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3D printing leads to lightweight knee brace for the elderly

The brace is meant to help older adults with chronic knee pain or who have undergone knee surgery.

By Alejandra O'Connell-Domenech | Dec. 15, 2021



NTU Singapore

Story at a glance

Delsson, a Singapore-based engineering firm, along with specialists from Nanyang Technological University have used 3D printing to create a light-weight knee brace.

The new brace is roughly 30 percent lighter than a traditional knee brace.

Designers used lightweight plastic and assistive springs to help reduce the brace's weight.

A Singapore-based engineering company with the help of specialists from the Nanyang Technological University, Singapore have created a new lightweight knee brace using 3D-printing technology.

According to the engineering company, Delsson, designers used lightweight plastic and assistive springs to help create the new brace, called X-Brace, which weighs roughly 30 percent less than a traditional metal knee brace, according to a release.

Delsson believes that X-Brace will revolutionize the way physicians and physiotherapists will treat different knee conditions since the amount of assistance the brace can give to a patient can be customized and ranges from six kilograms to 32 kilograms of force.

“In my over 25 years' of experience practicing orthopedic surgery, I have come across many patients with knee pain. Both young and elderly patients with knee problems often have weakened muscles as they adapt their walking style to reduce load bearing on the knee,” said Jeffery Chew, chairman and CEO of Centre for Orthopaedics in Singapore.

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“The lives of patients with weak muscles continue to be severely limited by knee pain despite treatment. The X-Brace reduces the load on the knee, helping patients to walk with less pain in their journey to complete recovery.”

Knee pain is common among older adults with about a third of Americans over the age of 65 reporting some form of knee pain, one study found. And in 2017 about 20 percent of people over the age of 60 living in Singapore suffered from chronic knee pain, according to TODAY.

“With a fast-aging global population, light-weight assistive orthotics enabled by 3D printing - such as personalized knee braces, will increasingly become an essential tool in geriatrics, to achieve better elderly patient care and outcomes,” said Ho Chaw Sing, co-founder and managing director of the National Additive Manufacturing Innovation Cluster which supported the collaboration.