

Designing face shields to protect medical staff

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A doctor wearing the face shield. Credit: The Neuro

The COVID-19 pandemic has created an unprecedented need to provide

personal protective equipment (PPE) for hospital staff. A team of Montreal medical experts has partnered with a 3-D printing company to design and distribute face shields to protect healthcare workers as they treat patients with this life-threatening disease.

"Although we currently have an inventory of protective equipment, we worry that consumption will outstrip supply and deliveries," explained Dr. Avinash Sinha, an anesthesiologist at the McGill University Health Centre. "If, like in Italy, the need for PPE doubles every three days for three weeks, then we will need about 130 times more PPE per day in 3 weeks compared to what we needed on day one."

With this urgency on the healthcare front, Dr. Sinha and Leigh MacIntyre, a Senior Research Project Manager at the The Neuro (Montreal Neurological Institute-Hospital), began sourcing local engineering and manufacturing options to create the face shields that hospitals would urgently require.

On March 24, they contacted Montreal-based 3-D printing company AON3D and, within two hours, AON3D reopened their facility and produced a prototype for preliminary testing by Dr. Sinha. Seventy-two hours later, they had produced two more iterations and delivered the final refined version for use at the Montreal General Hospital on March 29. AON3D has already donated hundreds of units being used within four hospitals in Montreal, with plans to deliver 10,000 more in the coming week, including 700 to The Neuro.

The face shields are specially designed for the needs of medical staff working in close contact with COVID-19 patients, to prevent disease spread during high-risk procedures such as intubations, while still providing them with the mobility and visibility required to do their jobs.

"The dynamic capacity to solve challenges and innovate effective

solutions in a five-day time frame was nothing short of an inspiration. AON3D designed and supplied the face shields that are now being used as an essential part of our PPE during emergency COVID-19 resuscitation," says Dr. Sinha.



The Face Shield. Credit: The Neuro

"Our [healthcare workers](#) are the frontline heroes in this global crisis. I can't properly express the pride I've felt seeing some of our employees pulling unprompted 24 hour shifts to ensure the fleet of 3-D printers at our headquarters is producing PPE to help flatten the COVID-19 curve, and protect those who protect us," said AON3D CEO Kevin Han. "We are working to rapidly ramp up capacity so we can produce more face shields to support more healthcare workers across the country."

The open-source design that AON3D adapted for the effort was created by researchers at Georgia Tech, and they have published [their open source, adapted design files for anyone to use](#). AON3D is also encouraging anyone with manufacturing equipment or 3D printers who would like to start producing face shields to get in touch for support.

Those who need face shields are encouraged to visit [the page AON3D has set up to receive requests](#) and coordinate the production and distribution efforts.

Provided by McGill University

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