

## AVEO, Shoe to Cure Ankle Muscle Stiffness

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Contracture ankle is the limitation of motion due to ankle muscle stiffness or joint deformation. UGM student, Muhammad Fahmi Husaen, has experienced this disorder.

He suffers from DMD (Duchenne Muscular Dystrophy), which may lead to paralysis. He had never received physiotherapy before that made the muscles stiff. "To prevent the stiffness, patients ought to do a regular physiotherapy which takes much time and cash while not everyone can do it," he lamented.

This inspired Fahmi and two colleagues to create AVEO shoes, which give automatic motions like physiotherapy. With AVEO, the duration of physiotherapy can be shortened from 30-60 minutes to 15 - 30 minutes.

Fahmi explained AVEO would also prevent soreness due to an extended duration of immobility. For patients with stroke, AVEO can cure the leg. Fahmi explained the shoe design was based on Ankle Foot Orthosis (AFO), which is used by people suffering from paralysis. But current AFOs are static unlike AVEO which is automatic.



AVEO uses servo and micro-controller arduino to run the mechanism. Using 5000 mAh batteries, the shoes will last up to 1,5 - 2 hours. He said it cost Rp2,4 million to make the shoe and it would cost approximately Rp1,5 million if produced in mass.

According to dr. Guritno Adistyawan, Sp.KFR, specialist at UGM Hospital, AVEO would much help patients with stroke, cerebral palsy, dystrophy muscular, and so on, because the shoes could bring back the strength of the legs and prevent muscular stiffness.

Guritno expected with AVEO, the work of physiotherapist will lessen as the physiotherapy gets shorter and manual work reduces. The shoes currently are a prototype. "I hope after further developments, the shoes will be useful for patients of contracture ankle," he said.

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