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UCT Biomedical engineers design affordable adrenaline auto-injector to assist people prone to allergies

People with allergies to certain foods, bee stings, and so on, develop an auto-immune condition called anaphylaxis and when the person is exposed to a substance that triggers an allergic reaction, they need to use an adrenaline auto-injector within 15 minutes. If they are unable to do this the situation could be fatal – according to Associate Professor Mike Levin, head of the Division of Asthma and Allergy at the University of Cape Town (UCT).

Adrenaline auto-injectors on the market can be expensive, expire within 18 months, and can only be used once.

Biomedical engineers from the Medical Devices Lab at UCT have developed a local, and affordable equivalent.

The ZibiPen, a reloadable adrenaline auto-injector, will have massive implications for end users with vials of adrenaline available for a fraction of the cost.

“As we move towards a more westernised diet, the rates of allergies and anaphylaxis increase,” explained Gokul Nair, who invented the technology alongside Associate Prof Sudesh Sivarasu and Associate Prof Levin.

The predication is by 2020–2026 the rate of allergies and anaphylaxis will increase by over 40 to 50%.

Current devices in the market are unintuitive and are based on the size of an average male which could pose problems for children, women and the obese. The ZibiPen can be customised for any patient with needle length and dose calculated by clinicians and set by pharmacists. This simple step is going to make this device more clinically effective, as well as more affordable.

One of the main challenges was developing a device that could exert a force of around 200 newtons, about 20 kilograms, in a small device. But the team managed to develop an effective patent pending spring-based system configuration.

Associate Prof Sivarasu, head of the Medical Devices Lab explained: "Here you have a technology which can be very easily made accessible to the middle- and low-income group as well. But it is not made so because of business reasons, and also because the [current] technology doesn't support it."

The ZibiPen was recently recognised in the Emerging Medical Innovation Competition at the Design of Medical Devices Conference, where it placed second and was awarded a full technical and market evaluation by the Medical Industry Leadership Institute (MILI), valued at R180 000.

The competition is open to all technologies with potential to create an impact in the healthcare space. The inventors were up against stiff competition, including state-of-the-art technologies, some fully developed and already out in the market, others addressing complex medical problems.

Research Contracts and Innovation at UCT partnered with the innovation team at a very early stage and has facilitated the intellectual property protection and commercialisation of the technology.

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