ASSIGNMENT

on

Two page write-up on 5 Solutions to Covid19 provided by Biomedical Engineers

Submitted by

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Roll No. 21111029 of 2021-25

1st Semester, B.Tech

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1 Purpose of Biomedical Engineering

The role of a Biomedical Engineer includes designing biomedical equipment and devices to aid the recovery or improve the health of individuals. This also includes research of engg., principles and techniques to solve medical and biological problems. It's a role that requires excellent knowledge of computing, biology and engineering, an inventive nature, and good problem solving skills. Like designing a software for running some tests or using A.I for research in drug therapies.

2 Solution during covid-19

2.1 VENTILATORS

Patients who cannot breathe spontaneously need to be put on a ventilator. Ventilators are capable of replacing the breath function. Patients in a very acute state of respiratory syndrome are initially sedated and then prepared for the ventilator. In March 2020, an A.I based software predicted that the UK could have an insufficient number of ventilators to cope with the upsurge of patients in intensive care units (ICU) requiring them. Then this led to the Government launched the Ventilator Challenge, a nation-wide call to industry and fellow enterprises to stand up and provide a helping hand in need of the hour. Ultimately, the need was thankfully less than initially anticipated, the production scale up efforts were sufficient. This remains a fantastic demonstration of what the country's engineering community is capable of when faced with such a challenge.

2.2 PERSONAL PROTECTION EQUIPMENT KIT (PPE)

Covid 19 has indeed surfaced the weakness of the society in medical field. The use of PPE kit and face mask is still the first line of defence specially for the frontline workers. It has various advantages like:- filtering of breathing air, avoid the skin contact, reusable so doesn't affect the environment though being made from plastic . though it comes with a minor con that the hearing impairment patients has to depend heavily on lip reading and the listener's assuring face, which sometimes is not viable in these kits.

2.3 OXYGEN

One of the key parameters for COVID-19 patient is the amount of oxygen in their bloodstream (SpO2), Pulse oximetry is the device used for the specific cause. It works with an optic under the fingers clamp. Modern patient monitors provide many more patient parameters in a very smooth transition from critical technical data to simple understandable parameters.

2.4 PATIENT MONITORING

An essential ICU equipment is the monitoring equipment that keeps track of some of the vitals not only when they are ventilated but also during the recovery phase to ensure the regime of ventilation is optimised for their condition.

2.5 MASKS

A basic face shield covering user's nose and mouth. Surgical masks are Class II medical devices. These masks meet certain fluid barrier and flammability requirements. Surgical masks are also tested for particulate matter and bacterial filtration efficiencies and are considered personal protective equipment(PPE). Air purifying respirators, known as respirators, including (FFRs) such as N95s and surgical N95s, filter at least 95 percent of airborne matter and viruses. They are PPE that tightly fit the face and provide certain efficiency levels to reduce wearer exposure to pathogenic particles in a health care surroundings. They provide the highest level of protection against bacteria and viruses.

3 Conclusion

This pandemic has helped to highlight some of the unseen professions that help to make our health service work, and show the positive impact that Biomedical Engineering in particular can have on people's lives. According to Ian Chell "The recent Covid-19 events will change the face of Biomedical Engineering. Now, when you tell people you are learning about Biomedical Engineering, everybody will be able to relate to what you do as you fix the life-saving ventilators. Biomedical Engineering has suddenly become the most important engineering discipline in the world."