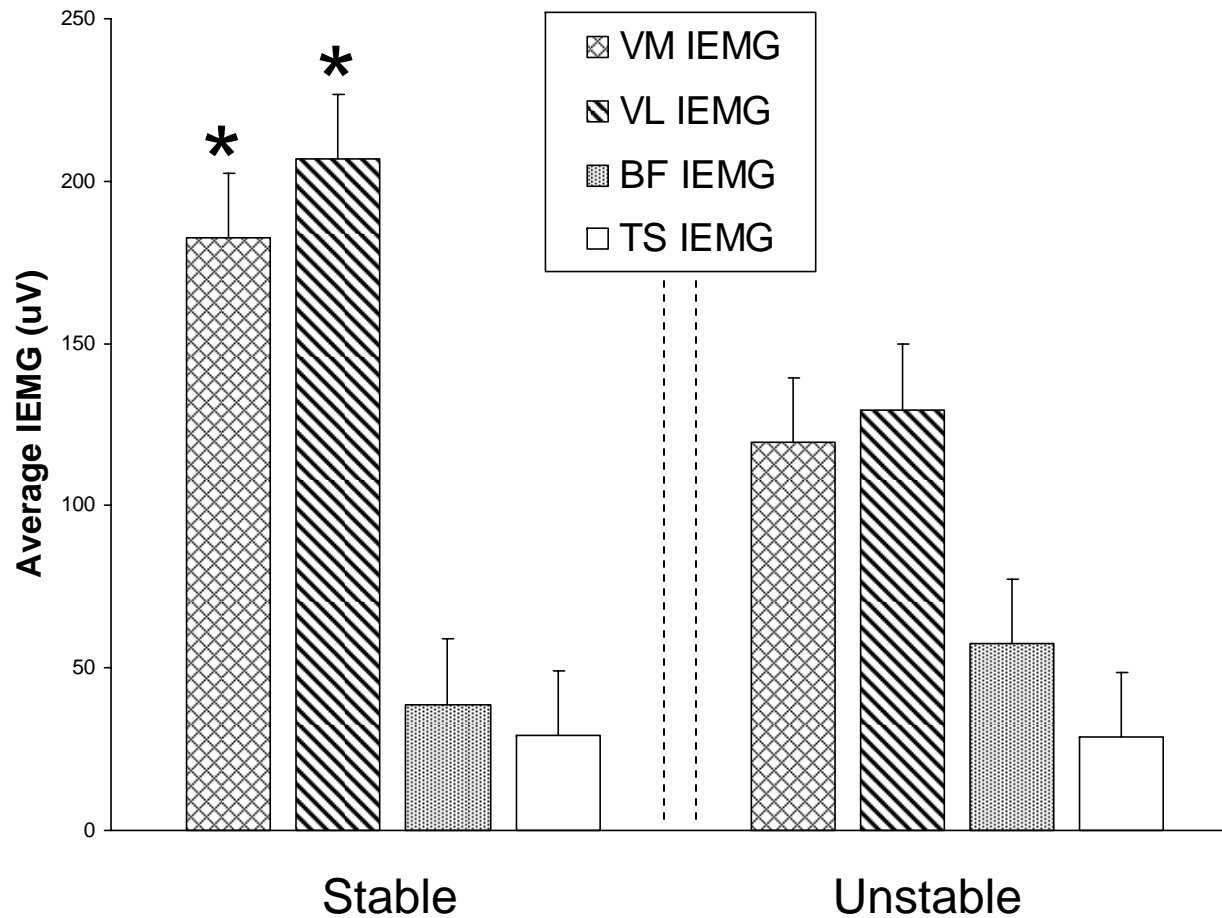
- Muscle Activity and Stability in Squatting



(McBride et al. 2006)

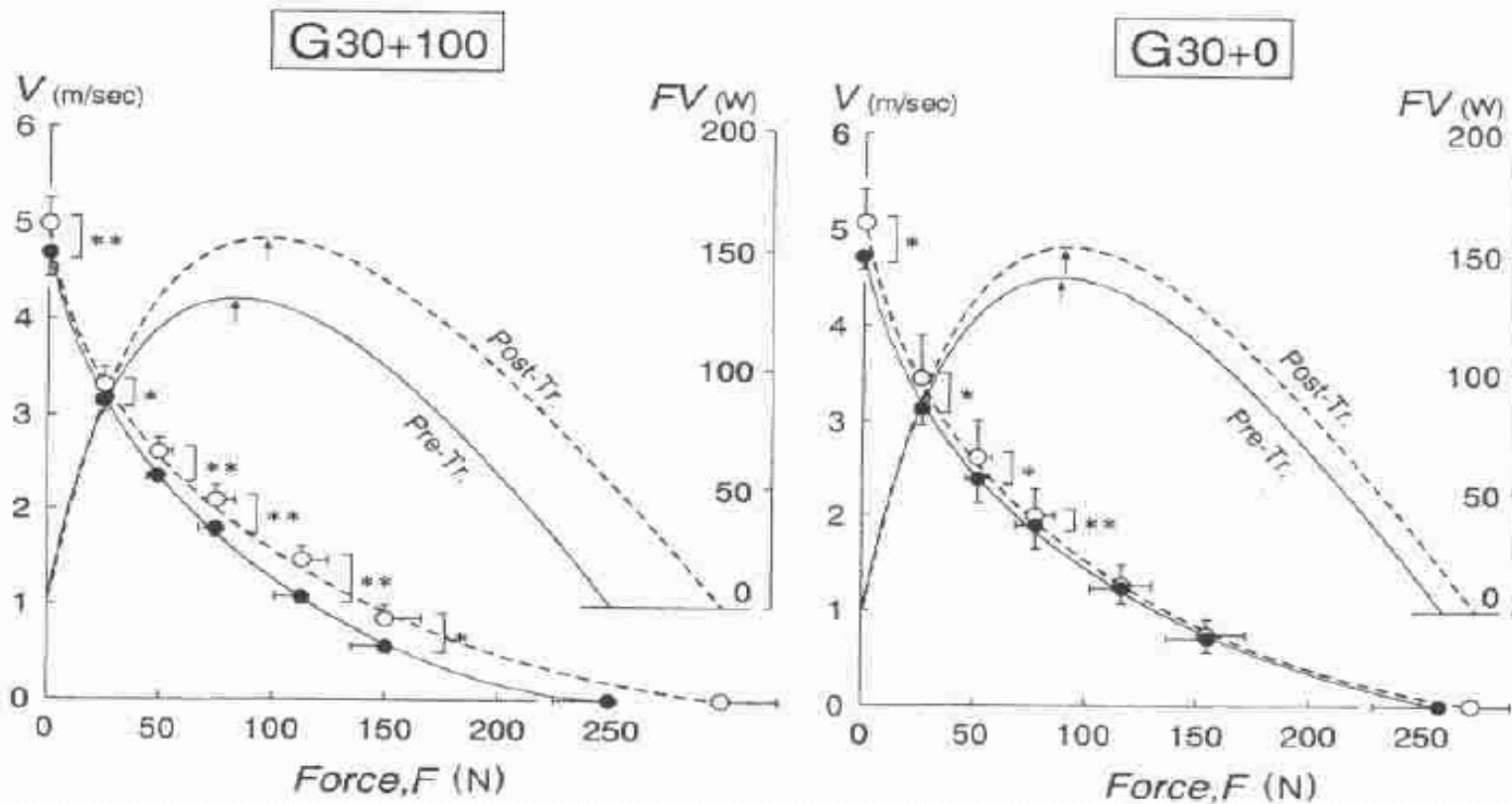
# Focus on Core & Stability

- Muscle Activity and Stability in Squatting



(McBride et al. 2006)

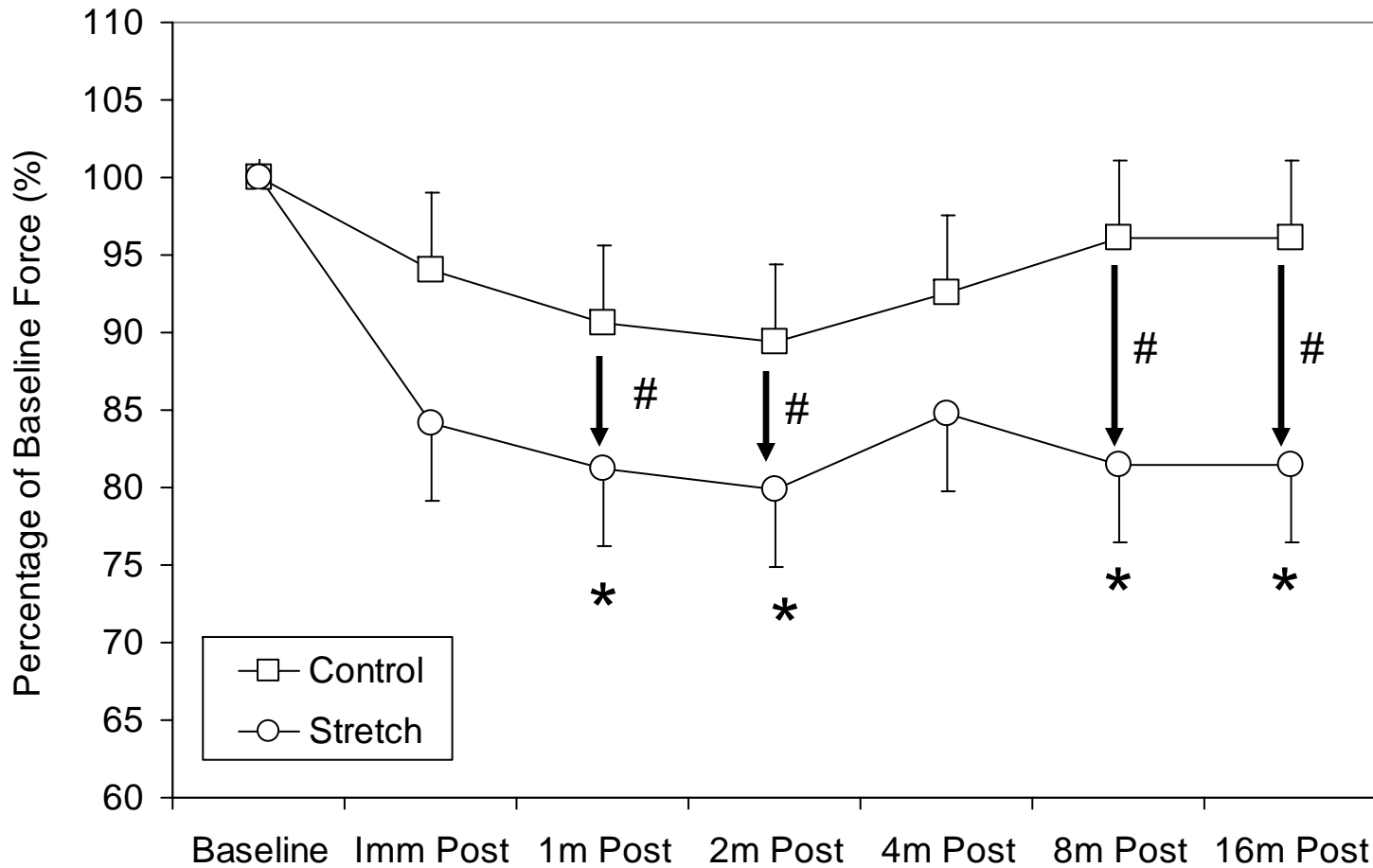
# Emphasis on Power



**Figure 2.** Force–velocity and force–power relations at pre- and posttraining periods in two different training groups. Arrow indicates load at which maximum power appeared. \*Significant difference between pre- and posttraining ( $p < .05$ ). \*\* Significant difference between pre- and posttraining ( $p < .01$ ).

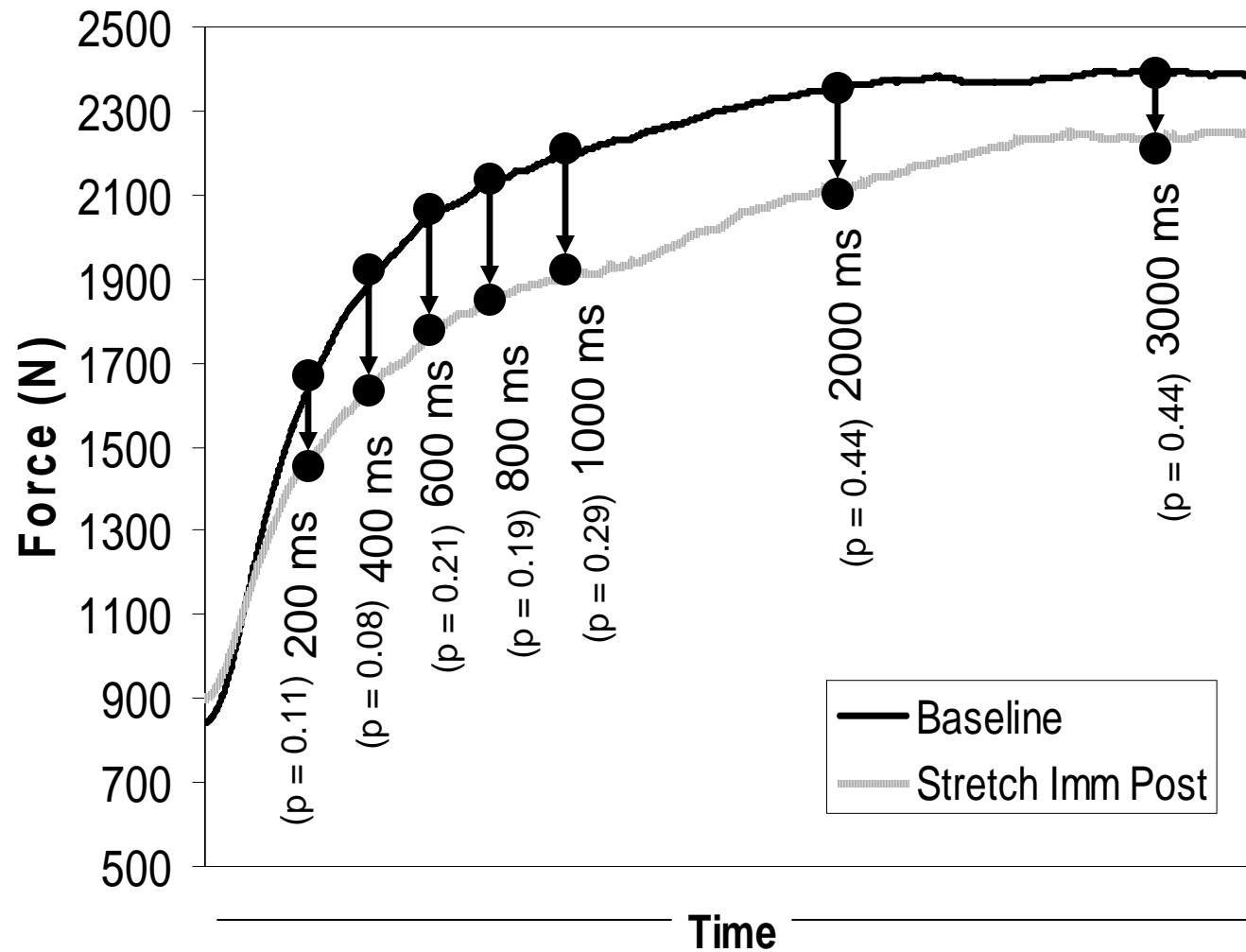
(Kaneko et al. 2004)

# Re-Evaluation of Stretching



(McBride et al. 2006 )

# Re-Evaluation of Stretching



(McBride et al. 2006 )

# Conclusion

- Consider Exercise Selection for Muscle Activation
- Consider Impact of Instability on Muscle Activation
- Consider Training for Strength or Power
- Consider Effect of Stretching on Muscle Force