

E-STETH:

An innovative locally-produced electronic stethoscope



THE PROBLEM

Auscultation using the stethoscope is integral to physical examination, especially for seriously ill patients. In this examination, the bell or diaphragm of an acoustic stethoscope is in direct contact with the patient's skin while the earpiece is inserted into the healthcare worker's ears. Lung auscultation is a simple, low-risk procedure that helps in proper patient diagnosis. Given the current pandemic situation, healthcare professionals are obliged to wear personal protective equipment (PPE) to protect themselves and avoid contact with infected patients. As a result, the normal auscultation process, which requires direct stethoscope contact with the patient, is compromised to avoid the spread of infection.

A suitable way to do auscultation while avoiding the spread of infection is through the use of an electronic stethoscope. However, to date, each electronic stethoscope costs at least thirty to forty thousand pesos (PHP 30,000-40,000). Using a single electronic stethoscope unit for a hospital ward may result in the device transmitting the virus from one patient to another, as stethoscopes are known to induce bacterial and viral epidemics in the healthcare setting. Hence, there is a need for an alternative way to do auscultation while preventing the exposure of healthcare workers to the COVID-19 virus.

THE SOLUTION

To address the challenge of performing physically-distanced auscultation, the collaborative study of University of the Philippines College of Medicine-Surgical Innovations and Biotechnology Laboratory (S.I.B.O.L.) and University of the Philippines Diliman Electrical and Electronics Engineering Institute, led by Dr. Michelle Cristine B. Miranda, through the funding assistance from the Department of Science and Technology-Philippine Council for Health Research and Development (DOST-PCHRD), has successfully produced **E-steth**, a homegrown, low-cost acoustic-electronic stethoscope.

The E-Steth prototype is enclosed in an easy-to-use and plug-and-play device with a minimal difference from using a conventional stethoscope. The production cost is generally more affordable but still offers the same key features as other available electronic stethoscopes in the market, such as accurate analysis, high comfort and range, and wireless technology. By using E-steth, healthcare workers can listen and play physiologic sounds over a loudspeaker, allowing them to perform auscultation without compromising their safety and hazmat suits.



TECHNOLOGY GENERATOR

University of the Philippines Manila
Project Leader: Michelle Cristine B. Miranda, MD

TECHNOLOGY DEVELOPMENT

E-steth is at Technology Readiness Level (TRL) 5. The device prototype is being improved through a validation study. They are currently in need of investment funding for improving prototype 2 and developing prototype 3 to further device optimization, larger scale validation research, and clinical trials.

Interested technology adopters may send a letter of intent addressed to:



Dr. Lourdes Marie S. Tejero
Director, UP Manila-Technology Transfer and Business Development Office
upm-ttbdo@up.edu.ph