



While experts work frantically to lower pathogen transmission in hospitals around the world in the wake of the corona-virus, they have forgotten one of the simplest devices. The stethoscope.

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Houston, Texas
Sean Matula - mail@sbcsm.com

Sean Matula of SBCSM has filed a patent application, for a new revolutionary design approach to the stethoscope.

As healthcare providers make their rounds, listening to patients' lungs is part of protocol. The required deep breaths often make patients cough, spraying pathogenic droplets on the stethoscope. The unprotected device comes in contact with the healthcare worker's hands, face, medical equipment, and other patients – cross-contamination. If their next patient is immunocompromised, a slight brush against the stethoscope could be lethal.

Careful disease prevention practices include changing gloves and sanitizing hands thoroughly, but many medical professionals forget about the devices dangling around their necks throughout the day, which become hotspots for pathogens to accumulate. It's time to take the old design and improve it to save lives and protect our amazing healthcare workers.

Studies show that even when healthcare facilities implement interventions to encourage healthcare workers to disinfect their stethoscopes, this still does not happen due to high patient volume or emergency situations ([Journal of Infection Prevention](#)). Plus, correctly disinfecting a stethoscope in between patients can add up to 15-20 minutes per day – valuable time healthcare workers need for their patients.

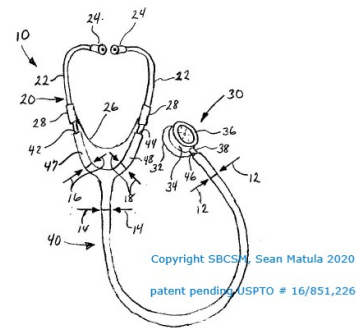


FIG. 1

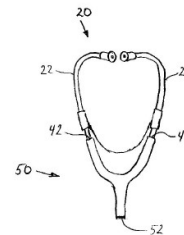


FIG. 2A

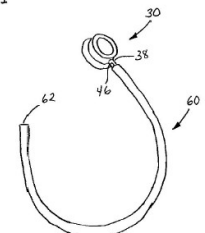


FIG. 2B

Some have attempted to fix the well-known problem by assigning exclusive stethoscopes to each patient or care provider. (For example, many NICUs assign a stethoscope to each incubator to protect babies). Then, the stethoscope does not transfer from patient to patient. Instead, multiple medical professionals insert the same tight-fitting ear pieces into their ears throughout the day, allowing bacteria to colonize and potentially cause infections – not a great solution for our hard-working medical professionals.

The Research Says It All

In a study by the [Journal of Infection Prevention](#), “out of 62 participants, 53.22% had NEVER cleaned their stethoscopes.” Initial swab samples showed over six types of bacteria growth. And that’s not counting viruses.

Furthermore, this is not just an American problem. A new stethoscope design is needed on a global scale. Canadian doctor Yves Longtin and Swiss doctor Didier Pittet wrote to the [Mayo Clinic Proceedings](#) urging that since doctors are not sanitizing their stethoscopes, “a more appealing, feasible, and scientifically sound solution is needed.” After seeing that “47% to 86% of health care workers do not disinfect their stethoscope regularly and only 6% to 15% disinfect their stethoscope after every use, [...] clearly, future research is warranted to identify methods to decrease the infectious risks associated with the use of stethoscopes.” ([All sources included in link.](#))

To put those percentages into perspective, in the most recent survey by the [American Hospital Association](#), the U.S. alone has over 6,000 hospitals with over 900,000 staffed beds. In 2018 – a year without a severe illness outbreak – the U.S. saw over 36 million hospital admissions. Pair that with the WHO’s findings that “55 hospitals across 14 countries revealed an average of 8.7% hospitalized patients suffering from [healthcare-associated infections],” and it’s obvious that we can’t afford 3 million people to become infected through hospitals at any time, especially during a pandemic ([Journal of Infection Prevention](#)). **Universal Detachable Stethoscope Design**

Engineering control solves the problem. This detachable stethoscope is broken into parts, just as with other medical equipment like thermometers and otoscopes. Instead of placing more strain and responsibility on healthcare workers to disinfect their stethoscopes throughout the day, this device decreases the risk of infectious disease transmission for both the healthcare provider and the patient.

One half of the device is assigned to the healthcare provider, and the other half of the unit is assigned to the patient. Designating separate parts greatly reduces the risk of disease transmission and protects both patients and workers in two ways:

- The upper half – earpieces and ear tubes – stay with the healthcare provider, **reducing transmission from provider to provider.**
- The lower half – acoustic tubing, bell, and diaphragm – are assigned to the patient, **reducing risk of infection from patient to patient.**

The design allows for **conversion of all existing stethoscopes with an adapter kit.** Assembly takes seconds, cutting the time it would take to fully sanitize an existing device.

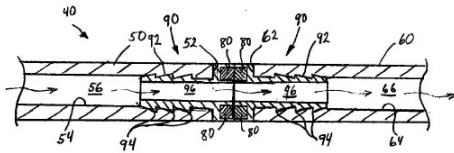


FIG. 7B

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patent pending USPTO # 16/851,226

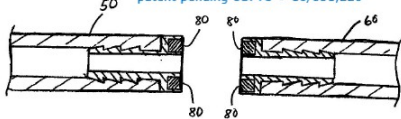


FIG. 7C

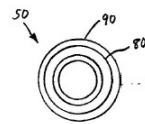


FIG. 7D

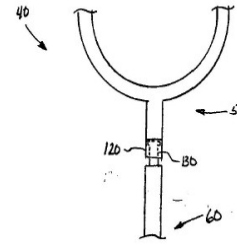


FIG. 9A

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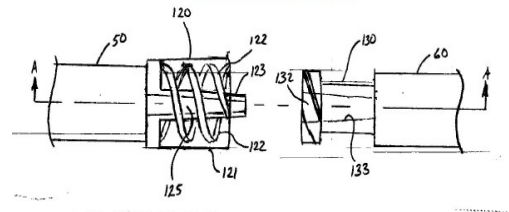


FIG. 9B

This adaptable design works in virtually any health care setting. In high-volume or emergency situations, the color-coded upper and lower pieces make the parts easy to identify and assemble. Quick and simple twist-lock or magnetized coupling ensures secure connections. In addition, metal-free versions allow the detachable parts to remain with the patient or doctor for safe imaging situations like X-rays or MRIs. The best part is that this design adapts to existing stethoscopes using common luer-slip attachments.

Does it accumulate excessive waste?

Not at all. At patient discharge or after completing the examination, the bell and tubing can be re-sterilized for later use, just as with hospital linens and other reusable medical equipment.

It's Time to Make a Change

With immunocompromised patients or highly infectious diseases, stethoscopes become as dangerous as unwashed hands. Detachable stethoscopes may play a surprisingly key role in diminishing pathogen transmission during illness outbreaks.

-Sean Matula, SBCSM

Additional Resources on Stethoscope Contamination:

1. American Academy of Pediatrics: Periodic Survey of Fellows #81 – Pediatricians’ Life And Career Experiences
2. American Hospital Association: “Fast Facts on US Hospitals”
3. American Journal of Infection Control: Bacterial contamination of stethoscopes with antimicrobial diaphragm covers
4. Annals of Internal Medicine: Hand Hygiene among Physicians: Performance, Beliefs, and Perceptions
5. Contagion Live: Stethoscope Disinfecting—We're Just Not Doing It
6. JAMA Internal Medicine: The Stethoscope: A Potential Source of Nosocomial Infection?
7. Journal of Infection Prevention: Assess Stethoscope Cleaning Practices, Microbial Load and Efficacy of Cleaning Stethoscopes
8. Mayo Clinic Proceedings: A “Solution” for Infectious Stethoscopes?
9. Mayo Clinic Proceedings: In reply—A “Solution” for Infectious Stethoscopes?
10. PubMed: Improving Stethoscope Disinfection at a Children's Hospital
11. Springer Link: Stethoscopes and nosocomial infection
12. The Journal of Hospital Infection: Bacterial colonization of stethoscopes and the effect of cleaning
13. World Alliance for Patient Safety (WHO): WHO Guidelines on Hand Hygiene in Health Care

This device is currently patent-pending.

To show your support and raise awareness, please share this article with others through social media.

To learn more and keep up with news on this invention follow on LinkedIn @ in/SeanMatula

Have additional questions? Contact SBCSM at mail@sbcsm.com

Sean Matula is an independent business consultant who specializes in Information Technology, Security and Health & Safety. Previously he worked for 20 years in emergency response serving the public and private sector. Professional work includes Law Enforcement, Fire & Arson, Technical Rescue and Emergency Medicine as well as extensive instruction and education experience. He is married to his wonderful wife Megan, “The Newborn Lady” a professional newborn photographer and Nurse.