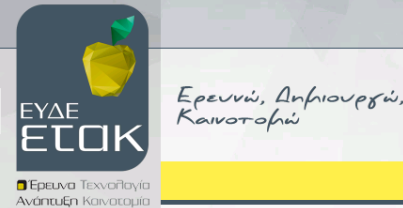


EU R&D Project



UPrevent: SMART INSOLE FOR FOOT ULCER PREVENTION IN DIABETIC PATIENTS

POLYTECH S.A. in cooperation with the companies "BIOMECHANICAL SOLUTIONS - BME" and "SB Technologies", and the research institutes of the University of Thessaly- Department of Medical School of Health Sciences - and the National Center for Research and Technological Development -CERTH-, will proceed with the implementation of the project "**UPrevent - Smart Insole for Foot Ulcer Prevention in Diabetic Patients**" after submitting the research proposal which was approved by the ESPA 2014-2020 "Research-Create-Innovate" business program.

PARTICIPANTS

1. POLYTECH SA
2. BIOMECHANICAL SOLUTIONS - BME
3. SB Technologies
4. University of Thessaly- Department of Medical School of Health Sciences
5. National Center for Research and Technological Development-CERTH

SCOPE

It is estimated that on an average 7% of the world population are diabetics now and this number is estimated to increase to 8.3% by 2030. On an average every 30 sec an extremity is amputated due to complications of diabetes mellitus and the majority of these amputations are secondary to foot ulcers.

Diabetic foot ulcer is not only a patient problem but also a major health care concern throughout the world.

Diabetic foot ulcer is one of the most common and serious complications in diabetic patients. Treatment of infection in diabetic ulcer is difficult and expensive. Patients usually need to take long-term medications or become hospitalized for an extended period of time. It is estimated that usually 15-25% of diabetic patients develop Diabetic foot ulcer during their life-time. On the other hand, more than 70% of patients who have developed Diabetic foot ulcer, experience an exacerbation of the

disease in the next 5 years. If an ulcer develops, unfortunately the treatment is challenging and with long duration. Teamwork consists of orthopedic surgeon, endocrinologist, infectious disease physician and a trained nurse in dressing, necessary to care for the wound. Moreover, diabetic foot ulcer treatment is expensive. On an average, the year treatment cost for wounds in Greece is 6.143 Euros. However, if the wound becomes complicated and amputated, the cost will rise to almost 60.000 Euros. Therefore, based on the noble quote in health care profession "prevention is better than the treatment of the disease", the purpose of the present proposal is to develop a smart insole for foot ulcer prevention in diabetic patients. Pressure sensors and actuators will be embedded into customized insoles to redistribute high-risk plantar pressures in localized plantar regions, such as metatarsal head and heel regions. The automatic adaptations of the shoe insole's rigidity will redistribute the plantar pressure when the plantar pressure, as detected by the insole sensors, exceeds the preset threshold level.

OBJECTIVE

The expected technological outcome of this proposal is the development of a smart shoe insole designed to automatically redistribute plantar pressure to the legs of patients with diabetes to prevent ulceration.

In addition to the enormous social impact of this project, in the diabetic foot problems we can also add the enormous financial costs. According to experts, these costs can be burdensome for any health system, as they are constantly reproduced by the patient's long stay in the hospital, rehabilitation costs and the increased need for home care and social services.

For these reasons, the UPrevent project through the proper prevention of the development of ulcers in diabetic patients, will make an important contribution to the viability of the national health system.