Stethoscope Disinfectors

A complete Overview

STETCLEAN STETCUBE

Healthcare Associated Infections

HAIs are, by definition, diseases which affect patients inside hospitals and are not present or incubating at the time of admission.

HAIs could appear after discharge and besides patients, they often afflict employees in the hospital staff, too.

The issue:

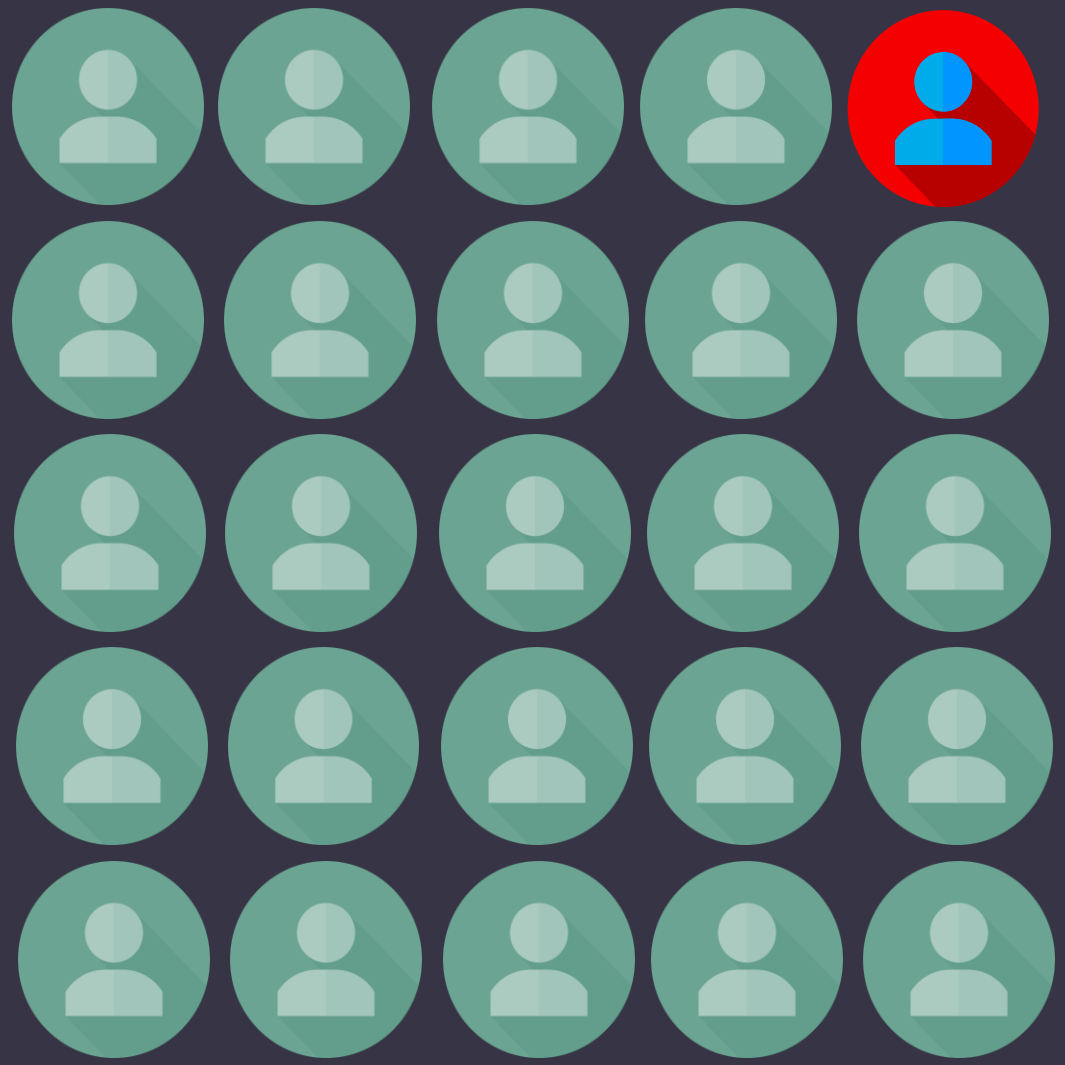
Healthcare Associated Infections

" No one should get sick seeking care.

Yet globally, hundreds of millions of people are affected every year by health care-associated infections (HAIs), many of which are completely avoidable and a large proportion are caused by antibiotic resistant organisms.

No country or health system, even the most developed or sophisticated, can claim to be free of HAIs."

World Health Organization



1 person every 25 admissions contracts HAI

increasing mortality

increasing costs

Healthcare Associated Infections

Statistics

Approximately 30% of patients in ICUs are affected by at least one episode of health care-associated infection.

Newborns are also at higher risk, especially in low income areas. Among hospital-born babies in developing countries, HAIs are responsible for 4% to 56% of all causes of death in the neonatal period.

Prevention, prevention, prevention

There is no solution that will,
by itself, solve the problem.
Protocols and best practices have
been established by the CDC (U.S.A.),
the World Health Organization,
and many others.

Prevention, prevention, prevention

Sterilization, disinfection and cleaning represent pillars of prevention actions that must be done every day inside every hospital and clinic.

Effective infection prevention and control reduces health care-associated infections by at least 30%.

Although significant progress has been made in preventing some HAIs types, there is much more work to be done.

UltraViolet Technology is a great opportunity to exploit

UltraViolet Germicidal Irradiation (UV-C)

Light can be divided in visible, infra-red and ultraviolet rays.

Ultra-violet rays (invisible) can be classified in:

UV - A (with tanning properties)

UV - B (with therapeutic properties)

UV - C (with germicidal properties)

UV–C lights penetrates inside bacteria, spores, fungi, molds, mites, and viruses.

UV–C high energy is absorbed at RNA and DNA level, damaging nucleic acids avoiding cellular growth & proliferation.

UV–C 's action is effective within seconds of irradiation.

UV–C disinfects at 99,9% any surface, water and air.

UltraViolet Germicidal Irradiation (UV-C)

UVGI technology is a physic disinfection method with a great costs/benefits ratio, it's ecological, and, unlike chemicals, it eliminates every microorganisms, also multidrug-resistant (MDR) pathogens.

UltraViolet Germicidal Irradiation (UV-C)

UVGI is a science-proved technology.

Research is still ongoing, but there is much evidence on the efficacy of UVGI and the proper way to use it, though its application has yet to fully mature.

How could we apply UV technology to prevent HAIs in medical environments?

What is one of the most contaminated surface inside any hospital?
Hands.

For this reason there are so many campaigns to educate people to wash their hands…clean hands can save lives!

So, what is comparable to hands?
What is the most common used tool in any hospital?

Stethoscope contamination

Stethoscope is the most widely used instruments in any medical environment.

It is used in rich countries, in poor countries, in private clinics, in field hospitals.

It is used by doctors, nurses and any other health professional.

Hands = Stethoscope

MAYO CLINIC

EDITORIAL

March 2014
Volume 89
Number 3

MAYO CLINIC
PROCEEDINGS

Stethoscopes and Health Care—Associated Infection

Over the past 30 years we have come to fully appreciate the enormous potential for person-to-person spread of virulent nosocomial pathogens (eg, methicillin-resistant *Staphylococcus aureus* [MRSA], vancomycin-resistant enterococcus [VRE], multidrug-resistant [MDR] gram-negative bacilli and *Clostridium difficile*, viruses such as influenza A, respiratory syncytial virus, and norovirus, and even *Candida* species) in the health care setting, with devastating infection being the most feared iatrogenic consequence and one of the greatest threats to hospital safety.[1,2] It has long been accepted that the major reservoir of nosocomial infection is infected or colonized patients and the major mode of transmission is the transient carriage of nosocomial pathogens on the hands of noncolonized health care workers having direct physical contact with patients.[3] Hand hygiene before and after direct patient contact—now most often with a waterless alcohol gel or hand rub—has become an uncompromising expectation for modern-day health care workers.[4]

Although it had long been held that microorganisms in the inanimate hospital environment do not play a significant role in the acquisition of nosocomial infection,[5] it has become evident in recent years that surfaces in hospitals touched by patients or health care workers readily become contaminated by "environmental pathogens," such as MRSA, VRE, *Acinetobacter baumanii*, *C difficile*, respiratory syncytial virus, and norovirus, which collectively have a unique capacity to survive dessiccation in a viable, transmissible form for days to months. Compelling epidemiologic data indicate that contamination of inanimate surfaces in hospitals is an important reservoir of these pathogens and has driven a move toward more comprehensive surface decontamination with bleach solutions, ultraviolet light, or aerosolization of hydrogen peroxide or peroxacetic acid.[6]

Auscultation of the heart, lungs, abdomen, and major arteries with a stethoscope has long been considered an integral part of the physical examination, and most health care providers prefer to use their own stethoscope. It has long been known that the diaphragms and bells of stethoscopes randomly sampled in a health care setting, such as a hospital, are almost universally contaminated by potential nosocomial pathogens,[7-18] most often staphylococci—MRSA up to 32% of the time[18]—but also *C difficile*,[17] resistant gram-negative bacilli, and even viruses,[19] and studies have shown that stethoscope contamination by these microorganisms is commonly acquired from colonized or infected patients.[9,10]

In this issue of *Mayo Clinic Proceedings*, Longtin et al[20] report an innovative study of ungloved physicians who auscultated MRSA-colonized patients with presterilized stethoscopes, showing that the fingertips of the examiners or the diaphragms of their stethoscopes acquired MRSA contamination during 76% of the examinations. They found a powerful correlation between counts on examiners' hands and the quantitative level of contamination of the stethoscope with each examination, both for total bacterial counts and for MRSA. The efficiency of transmission of MRSA from the trunk of colonized or infected patients to the hands of health care workers and their stethoscopes rigorously documented in this unique real-life study is almost staggering. One can ask, why are we all not MRSA carriers?

Given that microorganisms on contaminated stethoscopes are readily transmitted

Auscultation of the heart, lungs, abdomen, and major arteries with a stethoscope has long been considered an integral part of the physical examination, and most health care providers prefer to use their own stethoscope. It has long been known that the diaphragms and bells of stethoscopes randomly sampled in a health care setting, such as a hospital, are almost universally contaminated by potential nosocomial pathogens,[7-18] most often staphylococci—MRSA up to 32% of the time[18]—but also *C difficile*,[17] resistant gram-negative bacilli, and even viruses,[19] and studies have shown that stethoscope contamination by these microorganisms is commonly acquired from colonized or infected patients.[9,10]

acquisition of nosocomial infection,[5] it has become evident in recent years that surfaces in hospitals touched by patients or health care workers readily become contaminated by "environmental pathogens," such as MRSA, VRE, *Acinetobacter baumanii*, *C difficile*, respiratory syncytial virus, and norovirus, which collectively have a unique capacity to survive dessiccation in a viable, transmissible form for days to months. Compelling epidemiologic

gens.[11-14,16] As such, health care workers should be expected to routinely decontaminate the head of their personal stethoscope between patients, logically when they do postexamination hand hygiene.

Free download https://www.mayoclinicproceedings.org/article/S0025-6196(14)00070-6/abstract

Stethoscopes carry several different pathogens and they are usually never clean.

Doctors are focused on making diagnose and treat patients.

There is often rush between one visit and the other.

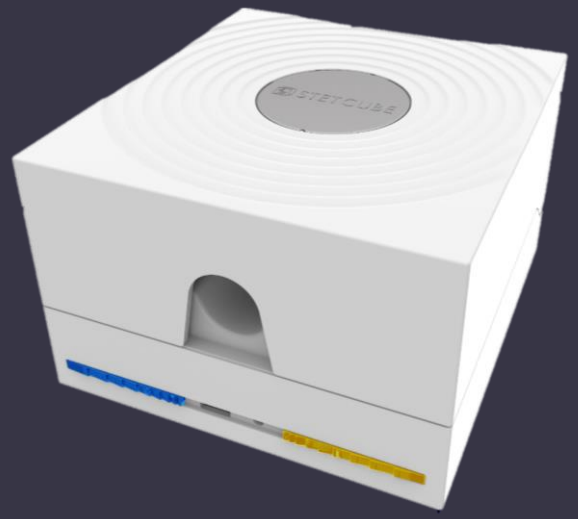
Common cleaning includes the use of disposable chemicals and the creation of special wastes.

How could we apply UV technology to STETHOSCOPES?

The most innovative source of ultraviolet rays are UV-C LEDs.
These microscopic UV light sources are able to achieve same results as standard UV lamps while offering revolutionary features in terms of portability, power and applicability.

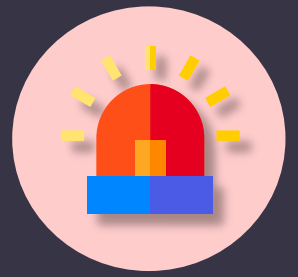
Since their recent implementation it has been possible to design new products for the sanitation of water and surfaces that cannot even be imagined just until a few years ago.

STETCLEAN



STETCUBE

automatic double level of treatment: 3 minutes for standard disinfection, 2 minutes more for a deeper sanitisation.



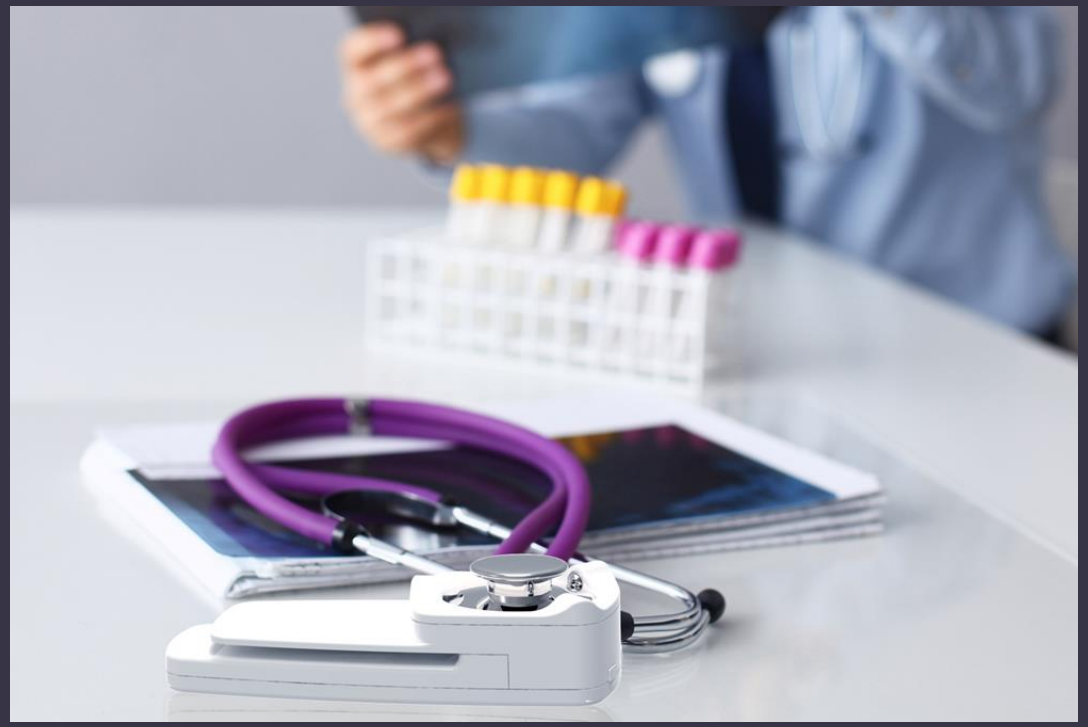
status light indicator: blue for ongoing treatment and treatment complete, yellow for low battery, charging, malfunction.

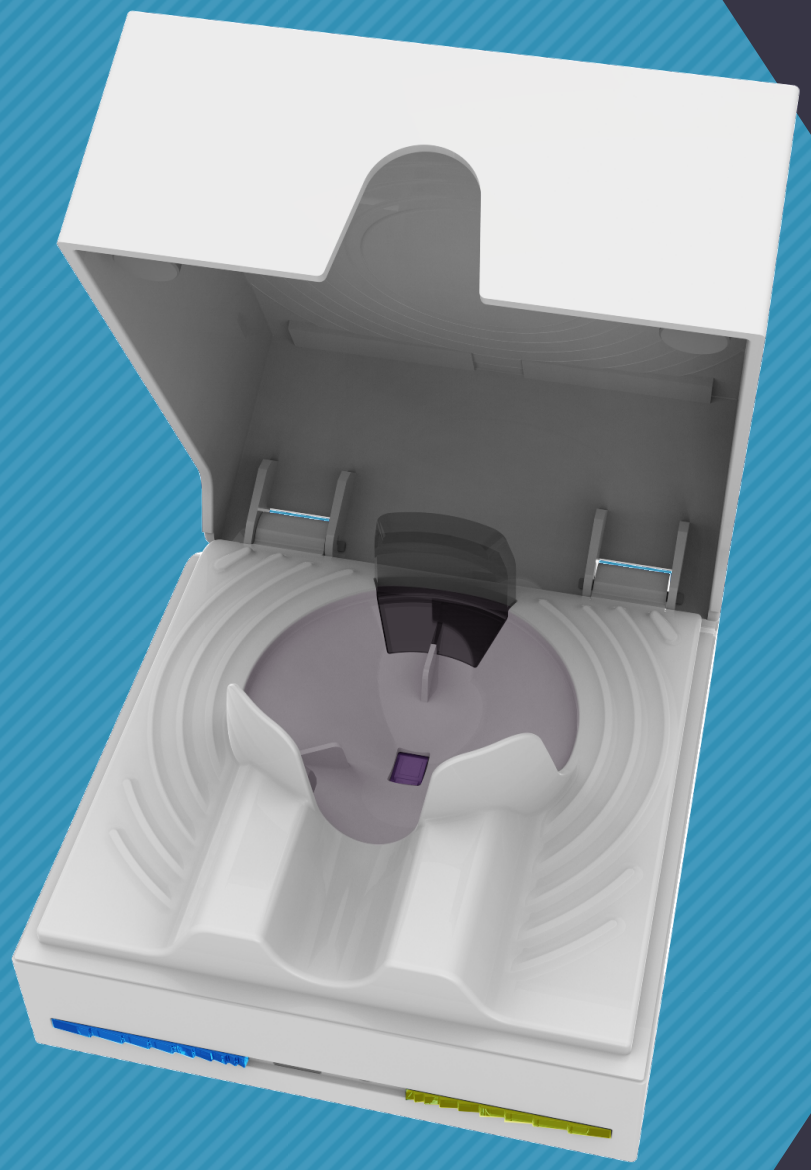
rechargeable battery with standard micro USB cable, high battery autonomy.

Proven results, several University tests, Scientific papers and in-vivo tests show the device's disinfection efficiency.

Wearable Disinfection

- Portable Version: designed to follow your stethoscope everywhere you go.
- double control system – optical sensor and mechanical – for use in operational safety conditions
- microprocessor for irradiation and security controls
- special polycarbonate body
- light weight (100 grams) and pocket sized (limited footprint), like a common smartphone
- fits with the most common stethoscope size (around 46 / 47 cm diameter, i.e. Littman Classic II)





Disinfection on your desk

- Desk Version: designed for “sharing”. It fits in hospital cart, desk, etc.
- With the optional supplied you can easily mount it on a wall
- double control system – infrared sensor and mechanical switch as you close the cover
- microprocessor for irradiation and security controls
- special shiny polycarbonate body
- compatible with every stethoscope type and dimension (pediatric, neonatal, cardiological...)


EC
EC


STETCUBE

Doctors said…

« it’s cool…definitely cooler than disinfectants! »

« it is so easy to use, the fact that works automatically makes the process very simple, fast and natural.»

« I think that wearing the device on my coat and carrying it on the medical cart act as a reminder of the need of hygiene »

« it is important to clean the stethoscope, have you ever clean it after every patient? »

Scientific papers

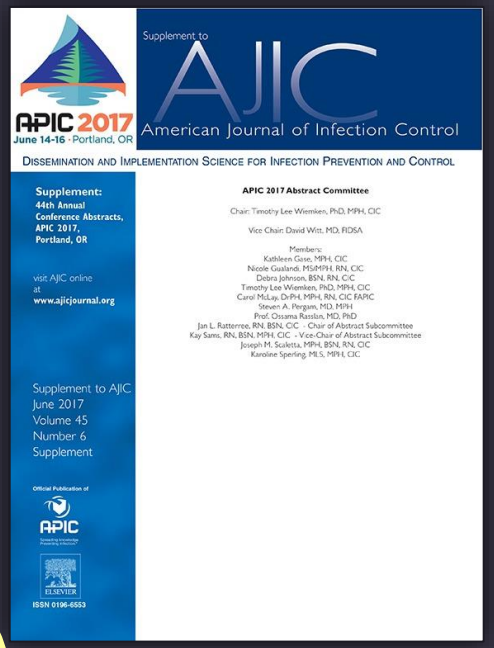
UNIVERSITY OF SIENA
Department of Life Science
Via A. Moro 2 - 53100 – Siena - ITALY

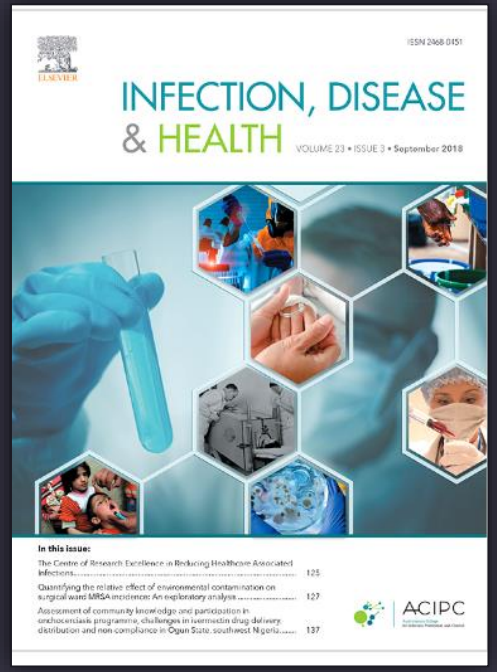
The study report was written under a Service Agreement between
University of Siena and Light Progress S.r.l.
Report (version 1.01)

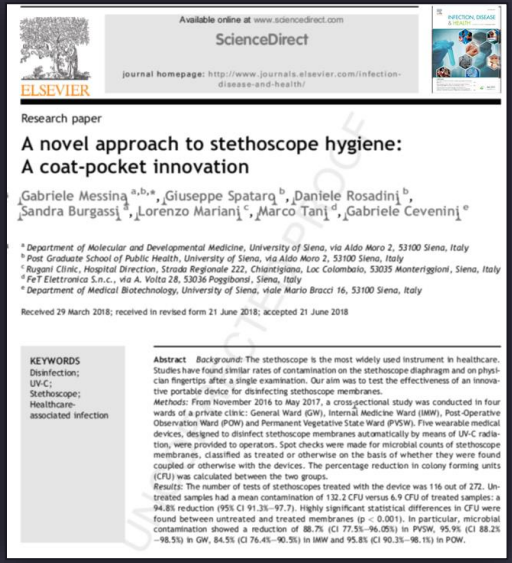
Siena, 22nd July 2016

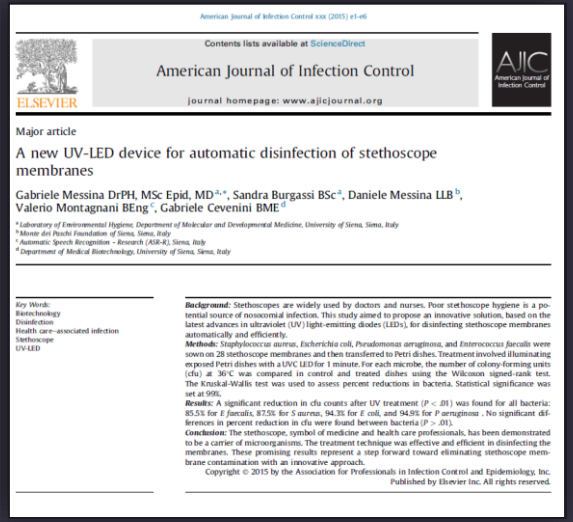
Microbiological testing of an hygienization device (Stet Clean) for stethoscope/phonendoscope

The study report was written under ls the Service Agreement (Rep. 1771/2014 Prot. 36520 e Rep. 4902/2016; Prot 69862/2016) between the University of Siena and Light Progress. Report (version 1.01)









www.stetclean.com

LIGHT PROGRESS