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Our lab has conducted a preliminary investigation into the potential mechanical benefit of using a SureSquat passive elastic device during submaximal back squatting. Participants performed a series of squats (body weight, 50% of their estimated 5RM, 100% of their estimated 5RM) while wearing the SureSquat device and without the device. The study included a wide range of collegiate aged adults, with and without lifting experience.

While performing all tasks, muscle activation and motion capture data was captured to identify biomechanical difference between the two conditions. Follow-up questions were asked of all participants gauging their feelings about the device.

#### Initial findings:

- Increased muscle activation across conditions of the adductor muscle group.
- Slight reduction in erector spinae muscle activation (lower back) during the eccentric phase of the squat.
- Knee abduction (valgus) was shown during the eccentric loading phase of the squat for only the body weight condition. No other knee frontal plane differences were observed.
- There were no differences reported in sagittal plane motion across all conditions.

#### Interpretations:

- **Enhanced proprioceptive feedback** by the SureSquat system may have led to the increase in Adductor muscle activation. This coupled with the decreased variability of the population in frontal plane movement patterns at the knee may have created a more constrained position of across the study population.
- **Maintenance of sagittal plane** patterns demonstrate lack of interference with the skill and technique, while influencing frontal plane motion and muscle activation to potentially enhance performance and rehabilitation capacity. While optimization was not measured, maintenance of sagittal plane performance is required to maximize both ergonomics and overload principals.

#### Participant Quotes:

*'I fell this device would assist with recovery.'*

*'[It] felt supportive in the bottom position of the squat.'*

*'The device helped a lot with my knees during [the] squat. It kept my knees from dipping in.'*

*'[I] haven't used something like this before, so it was a new experience. I felt more secure and capable somehow but I wouldn't want to wear the device for long periods of time.'*

*'I felt as though it actually made doing the lifts easier and kept me in the correct position.'*

*'I thought it was helpful to have that extra proprioception and feeling of support.'*

A handwritten signature in black ink, appearing to be 'JB' with a stylized flourish.