



## Medical devices

# Medical devices and eHealth solutions Compendium of innovative health technologies for low-resource settings

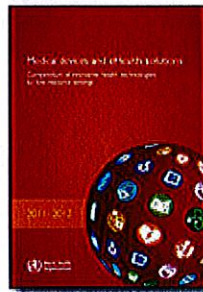
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### Background

Medical devices and eHealth solutions have the potential to save lives. However, too many worldwide suffer because they don't have access to appropriate health care technology.

The compendium series of innovative medical devices and eHealth solutions has been created as a neutral platform for technologies which are likely to be suitable for use in low-resource settings. It presents a snapshot of several health technologies which might have the potential to improve health outcomes or to offer a solution to an unmet medical need in low-resource settings. The compendium specifically focuses on showcasing innovative technologies that are not yet widely available in developing countries. It is released to encourage the dialogue between ministries of health, procurement officers, donors, technology developers, manufacturers, clinicians, academics and the general public. In doing so, WHO aims at raising awareness of the pressing need for appropriate and affordable design solutions and for further development and technology dissemination.



1. Background
2. Medical Devices
3. eHealth
4. Disclaimer

All submissions to the Call for innovative health technologies for low-resource settings underwent an evaluation process; technologies were assessed by an expert panel based on the material and evidence provided by the applicant as well as publicly available information. Note that for a selected technology, the inclusion in the compendium does not constitute a warranty for fitness of the technology for a particular purpose.

Technologies in the compendium are presented in one page summarizing the health problem addressed, the proposed solution and product specifications, based on data and information provided by the developers of the technologies concerned.

# Sputum mobilization device

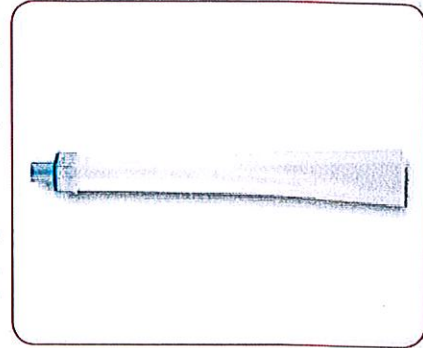
Country of origin | United States of America

Health problem addressed \_\_\_\_\_

Obtaining a proper deep lung specimen is a critical step in the diagnosis and management of respiratory tuberculosis; both for the adult community and pediatric community. Neither spontaneous samples, which result in many false negatives, nor sputum induction using hypertonic saline are practical or optimal.

Product description \_\_\_\_\_

A low frequency acoustic wave is generated at the mouth, travels retrograde into the lower airways and increases mucociliary clearance. This device, which is FDA approved, produces such a wave with vigorous exhalation to aid in secretion clearance.



Product functionality \_\_\_\_\_

The patient simply needs to blow repeatedly into the device with the same effort as blowing out a candle. The secretions mobilizes within 5-15 minutes after the therapy session ends. Its simple design and operation result in high compliance.

Developer's claims of product benefits \_\_\_\_\_

Existing technology is a spontaneous sputum sample. This does not produce the deep lung secretion required. The preferred method is hypertonic saline sputum induction. This method, though effective, is not widely used in the field because of complications and discomfort to the patient. Reducing the number of inadequate sputum samples and thus the frequency of false negatives. The device presented here is highly effective at producing a deep lung secretion sample, which saves times, and is very easy to use with no counter indications.

Operating steps \_\_\_\_\_

The patient sits upright, leaning forward slightly. The device works in 2 blow repetitions: blow out with enough force to activate the reed, and repeat steps to complete 2 repetitions. After two blow repetitions, the patient removes the mouthpiece, inhales normally, and repeats the above steps to perform up to 20 cycles. After 5-10 minutes, the patient coughs and collects sputum.

Development stage \_\_\_\_\_

As published in a 2009 study, use of this device enabled rapid diagnosis of TB in 47% of confirmed TB patients, who had produced no sputum prior to using the device. The device was user-friendly as assessed by a questionnaire completed by the patients.

Future work and challenges \_\_\_\_\_

This device could be manufactured at considerably lower cost with locally available materials, technologies and labor.

User and environment \_\_\_\_\_

**User:** Self-use/patient

**Training:** Healthcare professional delivers training, written instructions are provided, training takes 3-5 min

**Maintenance:** None

Environment of use \_\_\_\_\_

**Settings:** Rural, urban, primary (health post, health center)

**Requirements:** None

Product specifications \_\_\_\_\_

**Dimensions (mm):** 350 x 60 x 30

**Weight (kg):** 0.25

**Consumables:** None

**Year of commercialization:** 2006

**Currently sold in:** Australia, Austria, Canada, Germany, Greece, India, Italy, Japan, Lebanon, Malaysia, Philippines, Singapore, South Korea, Switzerland, Turkey, United States