

NO.  
01  
2015



*Science & News*

**Kim ER et al.** Effect of Vibration Frequency on Serratus Anterior Muscle Activity during Performance of the Push-up Plus with a Redcord Sling.  
*Journal of Physical Therapy Science* 2014;26(8):1275-6.

**Summary:** This study concludes that adding vibration at a frequency of 50 Hz is effective in enhancing muscle activity in serratus anterior when performing the push-up plus exercise.

**Abstract:** PURPOSE: We investigated the effect of vibration at various frequencies on serratus anterior (SA) muscle activity.

SUBJECTS: Ten male subjects were recruited.

METHODS: The subjects performed the push-up plus exercise supported by straps above the surface and vertical ropes in the Redcord sling. During the push-up plus, vibrations of 0, 30, 50, or 90 Hz were applied to the Redcord sling using a mechanical vibration apparatus attached to the rope. SA muscle activity was recorded using electromyography.

RESULTS: SA muscle activity at the 50 Hz vibration frequency was significantly higher than that of no vibration.

CONCLUSION: Performing the push-up plus using a Redcord sling with mechanical vibration of 50 Hz effectively increased SA muscle activity.

**Park J et al.** The effects of a bridge exercise with vibration training and an unstable base of support on lumbar stabilization.  
*Journal of Physical Therapy Science* 2015;27(1):63-5

**Summary:** When the purpose of bridging exercises performed in slings is to increase muscle activity in both local and global muscles this study indicates that adding vibration to the exercises is advantageous.

**Abstract.** PURPOSE: The aim of this study was to examine the effects of a bridge exercise with vibration training and an unstable base of support on lumbar stabilization.

SUBJECTS: This study assigned healthy adults in their 20s to a bridge exercise with a sling and vibration group (BESV, n=20) and a bridge exercise with a sling group (BESG, n=20).

METHODS: Electromyography was used to comparatively analyze the activity of the internal obliques (IO), external obliques (EO), and rectus abdominis (RA) when local vibration was applied during a bridge exercise that used a sling as an unstable base of support.

RESULTS: There were statistically significant increases in the activity of the IO and EO within each group after the intervention. The activity of the IO and the EO was significantly higher in the BESV group than in the BES group after the intervention.

CONCLUSION: The bridge exercise performed using vibration training on an unstable base of support increased the activity of the IO and the EO, which improved lumbar stabilization.

**Yun K et al.** Effects of closed chain exercises for the lumbar region performed with local vibration applied to an unstable support surface on the thickness and length of the transverse abdominis.

Journal of Physical Therapy Science 2015;27(1):101-3

**Summary:** This measurement study shows that adding vibration to bridging exercises performed in slings is effective at increasing activity of transverse abdominis.

**Abstract.** PURPOSE: This study examined the effects of closed chain exercises performed with local vibration applied to an unstable support surface on the thickness and length of the transverse abdominis.

SUBJECTS: The subjects were 64 healthy university students who were randomly assigned to a bridge exercise with sling and vibration group (BESVG, n=30) and a bridge exercise with sling group (BESG, n=34).

METHODS: The bridge exercise was repeated four times per set and a total of 18 sets were performed: 9 sets in a supine position and 9 sets in a prone position. In both the BESVG and the BESG groups, the thickness and length of the transverse abdominis (TrA) were measured using ultrasonography with the abdomen "drawn-in" and the pressure of a biofeedback unit maintained at 40 mmHg, both before and after the intervention.

RESULTS: In intra-group comparisons, the BESVG showed significant increases in the thickness of the TrA and significant decreases in the length of the TrA. The BESG showed significant increases in the thickness of the TrA. The BESVG showed significant increases in the thickness of the TrA and significant decreases in the length of the TrA compared to BESG.

CONCLUSION: Closed chain exercises for the lumbar region performed with local vibration applied to slings, which are unstable support surfaces, are an effective intervention for altering the thickness and length of the TrA.

**Barton JB et al.** The 'Best Practice Guide to Conservative Management of Patellofemoral Pain': incorporating level 1 evidence with expert clinical reasoning.

British Journal of Sports Medicine 2015;0:1-13

**Summary:** The present study concludes that the best practice in the management of PFP is an individually tailored multimodal intervention program. This includes gluteal and quadriceps strengthening, patellar taping and an emphasis on education and activity modification.

**Abstract:** IMPORTANCE: Patellofemoral pain (PFP) is both chronic and prevalent; it has complex aetiology and many conservative treatment options.

OBJECTIVE: Develop a comprehensive contemporary guide to conservative management of PFP outlining key considerations for clinicians to follow.

DESIGN: Mixed methods.

METHODS: We synthesised the findings from six highquality systematic reviews to September 2013 with the opinions of 17 experts obtained via semistructured interviews. Experts had at least 5 years clinical experience with PFP as a specialist focus, were actively involved in PFP research and contributed to specialist international meetings. The interviews covered clinical reasoning, perception of current evidence and research priorities.

**RESULTS:** Multimodal intervention including exercise to strengthen the gluteal and quadriceps musculature, manual therapy and taping possessed the strongest evidence.

Evidence also supports use of foot orthoses and acupuncture. Interview transcript analysis identified 23 themes and 58 subthemes. Four key over-arching principles to ensure effective management included—(1) PFP is a multifactorial condition requiring an individually tailored

multimodal approach. (2) Immediate pain relief should be a priority to gain patient trust.

(3) Patient empowerment by emphasising active over passive interventions is important.

(4) Good patient education and activity modification is essential. Future research priorities include identifying risk factors, testing effective prevention, developing education strategies, evaluating the influence of psychosocial factors on treatment outcomes and how to address them, evaluating the efficacy of movement pattern retraining and improving clinicians' assessment skills to facilitate optimal individual prescription.

**CONCLUSIONS AND RELEVANCE:** Effective management of PFP requires consideration of a number of proven conservative interventions. An individually tailored multimodal intervention programme including gluteal and quadriceps strengthening, patellar taping and an emphasis on education and activity modification should be prescribed for patients with PFP. We provide a 'Best Practice Guide to Conservative Management of Patellofemoral Pain' outlining key considerations.



We have now launched Redcord Stimula+, a new and improved model with even more options

#### Benefits of the new features



#### Muscle activation

Vibration may enhance muscle activation and is documented most efficient in the frequency range between 30-50 Hz. Redcord Stimula+ can now offer this range of vibration frequencies with all energy levels.

#### Pain management

Modulation of pain is proven effective with higher levels of vibration frequencies. Redcord Stimula+ has a wider range of higher frequencies with different energy levels. This gives the therapist more and better options in pain management.

#### Random vibration mode

The neuromuscular system can over time adapt to proprioceptive input, such as vibration. This may result in decreased effect of vibratory stimulation. A random vibration mode with varying and unpredictable vibration patterns will reduce the likelihood of the neuromuscular system getting accustomed to a certain vibration frequency. Redcord Stimula+ has several programs and options for applying random vibration with different energy levels and different frequency ranges.