

The rich research potential of the Core-flex design

The dynamic sitting promoted by the use of the split Core-flex seatpan paves the way for new research. Potential research opportunities that exist include research protocols to:

- 1) Investigate whether those with NSCLBP who consciously use lateral sway to gain relief from their pain in standing, also gain relief using the lateral sway inducing mechanism of the Core-flex chair.
- 2) Measure using a wireless posture monitor, the degree of pelvic obliquity and lateral flexion that occurs with use of the Core-flex seat with subjects sitting in their neutral lumbar spine posture.
- 3) Compare the degree of pelvic obliquity and lateral flexion that subjects can achieve using the Core-flex mechanism with the spine in maximal slouch, maximal lordosis and neutral.
- 4) Investigate the effect that use of the Core-flex seatpan has on the superficial core muscles using surface EMG in both those with and without a history of NSCLBP
- 5) Investigate the effect that use of the Core-flex seatpan has on transversus abdominis and deep multifidus. It may be possible to track transversus abdominis contraction using Rehabilitative Ultrasound Imaging. Tracking deep multifidus will require fine wire EMG.
- 6) Investigate the effect that use of the Core-flex seatpan has on psoas major and quadratus lumborum and their ability to simultaneously flex the hip and laterally flex the spine respectively, while maintaining lordosis. Such studies require fine wire EMG.
- 7) Determine whether use of the Core-flex split system mechanism expends sufficient METS to be classified as light intensity activity.
- 8) Compare leg volume changes when using the Core-flex leg driven seatpan motion with the chair used by Strandén [65] where the seatpan tilt forced a reaction from the legs.
- 9) Compare the effect of ankle plantarflexion on venous velocity and return with the findings of Stein [64] who used dorsiflexion.
- 10) Determine how effective the alternating pelvic obliquity is on alternating pressure between the ischial tuberosities.
- 11) Determine whether buttock pressure is less than 50mmHg described by Noro et al. [33] as the “sitting buttock comfort zone”.
- 12) Determine how much pressure is transferred to the thighs from the ischial tuberosities by the geometry of the seatpan.