



MedicCom

Case Study

12th October 2021



MedicCom is a communications device which enhances communication by clinical staff when wearing PPE. Worldwide, clinicians have found that enhanced respiratory PPE makes speaking to patients and colleagues difficult. MedicCom is an electronic device, which uses a throat microphone to pick up sound from outside of a PPE mask. The device acts as: (1) a voice amplifier to enable a clinician to be easily heard by the patient and the clinical team around the patient; (2) a Bluetooth headset enabling clear communication through a mobile phone for calls to the patient's relatives and to clinical colleagues; and (3) as a 'walk up and plug in' device to connect to a hospital internal telephone system.

Early in the pandemic, [Prof. Mehdi Tavakoli](#) from the [KTN Health Team](#) had a telephone conversation with Prof. Tim Coats from the University of Leicester. Prof. Coats had experienced first-hand the difficulty in communication while wearing a face mask and had devised an initial prototype solution. Prof. Tavakoli reviewed and short-listed several potential approaches with Prof Coats and contacted the Project Pitlane group of Formula One racing engineers, as they had previously worked on the UK Government's 'Ventilator Challenge'.

Prof. Mehdi Tavakoli introduced Prof Tim Coats to Andy Damerum and Bob Bell from Project Pitlane, along with their colleague, Jason Rees from Innova Technology. The team was enlarged to include Dr Emma Chung (Reader in Medical Physics at the University of Leicester) and Jasdip Mangat, Edward Pallett and Paul Doolan (Clinical Engineering at University Hospitals of Leicester NHS Trust). The team also included a technology transfer specialist, Carl Edwards from the University of Leicester.

With Prof. Tavakoli as a co-applicant and member of the project management team, a grant application was submitted through the UKRI Covid-19 funding stream to Innovate UK. This application was successful, and a production ready prototype device was created in just 6 months.

Prof. Tavakoli agreed to support the preparation of a Case Study by KTN about this project at the final project meeting. Prof. Tim Coats is an emergency physician, previous chair of the NIHR National Specialist Group for Injuries and Emergencies, and current chair of the Trauma Audit and Research Network (TARN).

Open

We value diversity of opinions, ideas, skills and perspectives.

Creative

We embrace ideas with curious minds and use our insight to uncover opportunity.

Collaborative

We are one team, working together across sectors, people and geographies to drive positive change.

Determined

We are determined to meet challenges with solutions and enable innovators to think and act beyond expectations.



Hi Tim, could you tell us a bit about the background behind MedicCom and the problems you encountered early in the pandemic when communicating in PPE?



Prof. Tim Coats

Surgeons have worn lightweight masks for many years with little impact on their communication, however these masks do not protect against the aerosol spread of viruses. At the beginning of the pandemic, doctors, nurses, and paramedics started to wear masks giving higher-level respiratory protection, such as FFP3 masks or elastomeric respirators. These masks are much thicker than the common surgical mask and attenuate speech, so it sounds very quiet. This is a problem in emergency care as the background noise levels are often loud - meaning that clinicians had to continuously shout to make themselves heard. We found problems when trying to talk to older patients with hearing loss. Nationally it was recognised that miscommunication was causing severe errors – for example

mishearing the difference between “the tube is in the right place” and “the tube isn’t in the right place” could lead to a fatal error.

Looking around to see if any devices were available to help, I found that there were many voice amplifiers available. From previous military experience, I had used a throat microphone while wearing a Nuclear Biological Chemical (NBC) protective respirator. Pairing a throat microphone and a voice amplifier meant that I could talk to the patient and the team around the patient. I also found that when plugged into a mobile phone the throat microphone enabled me to hold a clear telephone conversation, however I needed to be able to rapidly switch between these functions while wearing a PPE gown, and there was no device on the market which enabled me to switch between these functions.



I made an initial prototype (left) using commercially available components to illustrate a proposed solution to the team.

Open

We value diversity of opinions, ideas, skills and perspectives.

Creative

We embrace ideas with curious minds and use our insight to uncover opportunity.

Collaborative

We are one team, working together across sectors, people and geographies to drive positive change.

Determined

We are determined to meet challenges with solutions and enable innovators to think and act beyond expectations.



What does the MedicCom device do and how is it unique?

The MedicCom device takes the input from a throat microphone and enables the output to be switched between an integrated speaker, a Bluetooth connection to a mobile phone or a 'plug in' lead to a wired telephone. The Bluetooth connection also allows a wi-fi link to a smart speaker as an intercom from inside to outside the patient's room. The Bluetooth connection also allows whole team communication through a walkie-talkie app. You can buy a device which carries out each of these functions, but there is no device which integrates them together into a single communications unit.



The device is designed to be worn underneath a PPE gown, with a ridged casing and a button layout both designed to make the buttons easily located by touch. One button presses switches between voice amplifier and Bluetooth modes.

Where can we find out more?

Please [click here](#) to view an introductory video which demonstrates the use of the MedicCom device.

What are the challenges and opportunities facing your further development of MedicCom?

Our current challenge is finding a commercial partner and raising the capital investment to manufacture the device at scale to supply the NHS, and healthcare systems worldwide. We also need to access a distribution system which can sell into the NHS.

The opportunity is of increasing the quality of patient experience, decreasing errors due to miscommunication, and decreasing NHS staff fatigue by avoiding the need to continuously shout. There will be a long term need for high level respiratory protection for clinical staff, as Covid becomes endemic rather than pandemic, and we have an increased awareness of the need for protection from respiratory infections. This will give a long-term need for MedicCom within the NHS.

Open

We value diversity of opinions, ideas, skills and perspectives.

Creative

We embrace ideas with curious minds and use our insight to uncover opportunity.

Collaborative

We are one team, working together across sectors, people and geographies to drive positive change.

Determined

We are determined to meet challenges with solutions and enable innovators to think and act beyond expectations.



What specific help did KTN give you?

The project would not have been possible without the support and the linkage that KTN made between public service (the University and NHS Hospital) and Industry (Project Pitlane and Innova Technology). Without this input I would certainly never have thought that a group of F1 Racing engineers could be the project partners!

Having a close link with KTN was also very helpful during the grant application to Innovate UK. The application processes can seem complex, so it was invaluable to have guidance through the system, as well as advice about which aspects to emphasise in the application form. Prof. Tavakoli has supported this project from the start by inviting and facilitating formation of external members of project team, helping with proposal submission and project management during six-month project duration. He attended weekly, evening project meetings and the Innovate UK progress meetings. With his background in medical materials and medical technologies, he has also made some valuable contributions about polymeric materials selection and their resistance to cleaning/decontamination agents, as well as in identifying a manufacturing partner.

Acknowledgements:

The project team would like to thank Innovate UK/UKRI for funding this project. All the additional voluntary contributions made by the members of the project team and other collaborators are also gratefully appreciated.

The MedicCom device has been developed by a collaboration between the University of Leicester, the University Hospitals of Leicester NHS Trust and engineers from Formula 1 Racing's Project Pitlane (a 'not for profit' group of F1 engineers applying their expertise to public service), Innova Technology, and KTN.

Find out more about MedicCom [here](#).

Members of the KTN Health Team have been very busy during the pandemic and have been actively involved in supporting many companies, clinicians, and academics such as MedicCom and Prof. Coats, as well as supporting collaborations and submissions of several successful proposals to funding organisations to address many key challenges related to Covid-19. To find out more and to get in touch with the team please [click here](#).

Open

We value diversity of opinions, ideas, skills and perspectives.

Creative

We embrace ideas with curious minds and use our insight to uncover opportunity.

Collaborative

We are one team, working together across sectors, people and geographies to drive positive change.

Determined

We are determined to meet challenges with solutions and enable innovators to think and act beyond expectations.

Connecting for
Positive Change



Head Office

KTN
Suite 218 Business Design Centre
52 Upper Street
Islington
London N1 0QH

Telephone: 03333 403251
Email: enquiries@ktn-uk.org
ktn-uk.org
[@KTNUK](https://www.instagram.com/KTNUK)