Leg brace with a kickstand could alleviate discomfort for those healing from leg injuries

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MAXA Bracing, co-invented by Akshay Rao and Nick Gunady, has developed a full leg cast accessory that supports injured legs while promoting better posture and comfort. Nathan Stehle, a member of Purdue University's Bechtel Innovation Design Center, demonstrates how the MAXA Brace would support his leg while seated. Credit: Purdue University image/ Jared Pike

A comforting innovation for those suffering from a lower-body injury is moving to the market all because one Purdue student wanted to alleviate his mother's discomfort as she recovered from a leg injury.

Purdue University students have developed an accessory for full leg casts and braces that elevates the injured limb slightly to provide joint relief. The innovation will help people rest easily when they are restricted by low mobility while healing from a major injury or surgery.

Akshay Rao co-invented the "MAXA Brace" with Tyler Stagge, Sahil Shah and Hanwen Gu, all juniors in the School of Mechanical Engineering, during a semester design project. Then, Rao co-founded MAXA Bracing LLC with Nick Gunady, a junior in the School of Aeronautics and Astronautics, to commercialize the innovation.

"At first, we designed the accessory for Tyler's mother," Rao said. "Most of her discomfort didn't come from the injury itself, but from the changes in her daily routine caused by her leg injury and related immobility."

The Centers for Disease Control and Prevention's Web-based Injury Statistics Query and Reporting System reported that 2010 had more than $8 million in medical expenses are related to leg injuries.

"Our invention is an accessory that can be attached to any standard full leg brace or cast," Rao said. "The accessory suspends the injured leg off the ground while seated, easing pressure on the user's hips and back. This makes everyday tasks, such as eating at the dinner table, much easier than before."

In a full leg cast or brace, patients cannot bend their legs at the natural 90-degree angle, which can cause unequal tension in their hips and backs. Other side effects resulting from long periods of sitting are

decreases in blood circulation and alertness, according to HealthbyDesign.

The MAXA Brace is positioned underneath the calf of an injured leg with adjustments to the device's bipod legs for the height appropriate to the user. The invention holds the injured leg at a natural angle that levels the hips and straightens the back. As a result, the support accessory helps users avoid discomfort related to unequal weight bearing in the hips.

"Our product has the ability to drastically improve comfort during the recovery stage for patients with severe leg injuries," Rao said. "Our goal is to develop a device that reduces physical stress on the body, so that patients can focus on their physical therapy and healing process. That's why user accessibility and comfort have remained priorities throughout the design process."

Provided by Purdue University

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