

Development of software that "predicts" sudden cardiac death

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At Galway Hospital in Ireland, a new device is used to "predict" cardiac events in people at risk of sudden cardiac death. This technology was developed by a Mexican researcher, and the city's university patented it, looking to sell it to specialized companies.

In 2013, the hospital cardiologists used this technology to diagnose

[cardiac events](#) and test its accuracy. The software is in the process of prototype and marketing.

In Ireland, there are six million inhabitants and eight thousand of them are Mexicans. The researcher Antonio Aguilar is one of them, he went to that European country to visit family and learn English, and decided to stay to complete an engineering degree in electronics and continue with postgraduate studies. Four months ago, he founded his own [company](#) of medical software for hospitals.

The company's history begins with his PhD research, a method to diagnose patients at high risk of [sudden cardiac death](#). "I decided to focus on sudden [cardiac death](#) because it is a condition that kills many people and is very difficult to predict."

Through a scholarship obtained in a research institute of Galway, he began developing an algorithm that, by testing the patient, makes an electrocardiogram and record of 15 minutes of the patient's heartbeat. The algorithm processes this information, and applies a statistical model to determine if the patient is at risk of arrhythmia, which is the sign of sudden cardiac death.

"When there is less variability in the heartbeat of a patient, this indicates a problem. We have studied the electrocardiogram of many patients with diabetes and other cardiovascular diseases and [heart rate variability](#) is very different between ill and healthy people. A patient before suffering an arrhythmia has certain patterns which can be detected and the variability in heartbeat is lower. With this algorithm we can 'predict' whether the patient will have an arrhythmia hours before it happens."

The researcher, who is a member of the Network of Mexican Talent Abroad, Chapter Ireland, used a database of 400 patients to "prove" the algorithm and diagnose patients at risk for arrhythmias.

Although he was born in Irapuato, Guanajuato, Mexico, Antonio Aguilar lived in Acapulco, Guerrero and Nuevo Laredo, Tamaulipas, where he studied the first year of engineering at the Technological Institute of Nuevo Laredo.

"From the age of nine, I knew I was going to devote myself to science or computing. I studied engineering because I always got the numbers, the mathematics. I always liked computing and especially electronics and robots. "

In Ireland, he experienced a "good period in the country's economy." While in the third year of his career, he entered an internship at a company developing software for Intel, Motorola and other international companies.

"They liked my work and I was offered a job as an engineer in software, even without finishing my [academic] career. The company allowed me to continue my career studying part time. In fact, the company handled my work visa. In 2003, I finished my career, the company closed its branch in Galway, and a Swedish friend told me about a scholarship to do a masters in Stockholm, which I applied for and was accepted at the Royal Institute of Technology (KTH) in Sweden ".

His master was performed during two years in microelectronics, focused on developing microprocessors. He returned to Galway and linked to the health area implementing wireless networks in the hospital of Galway, where he developed an application to review patient's records electronically.

There he worked as an engineer developing medical software, and was offered a job as a researcher at DERI, an institute at the National University of Ireland, (NUIG) where he worked three and a half years, with projects in medical informatics and bioinformatics.

"When I was in this institute my supervisor told me that there was a grant to start a PhD. I was accepted in the project to develop the algorithm and diagnose patients with sudden cardiac death. "

Antonio Aguilar mentions that in Ireland there is much support for students and businessmen, and he is an example, because since he was a student a lot of opportunities have presented.

When founding his own software company, Healthformics Ltd., he had the support of the Irish government. "My plan is to develop technology here, try the software in several hospitals, implement it in Mexico and sell it to the rest of Latin America."

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