Renaud Defrancesco Studio | Pneumoscope, 2023

The device

Our medical device **Pneumoscope** facilitates the diagnosis, follow-up and management of respiratory diseases such as asthma, COPD, pneumonia, bronchiolitis and COVID-19 through the use of AI-based algorithms.

As the famous Shazam® app, which associates a song with its author, Pneumoscope records, analyses and associates respiratory acoustic signature with a disease in real time. Thanks to the oximeter and the thermometer, the app not only informs the user on the likely diagnosis, but also gives the severity of the condition and suggests the appropriate management to the best care path. All of this data is stored in the app creating a personal electronic record facilitating the patient's follow-up.

Therefore, health professionals such as doctors, nurses, pharmacists or even patients themself can use Pneumoscope as a diagnostic and management support tool.

In addition, Pneumoscope can send in real time all the data collected to a remote specialist, and is therefore a perfect tool for telemedicine.

By facilitating early diagnosis or detection of worsening lung disease, Pneumoscope will help triage situations that truly require medical consultation, initiate treatment more quickly, and reduce the need for emergency room visits and hospitalizations.

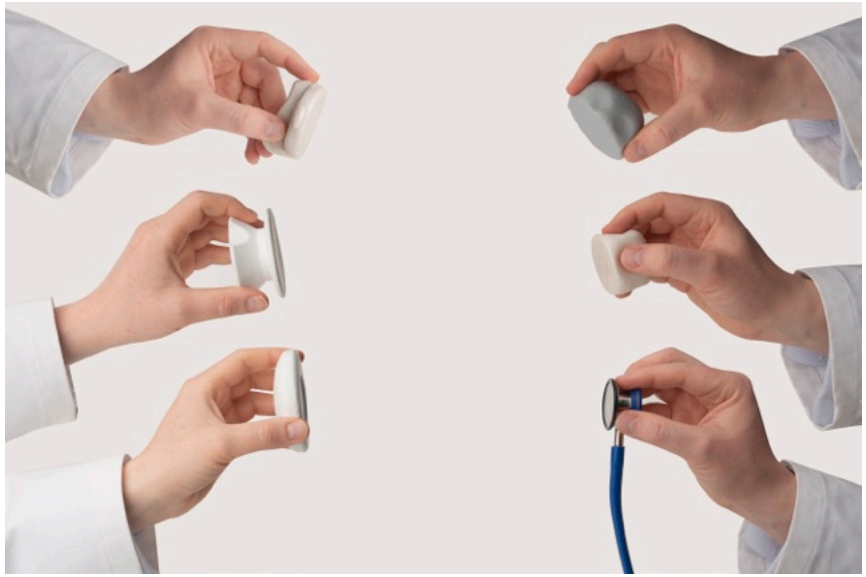
For chronic patients, Pneumoscope can detect early worsening of the lung condition as acute exacerbation of COPD. Our non invasive and inexpensive user friendly solution will also enables chronic patients to repeatedly monitor their condition avoiding unecessary hospital visits lowering global costs of healthcare.

By decentralizing care, Pneumoscope has the potential to democratize access to standardized respiratory assessment, as well as encourage early detection and regular follow-up while reducing bacterial resistance development and community transmission.

Mock-ups and prototypes

We developped more than twenty prototypes that we used for tests on forty people from the medical profession and we tested also the prototypes on hundred people for the ergonomics of the grip to find the perfect shape.

It was interesting to note that even if the technology made it possible to make a smaller object, the medical professionals found that the ergonomics of the instrument was better, barely larger. This final size has satisfied our entire panel of users.



Unique and innovative solution

In collaboration with renowned partners, Onescope has created the first 3-in-1 medical device **Pneumoscope** a patented technology combining a digital stethoscope, a pulse oximeter, and a thermometer powered by artificial intelligence (AI).

Lung sounds, oxygen blood saturation, heart rate, and temperature are simultaneously transmitted to an intuitive mobile app for real-time analysis and recognition of respiratory acoustic signatures by AI algorithms. The app not only informs the user on the likely diagnosis, but also gives the severity of the disease and suggests the best care pathway.

Our unique AI-based approach empowers healthcare professionals and patients themselve to perform rapid pulmonary screening to properly manage respiratory conditions. Onescope offers a decentralized solution that lowers healthcare costs and improves patient outcomes.

How it works

a simple 3-steps process

Recording lungs sounds, oxygen blood saturation, heart rate and body temperature

Real-time analysis with Artificial Intelligence

Diagnostic aid
Risk stratification
Outcome prediction
Disease management

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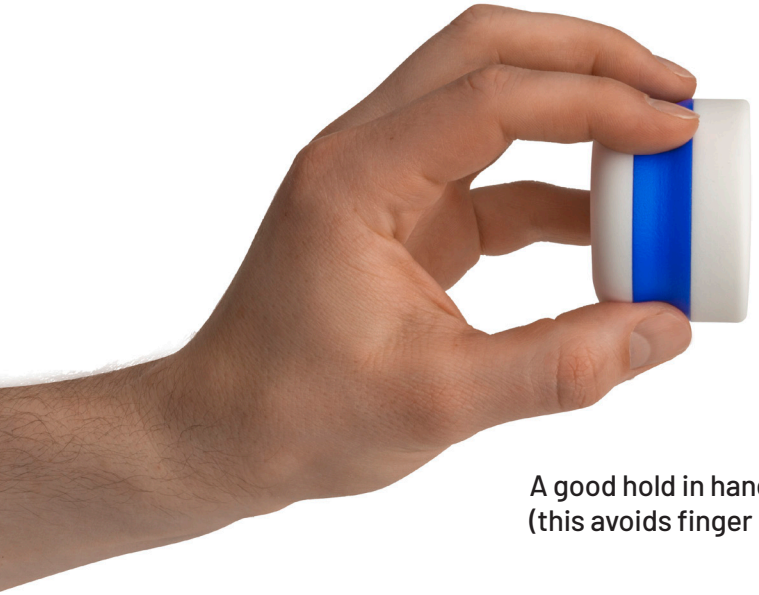
Features

Light indication on the RGB touch button:
- Device ON/OFF
- Device paired to the phone
- Device is recording

Easy access to the reflection pulse oximeter thanks to the recess on the top. It records blood oxygen saturation and heart rate.

On the underside, there is the non-contact thermometer and the membrane for the digital stethoscope to record the lungs sounds for respiratory diseases detection.



A good hold in hand without the fingers touching the patient (this avoids finger noises on the patient's skin).

Customizable

A request from users was the ability to customize it to easily differentiate theirs from others in the same hospital department. For this, we have developed the possibility that the ring, which serves as a grip, can exist in different colors and can be easily integrated into the production chain.
All materials in contact with the patient are bio-compatible.

Easily transportable

The shape of the device has also been specially designed to be easily cleaned using the disinfectant wipe (which is used in the medical environment).

For everyone, everywhere

Pneumoscope is not limited to health professionals (e.g. doctors, nurses, pharmacists) but can also be used by the patient themselves at home in a telemedicine purpose. They are able to auscultate themselves and be advice in real-time by a doctor.

The oximeter adapts to all fingers even those where it is normally difficult to take the oximeter in hospitals (with the small clip).

A Public Health Crisis

Respiratory diseases affect millions of people worldwide. The threat of emerging diseases with pandemic potential, like COVID-19, is increasing in the wake of climate change and globalization, highlighting the urgent need for greater responsiveness with decentralized care.

Traditional diagnostic methods can be inaccessible, time-consuming, and costly, while human interpretation of lung sound auscultation is often uncertain and variable, leading to misdiagnoses and increased healthcare costs. To address these challenges, innovative solutions are required to streamline the diagnosis and management of respiratory diseases, empowering both patients and healthcare professionals to work towards improved health outcomes.

Our mission : Transform respiratory care

Onescope's mission is to transform respiratory care with two primary objectives.

First, we aim to democratize high-quality medicine in Low- and Middle-Income Countries (LMICs) by offering an affordable, easy-to-use, and portable solution, bridging the gap in respiratory disease diagnosis for underserved populations.

Second, we focus on enhancing remote patient monitoring in high-income countries to improve patient outcomes and reduce healthcare costs associated with chronic respiratory diseases. Pneumoscope empowers healthcare professionals and patients with rapid pulmonary screenings, real-time analysis, and personalized care recommendations, facilitating proactive disease management and benefiting both patients and healthcare systems.

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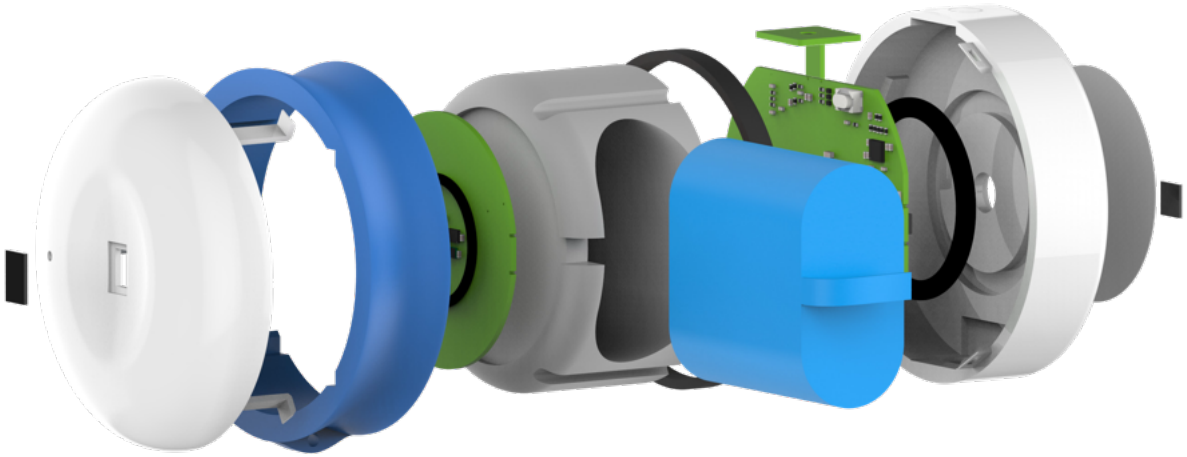
Swissness

For this project, we work in partnership with renowned Swiss academic institutions like the Geneva University Hospitals (HUG), EPFL, HEPIA, and non-profit organizations (NGOs) like Terre des hommes.

Many Swiss institutions (e.g Hospitals, Nursing aid, pharmacists) have shown great interest in acquiring and using our device.

In addition, we have 2 patents pending, one PCT for the Hardware and one national for the method we used to develop our AI models. We also protected the design of our device in Switzerland.

We are really proud that all the technology has been developped in Switerland and we have made partnership with different plastic injection and assembly companies in our country.



Pneumoscope

every breath counts

more information on
www.onescope.ch