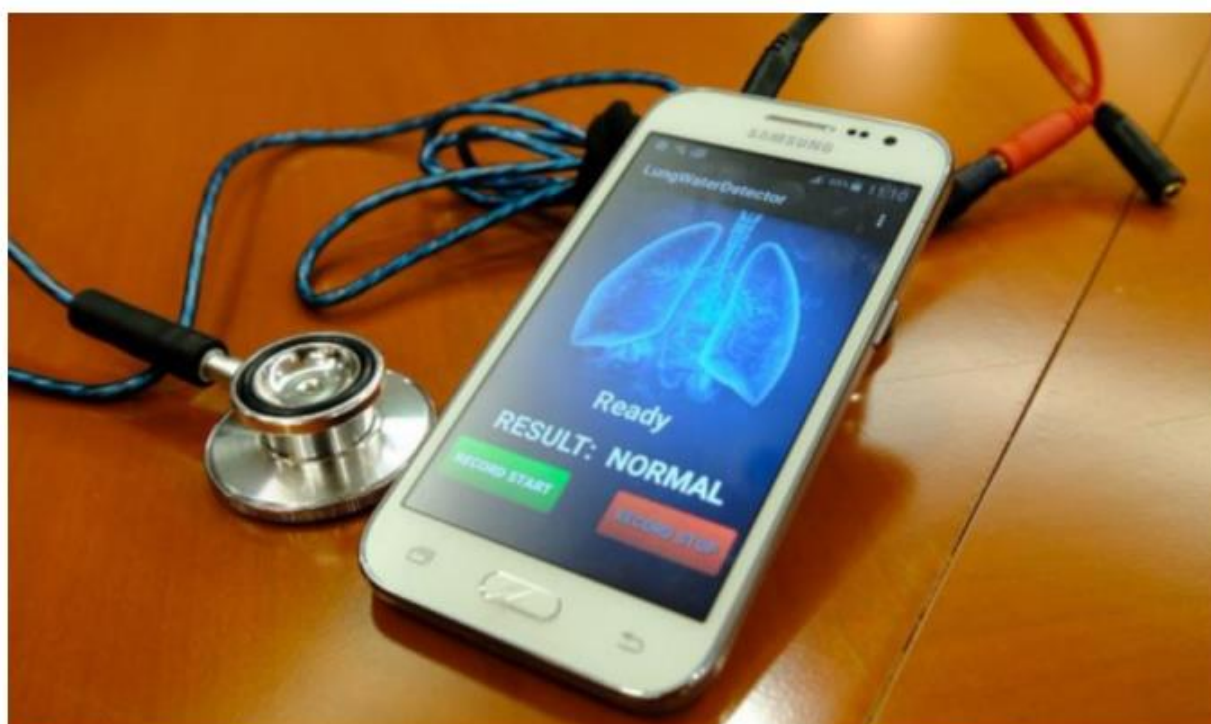


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Detecting Heart Failure At Home

Researchers have invented a handheld device that can detect symptoms of congestive heart failure in ten seconds.



AsianScientist (Dec. 6, 2018) – A Singaporean research team from Nanyang Technological University (NTU) and Tan Tock Seng Hospital (TTSH) has invented a handheld medical device that could enable early intervention for patients with congestive heart failure.

One in five people worldwide run the risk of developing congestive heart failure and the risk of disease onset increases with age. As there is no cure for congestive heart failure, patients can

only monitor their health closely, implementing lifestyle changes or taking medication to prevent their heart function from deteriorating irreversibly.

Conventionally, to detect congestive heart failure, doctors check for fluid accumulation in the lungs, perform medical imaging of the heart and lungs, or rely on blood-based tests. These methods must be performed in a clinic or hospital, can be costly and require a longer time to complete.

In contrast, the portable innovation devised by researchers at NTU and TTSH allows patients to rapidly identify fluid accumulation in their lungs from the comfort of their homes. The apparatus, which resembles a stethoscope, is made up of an acoustic sensor connected to a smartphone.

The device first picks up breathing sounds through a sound sensor. Through a mobile app, the sound signals are then sent to a server located in the cloud. The NTU-developed algorithm stored in the cloud then processes these sound signals and the results are shown on the mobile app. This whole process takes about ten seconds to complete.

Led by NTU Associate Professor Ser Wee and TTSH Associate Professor David Foo, the team carried out a pilot study using lung sounds recorded from TTSH's congestive heart failure patients. Their device was capable of identifying patients with the condition with 92 percent accuracy—comparable to the existing 'gold standard' diagnostic methods such as X-rays and CT scans.

“Patients can monitor their condition at home and use the device whenever they feel slightly breathless. It is potentially a game-changer in the management of ambulatory heart failure patients. It can also provide a rapid and accurate acute diagnosis of heart failure in situations of undifferentiated shortness of breath symptoms,” said Foo.

The research team has filed a patent for the invention and is now refining the product. They will seek clinical and regulatory validation for the product before mass producing it.

“The next wave of medical technology start-ups will see the massive proliferation of smart medical devices that rely on artificial intelligence and sensing technologies. That will enable personalized self-assessment and screening of cardiopulmonary and other diseases, and revolutionize the way healthcare is managed in future,” said Ser.

Source: Nanyang Technological University.

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