

November, 2021



# Pneumoscope

An intelligent stethoscope for the diagnosis of lung diseases



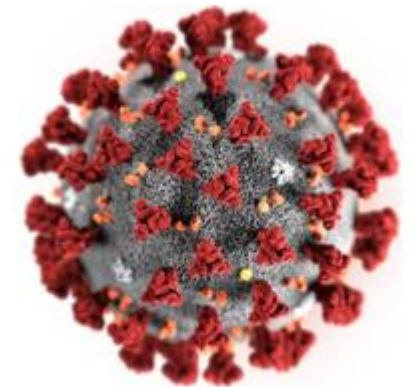
# PULMONARY DISEASES

- **COPD** affect **251 million** people, killing more than **3.3 million** persons each year
- **Asthma** affects **1/10** children and **1/14** adults in Switzerland
- **Pneumonia** is 1<sup>st</sup> cause of mortality in young children (< 5y) with **1 death every 30 seconds**



**EUR 379 billion** are the estimate annual costs of lung diseases in Europe Union

- **COVID-19** > 260 mo cases and more than 5.2 mo deaths  
Care disruption, incalculable cost ....



# CURRENT SITUATION FOR DIAGNOSIS



**Standard stethoscope**



**Requires training  
and expert use**



Doctors



**Specialist  
doctors**



**Family  
doctors**



Other health professionals



**Pharmacists**



**Nurses**



**Medical  
assistants**



Patients



**Youths**



**Parents**



**Actives**



**Seniors**





# Intelligent Stethoscope for respiratory disease

## Digital Stethoscope



Multi-sensor  
medical device

## Performant Algorithm



AI-based models for  
respiratory diseases

## Smartphone App



User interface  
personalised for the user



# UNIQUE SELLING PRODUCT

## Software



**Electronic health record**



**AI-powered algorithms for diagnosis**



**Livestream & automatic sounds analysis**



## Hardware

**Smart microphone**



**Oximeter**



**Thermometer**



**SWISS  MADE**

# HOW DOES IT WORK?

« A Shazam® for lungs »



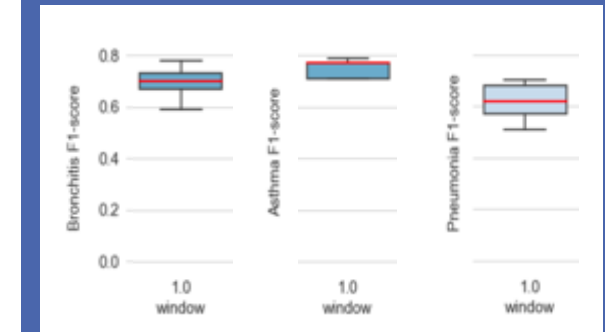
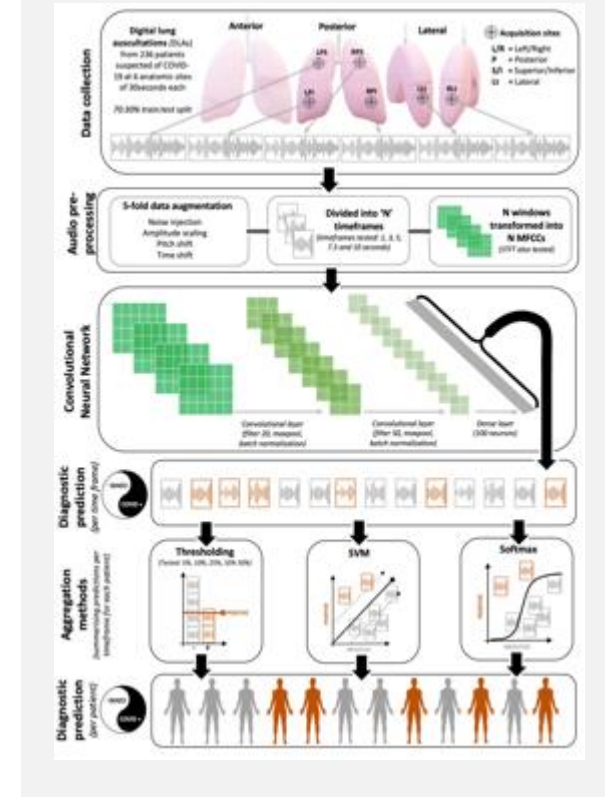
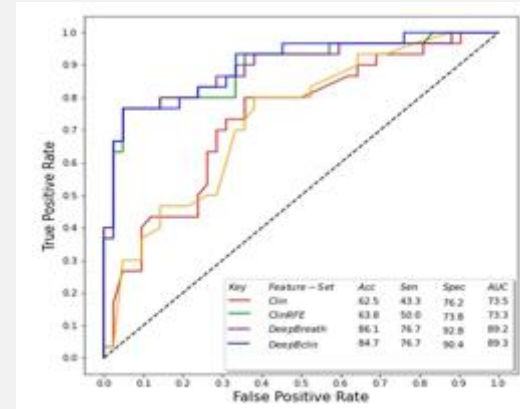
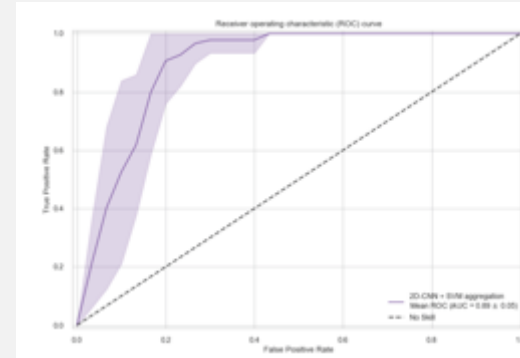
- Recording lungs sounds
- Blood oxygen saturation
- Heart rate
- Temperature

- Live analysis with Artificial Intelligence

- Diagnostic aid
- Disease severity grading
- Outcome prediction

# Automatic determination of

- Respiratory rate
- Heart rate
- Normal vs pathological
- Type of disease
- Severity
- Outcome



# NEW PARADIGM



**Intelligent stethoscope**



Doctors



**Specialist  
doctors**



**Family  
doctors**

Other health professionals



**Pharmacists**



**Nurses**



**Medical  
assistants**

Patients



**Youths**



**Parents**



**Actives**

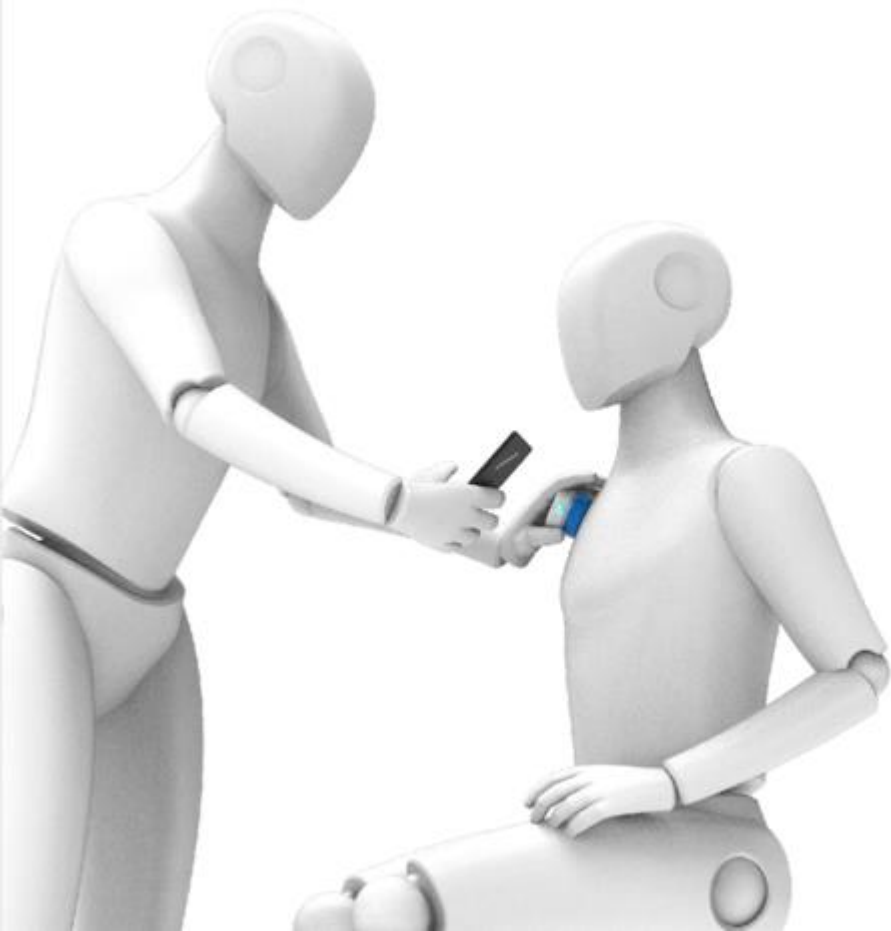


**Seniors**



# Value proposition

**H1/H2** Professional support  
B2B



**H3** Telemedicine  
B2C



- Empowerment
- Autonomy
- Confidence
- Improved patient/doctor relationship
- Decreased ER consultation
- Decreased hospitalization
- Decreased health cost

# MAJOR ACHIEVEMENTS

## Engineering

- Partnership with EPFL and HEPIA for technology development
- 3 AI-based models for automatic detection of respiratory diseases
- Functional prototype of hardware (MVP)
- App communicating with the device (MVP)
- Patentability for hardware and software

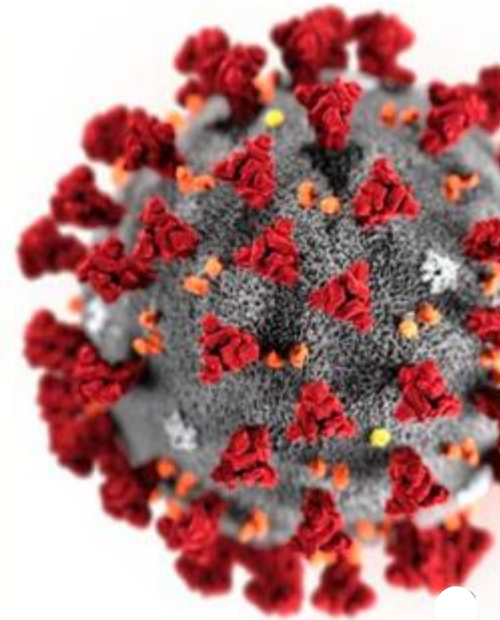
Patent : PAT7575EP00. - June 3rd, 2021



# MAJOR ACHIEVEMENTS

## Medical

- Types of respiratory diseases recorded: Pneumonia, Asthma, Bronchitis, COPD, COVID-19
- 100+ hours of recording to train our AI-algorithms (10K+ respiratory cycles)
- 2'000+ patients recorded + medical database in 10 countries worldwide
- Database of COVID-19 patient (500+)
- 1 published scientific article for COVID-19
- Partnership with HUG and IMAD



# MAJOR ACHIEVEMENTS

## Business

- Around 1.3 MCHF funds raised since 2019 through Swiss institutions (grants)
- Letter of intent from IMAD for the implementation of Pneumoscope in nursing care
- Letter of intent from OFAC for product distribution in pharmacies
- 3 won prizes since 2018 and many media coverage



# Transition from research project to Startup



Incorporation



Technology transfer

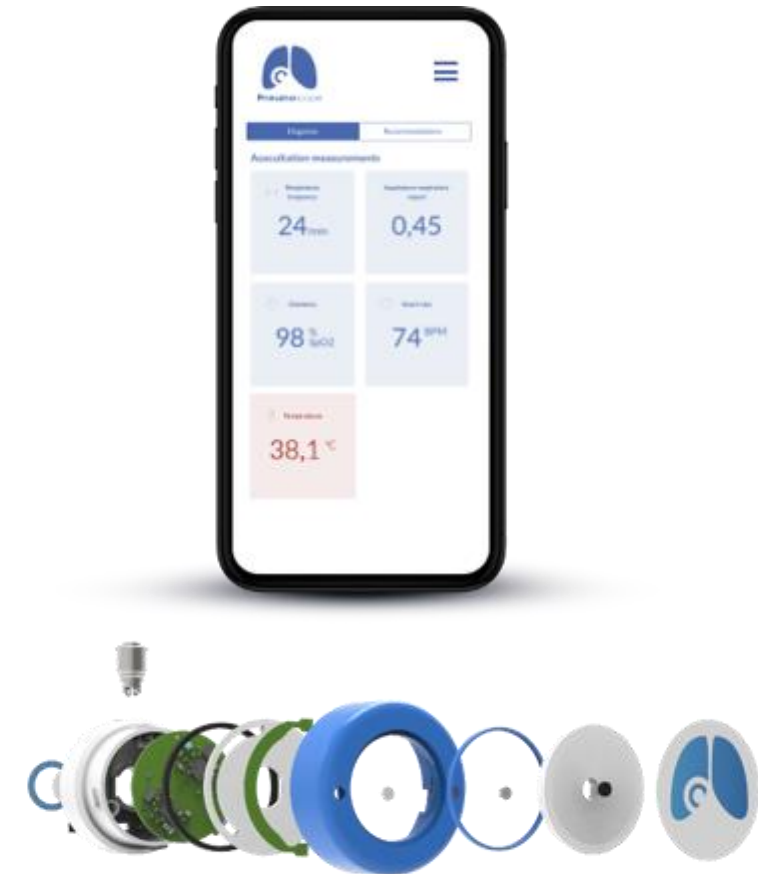


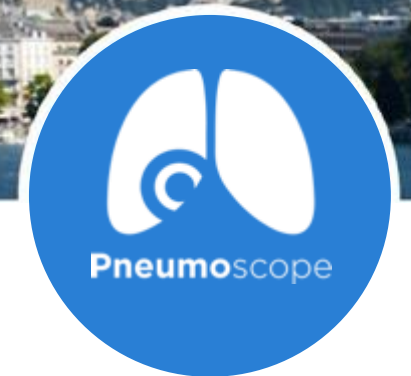


# MILESTONES & NEXT STEPS

## 2021-2023

| WHAT              | HOW   |
|-------------------|---|
| R&D               | Feasibility study + final product development     |
| Patent filing     | Patents for Hardware (done) & Software (on going) |
| CE certification  | CE for software and hardware + ISO13485           |
| Industrialization | Tests and validation for CE marked                |
| Market validation | Field studies with implementation partners        |





# Every breath counts

**Let's innovate together for better health!**