



# **STOKO K1**

## **COMFORT AND COMPLIANCE**

*Stoko Design Inc.*

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The purpose of this document is to provide an overview into the benefits of comfort and compliance of the Stoko K1.

## Comfort and Compliance

There are many benefits to wearing a knee brace; reduced chance of injury in specific sports (1-4), reduced loads on the anterior cruciate ligament and medial collateral ligament (5,6), decreased anterior tibial translation in anterior cruciate ligament deficient knees (7), a sense of security and improved confidence (8,9), and reduced pain (10). However, all these benefits require the athletes to wear the brace; in other words, they must have high compliance. Unfortunately, compliance with prolonged usage of knee braces may be as low as 20%-25% for some applications (11,12). A primary culprit of low compliance is discomfort (11). If the brace is uncomfortable the patient is not going to be inclined to use the device.

*“The high percentage of patients who are not wearing the prescribed orthotic devices lead to a high financial loss for society and a waste of therapeutic effort.”(11)*

Designing a comfortable knee brace is a pillar of Stoko’s philosophy. We paid close attention to all aspects of comfort and it was constantly analyzed during device testing. During beta testing we gathered testers who were skiing, running, hiking, and biking who have previously used knee braces. These participants were asked to compare the comfort of the Stoko K1 with their current device while performing their activity. The results were overwhelming.

*87% of Testers Agreed –Stoko K1 was more comfortable than their current device*

These results cannot be understated. 87% of our testers thought our device was more comfortable than their current knee support device. The K1 achieved this while providing support similar to a leading traditional rigid brace [[Stoko K1 Support Verification](#)]. This will lead to higher compliance while wearing Stoko’s K1 compared to a traditional rigid brace.

This document takes a deeper dive into comfort and how the Stoko K1 improves upon traditional rigid braces.

## Size and Weight

*Traditional Rigid Brace:* Rigid braces are big, thick, and heavy. They are so cumbersome that they have been shown to increase, blood lactate levels, oxygen consumption, and heart rate (13,14). In short, the added weight makes athletes consume more energy (14). Additionally, the strapping tension required to hold up these heavy devices is associated with premature muscular fatigue (15).

*Traditional rigid braces are so cumbersome that they have been shown to increase, blood lactate levels, oxygen consumption, and heart rate*

*Stoko K1:* The Stoko K1 is thin and lightweight. The device is 13X thinner and 33% lighter than our benchmark competition [[Stoko - how we stack up](#)]. This means Stoko will allow athletes to better reach their full performance potential. The K1 is ideal for patients who need to wear the device under other garments.

## Migration

*Traditional Rigid Brace:* Brace migration simply means that the brace is falling down the leg from its intended position. Brace migration is frequently cited as a primary complaint from knee brace patients (16,17). Patients must stop their activity to pull the knee brace up, retighten, or realign. Failure to do so can lead to discomfort, improper knee mechanics, and failure to provide adequate protection to the knee. The natural anatomy of the leg is in conflict with a traditional rigid brace and encourages brace migration. The thigh tapers down as it approaches the knee forcing straps downwards.

*Stoko K1:* The Stoko K1 does not have the same migration issues as a traditional rigid brace. In fact – from our pilot testing, none of our athletes experienced downwards migration of the tights. This is due to the tights having a natural anchor point at the hip but is a clear win over traditional rigid bracing. Stoko K1 users can be confident that they will not need to continuously stop their activity to compensate for brace migration

*0% of our testers experienced brace migration*

## Knee Anatomy

*Traditional Rigid Brace:* Rigid braces have a thigh and calf shell connected with a hinge. The geometry of the hinge dictates how the two halves of the brace rotate with respect to each other. Unfortunately, the human knee is not a hinge. Every body has unique geometry which will not align with the geometry of the rigid brace's hinge. This mismatch can cause brace pistoning (18) and alter lower limb kinematics if placed incorrectly (19).

*Stoko K1:* The Stoko K1 does not have a hinge. The cables are integrated directly into the tight and will conform to the body throughout its range of motion. This provides a natural feel and support for any athlete.

## Pressure

*Traditional Rigid Brace:* Rigid braces are either constructed out of carbon fiber or aluminum. Their rigidity allows them to support and stabilize the leg. To fit an athlete's anatomy, the brace will either be custom fit to a mold of the anatomy (expensive) or must be bent into position using bending irons. It can be difficult for practitioners to manipulate the brace perfectly to the patient's anatomy. A wide range of patient anatomies in the gastrocnemius (calf) and vastus medialis oblique (thigh) can be particularly difficult to accommodate in the brace shape. Furthermore, incorrect frontal plane (valgus and varus) alignment of the frame will create pressure on the medial or lateral condyle pads due to Q angle alignment which can typically change as much as 12 degrees between patients (20).

*Stoko K1:* The Stoko K1 conforms to your anatomy. The cabling system flows naturally throughout the device and will adapt to your body. This means that our tight does not need adjustment for different body types. No bending irons needed; no molds taken. The Stoko K1 is a great fit right out of the box. See our overview of the [Embrace System™](#) for more information about how the Stoko K1 provides support without the need for a rigid structure.

*No bending irons needed; no molds taken.  
The Stoko K1 is a great fit right out of the  
box.*

## Washability

*Traditional Rigid Brace:* Keeping your gear clean and free of sweat and bacteria is important for your long-term skin health and biocompatibility (21). With traditional rigid braces, you must disconnect 2 liners, 2 condyle pads, 2 condyle pad liners, and 4 straps, wash and reassemble without losing any pieces. While entirely possible, the task is not ideal and conducive to keeping your gear clean.

*Stoko K1:* Throw it in a wash bag and wash it! That is how easy it is to keep your Stoko K1 clean and comfortable for the long haul.

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