Neurocognitive and Psychological Health Treatment Strategies

Stretching Negatively Affects Locomotor Recovery in Animal Models of Spinal Cord Injury

In current clinical practice, physical therapists commonly use stretching as an approach to avoid post-spinal cord injury (SCI) contractures and to maintain the extensibility of soft tissues. Extending their previous paradigm-shifting work in a mild contusion thoracic SCI rat model, researchers at the University of Louisville (Louisville, Kentucky), demonstrated a negative effect of stretching on locomotor recovery in a moderately severe contusive SCI model, which is more clinically relevant (*Caudle et al. 2011, Keller, Rees, et al. 2017, Keller, Wainwright, et al. 2017*). They showed that daily static stretching, whether initiated acutely (five days after injury) or chronically (10 weeks after injury), resulted in significant locomotor impairment (*Keller, Wainwright, et al. 2017*; Figure 1). Similar negative effects were observed for dynamic "Range of Motion" stretching, a commonly used alternative to static stretching in physical therapy (*Keller, Rees, et al. 2017*). Locomotor function recovered to control levels within two weeks after daily stretching ceased. The negative effect of stretching is not associated with signs of muscle damage. Taken together, these results suggest that stretching as a therapy can potentially hinder aspects of locomotor recovery. These findings could lead to changes in current physical therapy practice and improve the outcome of rehabilitative care for Service members with SCI.

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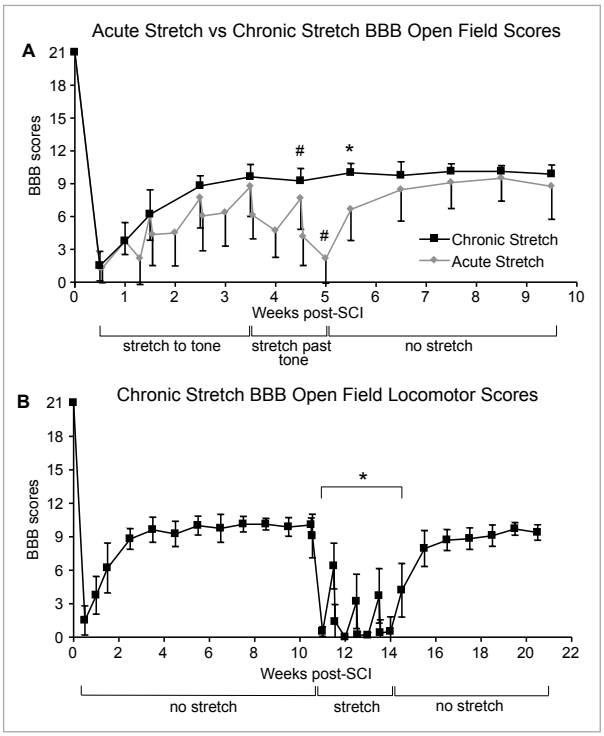

FIGURE 104: Acute and chronic Basso, Beattie, and Bresnahan Open Field Locomotor Scores. (A) Basso, Beattie, and Bresnahan scores are shown for the acute and chronic (ChS) stretch groups over the first 10 weeks post-injury. Drops in Basso, Beattie, and Bresnahan scores were modest and not significant during the first 4 weeks but became significant at 5 weeks after higher perceived forces were applied starting at week 4. #Indicates significant differences between Monday morning and Friday afternoon Basso, Beattie, and Bresnahan scores. *Indicates significant differences in Basso, Beattie, and Bresnahan scores for stretched and unstretched groups. (B) Basso, Beattie, and Bresnahan scores of the ChS group dropped dramatically after only 1 week of stretching. *Indicates significant differences between pre-stretch (week 10 Monday morning) and stretch Basso, Beattie, and Bresnahan scores. SCI, spinal cord injury. (Figure from Keller, Wainwright, et al. (2017) used with permission from the authors)

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