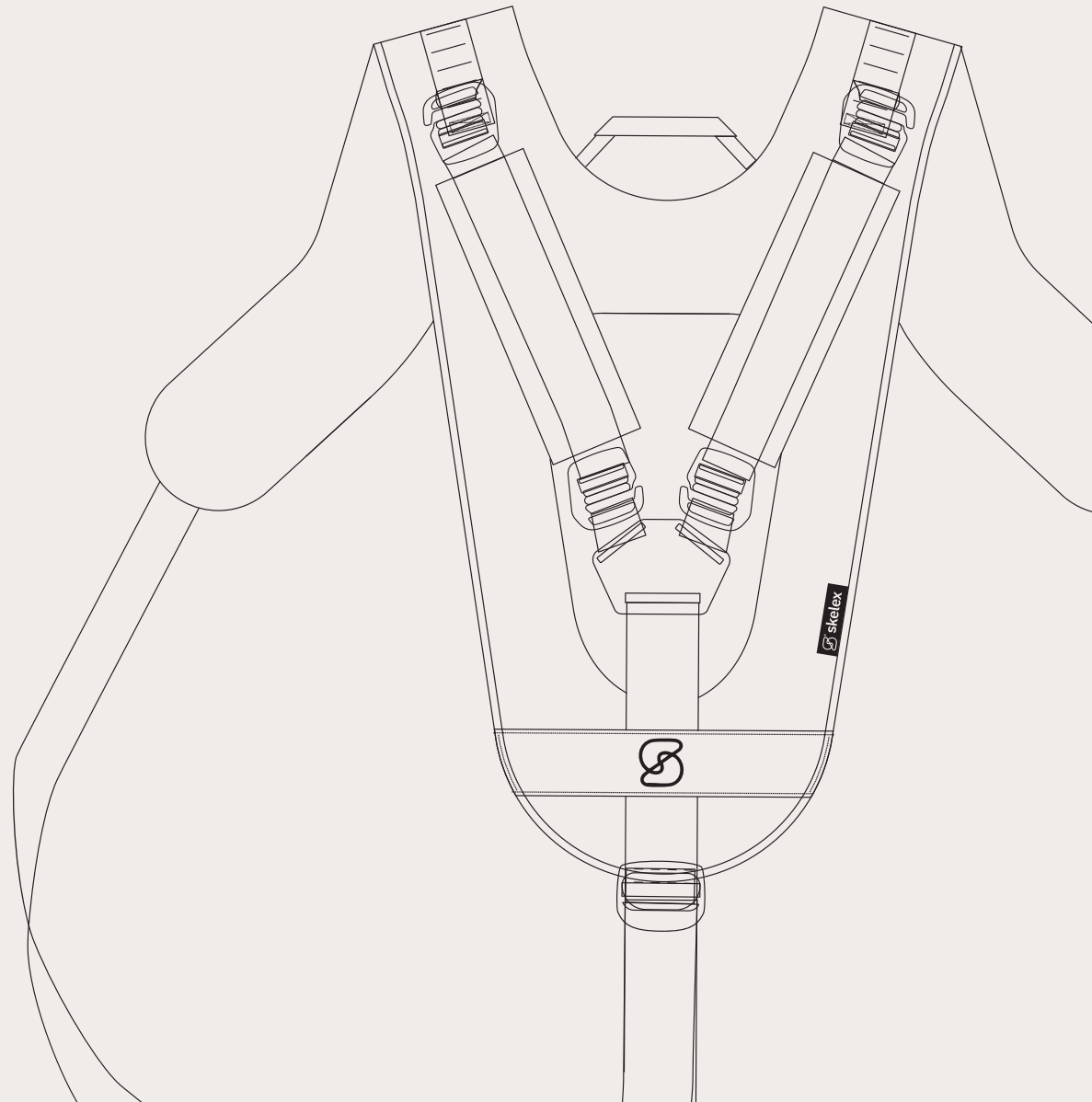
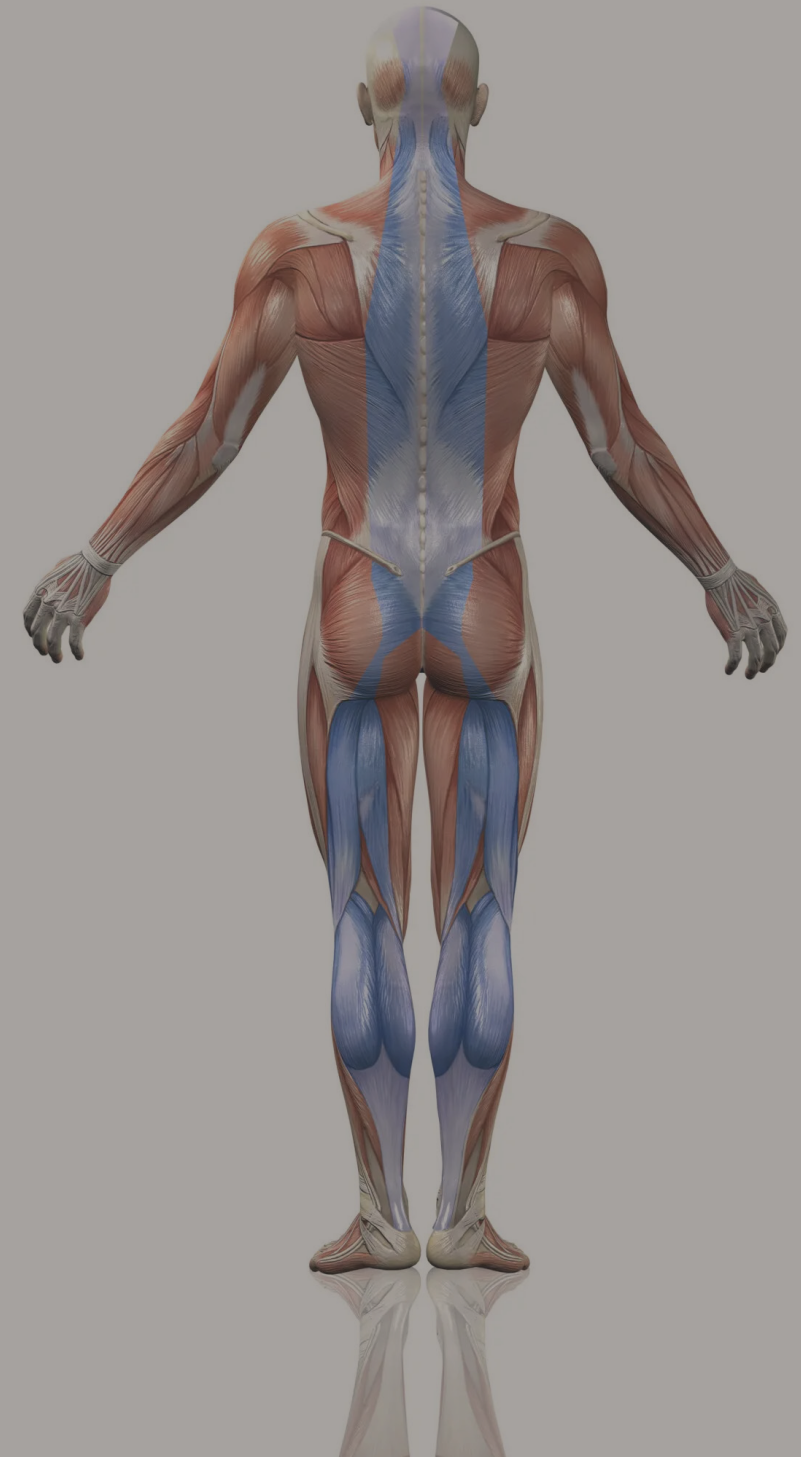


Skelex **Edge**

100%
backed
by science



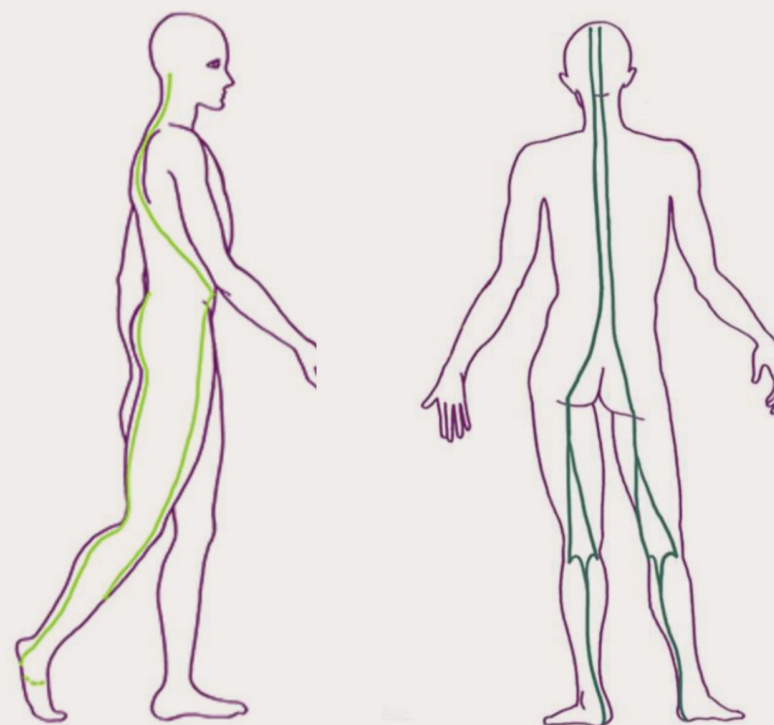
Skelex Edge is inspired by examining the myofascial lines in the body, adding external 'muscles' along these lines to make you stronger.



The concept

The Skelex Edge uses positive reinforcement to encourage “lifting with your legs.” It does this by providing more assistance in this style of lift than with stooping. The Skelex Edge was inspired by examining the myofascial lines in the body, Fig 1. The myofascial lines are lines of connective tissue that run throughout the body to help the body move as a unit. By adding elastic parallel to and joining the myofascial lines, we can be more optimized for bending and lifting tasks. These elastic bands store potential energy during the squat motion and return it during the lift. This means that the Skelex Edge assists with the lift, as opposed to only rerouting the loads to other parts of the body. There is evidence that this approach lowers back muscle activation [1].

The Skelex Edge is currently the only device that offers the possibility to anchor force around the knee as well as on the thighs. Anchors around the knee provide additional strength to the quadriceps. Lack of quadricep strength is one of the primary reasons that people perform a stoop lift versus a squat lift [2]. This is problematic because stoop lifting is more injury prone than squat lifting. In a stoop lift, the compressive loads on the spine are nearly the same as in a squat lift, however, the shear loading on the lower back is doubled. Anchors around the thighs also have advantages for forward bending tasks or when it is inconvenient to have anchors around the knees.



*Fig 1.
Spiral (left) and superficial dorsal (right) myofascial lines; elastics stretched along the spiral lines stabilize imbalance through the body and along the superficial dorsal lines help with posture.*

Benefits

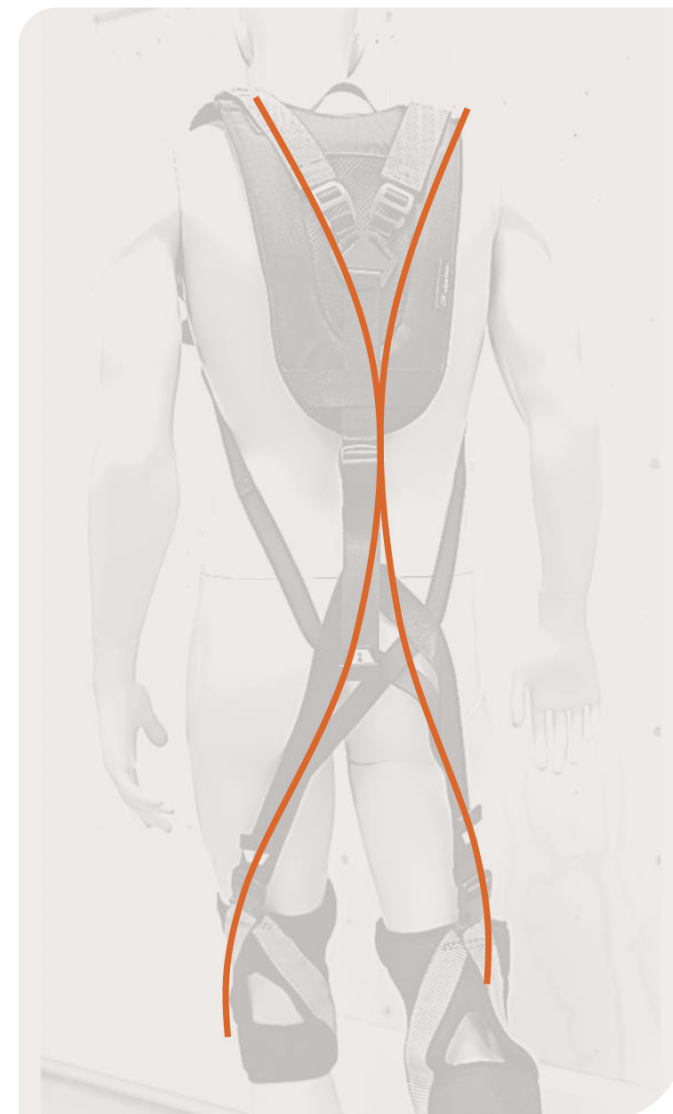
Skelex Edge was inspired by examining the myofascial lines in the body, adding external 'muscles' along these lines to make you stronger.

The human body is optimized for some tasks and suboptimal for others. For example, walking and running are energetic activities, yet we are able to walk and run for long periods of time. Lifting and bending are similar in energy to walking and running, however it is difficult to perform these tasks for long periods of time and injuries are common, known as Musculoskeletal Disorders or MSDs. One of the reasons for this is that our skeletons, muscles, tendons, and fascia are optimized for walking and running but not bending and lifting.

The Skelex Edge adds an elastic energy storing element parallel to the muscles and tendons of the back and legs. The elastic is routed so that it connects the myofascial front and back lines to alter the optimization

of the body for bending and lifting with the legs and the back. As a result,

- users naturally adopt a safe posture for lifting (squat lifting) because it feels more natural than a dangerous rounded back (scoop lifting)
- users lift with their legs because it feels better to kneel into the Skelex Edge creating support from the lower elastics around the knee
- parallel routing of the elastic lowers muscle activation of the back and legs while also reducing metabolic cost; i.e. reduces muscle fatigue and overall energy expenditure



Muscle activation data

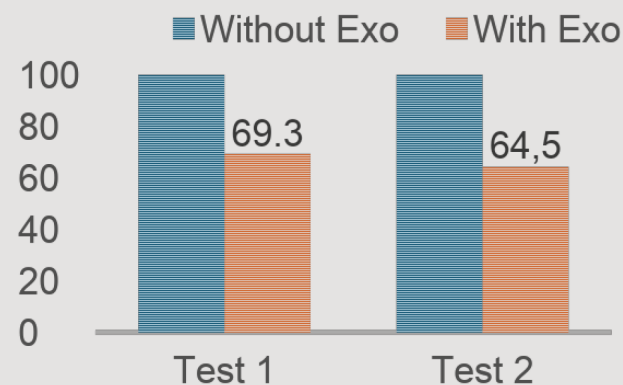
A reduction of more than 30% was observed in muscle activity around the lumbar region based on EMG data

Muscle activity is an indicator of the effort required for performing a task, commonly measured with Electromyography or EMG [3]. EMG Data collected with a Noraxon DTS EMG system showed reduced muscle activation in the lower back of a user for a variety of experiments. Reductions in erector spinae, gluteus maximus, bicep femoris, and semitendinosus EMG almost across the board resulted from wearing the Skelex Edge, as shown in the adjacent Fig 2.

Test 1 involved bending and lifting a beam of ~ 25 lb from the floor. The user performed 5 lifts in sequence of the 25lb load with and without assistance. Test 2 involved maintaining a bent over position holding a tool. The user performed a 30 second bend while holding a shovel with and without Skelex Edge assistance. Around 30 % reduction of mean muscle activity in the lumbar region was observed for Test 1 and around 35% of Test 2. EMG data demonstrates the effectiveness of the Skelex Edge.



Fig 2 c) Results : % reduction of mean muscle showing a reduction of ~30% in Test 1 and ~35% for Test 2



Metabolic cost

More than 10% reduction in metabolic cost was observed while using the Skelex Edge, which means your body works less for the same task

From a metabolic cost perspective, most users tend to 'scoop lift' because it costs less energy, even though the loads on the lower vertebrae are substantially higher; in other words, it feels lighter in the short term, but negatively impacts the body in the longer term leading to MSDs. Back related MSDs are one of the leading causes of workplace absence [4]. As Skelex Edge promotes 'squat lift', metabolic cost was measured to evaluate if the body has to work harder to lower the muscle activity as measured earlier, in order to reduce the risk of back related MSDs.

Data collection of metabolic cost was performed on 2 subjects using a Cosmed Metabolic Unit to measure steady state oxygen consumption for a squatting task. The subjects would squat down to sit on a low chair (without arm rests) and then stand back up in time with a metronome. A 10%–15% Reduction in metabolic cost was observed while wearing the Skelex Edge for this task as compared to the no-assistance condition (Baseline).

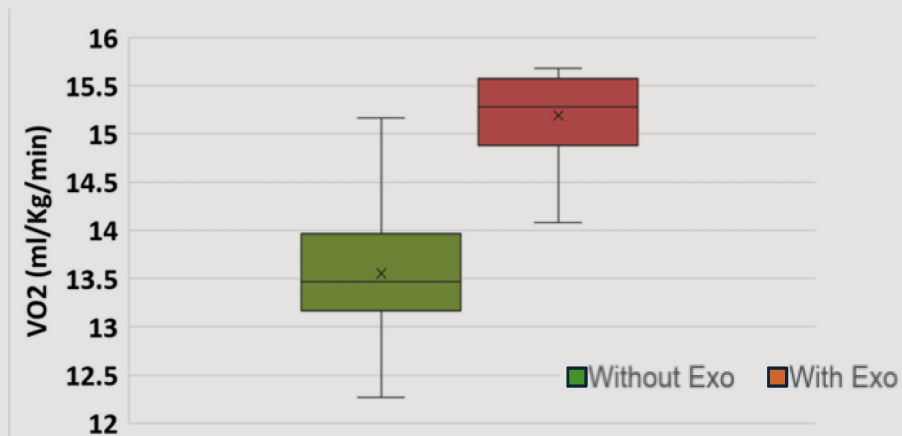


Fig 3:
Metabolic performance for a squatting task with and without wearing the Skelex Edge. Statistically significant reduction of metabolic cost was observed while wearing Skelex Edge (in green) compared to baseline (in red).



Skelex **Edge**

Your back
will **love**
you for it.



Scan the QR code for
more information about
the Skelex Edge.



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